DIGITAL TCP/IP Services for OpenVMS

User’s Guide

Order Number: AA-PC27J-TE

January 1999

This book explains the user services available with DIGITAL TCP/IP Services for OpenVMS software.

Revision Information: This is a revised manual.
Operating Systems: OpenVMS Alpha Versions 7.1, 7.2
OpenVMS VAX Versions 7.1, 7.2
Software Version: DIGITAL TCP/IP Services for OpenVMS Version 5.0

Compaq Computer Corporation
Houston, Texas
January 1999

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Preface

The DIGITAL TCP/IP Services for OpenVMS product is Compaq’s implementation of the TCP/IP networking protocol suite and internet services for OpenVMS Alpha and OpenVMS VAX systems.

A layered software product, DIGITAL TCP/IP Services for OpenVMS provides a comprehensive suite of functions and applications that support industry-standard protocols for heterogeneous network communications and resource sharing.

This manual explains how to use the user utilities and commands provided with the DIGITAL TCP/IP Services for OpenVMS product. It assumes that these services have been installed and configured on your OpenVMS system and that you have a basic understanding of the OpenVMS operating system.

Intended Audience

This manual is for OpenVMS users who want to communicate with remote hosts on a private internet or on the worldwide Internet.

New and Changed Features

DIGITAL TCP/IP Services for OpenVMS Version 5.0 provides a new kernel based on the IPv4 kernel ported from DIGITAL UNIX Version 4.0D. ¹

Other new features include:

- Dynamic Host Configuration Protocol (DHCP) that allows the system manager to provide dynamic allocation of IP addresses from a single OpenVMS host.
- Gateway routing daemon (GATED) server and a comprehensive suite of interior and exterior routing protocols that offer advanced routing options.
- Classless Inter-domain routing (CIDR) that allows networks to be built with variable-length subnetworks.
- PathMTU discovery, a mechanism that allows an IP host to determine the most efficient packet size for use on a particular path between the source to the destination host.
- UNIX management utilities to assist with the management of OpenVMS systems in a mixed UNIX and OpenVMS environment.
- New implementations of NTP, SNMP, and BIND.
- Improved online help and a new message database for use with the OpenVMS Help Message utility (MSGHLP).

¹ This kernel is based on Berkeley Software Distribution (BSD) Versions 4.3 and 4.4, and from Compaq Computer Corporation.
Changes to this document include:

- Chapter 2, Working with Files Using File Transfer (FTP) was reorganized for improved readability
- Command examples in all chapters were updated to reflect current and correct command syntax
- The following appendixes have been removed:
  - Finger Error and Status Messages
  - FTP Error and Status Messages
  - Remote (R) Command Error and Status Messages
  - TELNET/TN3270 Error and Status Messages

This information is available on line by using the Help Message utility.

Document Structure

This manual contains seven chapters.

- Chapter 1 introduces the services included in the DIGITAL TCP/IP Services for OpenVMS product and explains how to enter command lines to use these services.
- Chapter 2 explains how to use FTP and provides FTP command descriptions.
- Chapter 3 explains how to use Remote Copy, Remote Login, Remote Shell, and Remote Execute and provides command descriptions.
- Chapter 4 explains how to use TELNET and IBM 3270 model terminal emulation (TN3270, using TELNET) and provides command descriptions.
- Chapter 5 explains how to use SMTP (e-mail) and provides examples.
- Chapter 6 explains how to use LPR/LPD (remote printing) and provides LPR/LPD command descriptions.
- Chapter 7 explains how to use the Finger utility to display information about users on a remote or local host.
## Related Documentation

Table 1 lists the manuals available with this version of DIGITAL TCP/IP Services for OpenVMS.

<table>
<thead>
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<th>Manual</th>
<th>Contents</th>
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<tr>
<td>DIGITAL TCP/IP Services for OpenVMS Release Notes</td>
<td>This text file describes new features and changes to the software including installation, upgrade, configuration, and compatibility information. These notes also describe new and existing software problems and restrictions, and software and documentation corrections. Print this text file at the beginning of the installation procedure and read it before you install DIGITAL TCP/IP Services for OpenVMS.</td>
</tr>
<tr>
<td>DIGITAL TCP/IP Services for OpenVMS Installation and Configuration</td>
<td>This manual explains how to install and configure the DIGITAL TCP/IP Services for OpenVMS layered application product.</td>
</tr>
<tr>
<td>DIGITAL TCP/IP Services for OpenVMS User’s Guide</td>
<td>This manual describes how to use the applications available with DIGITAL TCP/IP Services for OpenVMS such as remote file operations, e-mail, TELNET, TN3270, and network printing. This manual also explains how to use these services to communicate with systems on private internets or on the worldwide Internet.</td>
</tr>
<tr>
<td>DIGITAL TCP/IP Services for OpenVMS Management</td>
<td>This manual describes how to configure and manage the DIGITAL TCP/IP Services for OpenVMS product. Use this manual with the DIGITAL TCP/IP Services for OpenVMS Management Command Reference manual.</td>
</tr>
<tr>
<td>DIGITAL TCP/IP Services for OpenVMS Management Command Reference</td>
<td>This manual describes the DIGITAL TCP/IP Services for OpenVMS management commands. Use this manual with the DIGITAL TCP/IP Services for OpenVMS Management manual.</td>
</tr>
<tr>
<td>DIGITAL TCP/IP Services for OpenVMS ONC RPC Programming</td>
<td>This manual presents an overview of high-level programming using open network computing remote procedure calls (ONC RPC). This manual also describes the RPC programming interface and how to use the RPCGEN protocol compiler to create applications.</td>
</tr>
<tr>
<td>DIGITAL TCP/IP Services for OpenVMS System Services and C Socket Programming</td>
<td>This manual describes how to use the OpenVMS system services and C Socket programming interfaces to develop network-based applications.</td>
</tr>
<tr>
<td>DIGITAL TCP/IP Services for OpenVMS eSNMP Programming and Reference</td>
<td>This manual describes the Extensible Simple Network Management Protocol (eSNMP), the eSNMP application programming interface (API), and how to build additional subagents to manage vendor-specific equipment.</td>
</tr>
</tbody>
</table>

For additional information about the DIGITAL TCP/IP Services for OpenVMS products and services, access the DIGITAL OpenVMS World Wide Web site at the following URL:

http://www.openvms.digital.com

You might find the Internetworking with TCP/IP: Principles, Protocols, and Architecture by Douglas Comer useful if you are looking for a comprehensive overview of the TCP/IP protocol suite.
Terminology

DIGITAL TCP/IP Services for OpenVMS Version 5.0 completes the change initiated several releases ago when the product name changed from "ULTRIX Connection (UCX)" to "DIGITAL TCP/IP Services for OpenVMS." To complete this change, the identifier "UCX" is replaced with "TCPIP" in the following cases:

• Registered product facility code
• Management command prompt
• All messages, examples, and banners
• All product file names and databases
• All logical names, except those retained for compatibility
• All associated product documentation

DIGITAL TCP/IP Services for OpenVMS is used to mean both:
• DIGITAL TCP/IP Services for OpenVMS Alpha
• DIGITAL TCP/IP Services for OpenVMS VAX

The auxiliary server is the DIGITAL TCP/IP Services for OpenVMS implementation of the UNIX internet daemon (inetd).

NFS is the DIGITAL TCP/IP Services for OpenVMS implementation of the NFS protocols, including the NFS server, the NFS client, and PC-NFS.

TN3270 means the TELNET client software that emulates IBM 3270 model terminals.

The term UNIX refers to the DIGITAL UNIX operating system. DIGITAL UNIX is fully compatible with Version 4.3 and Version 4.4 of the Berkeley Software Distribution (BSD).

Host and node both mean a system connected to an internet.

The term Internet refers to the global interconnection of networks, as defined by RFC 1208, which consists of large networks using TCP/IP to provide universal connectivity, reaching the Defense Advanced Projects Research Internet, MILNET, NSFnet, CERN, and many worldwide universities, government research labs, military installations, and business enterprises.

The term internet refers to private interconnected networks that use TCP/IP to connect together and function as one, virtual network.

Acronyms

The following acronyms are frequently used in this manual:

BIND Berkeley Internet Name Domain
FTP File Transfer Protocol
LPD Line Printer Daemon Protocol
LPR Line Printer Protocol
RCP Remote Copy
RExec Remote Executive
RFC Request for Comments
Conventions

All IP addresses in this manual represent fictitious addresses. The following conventions apply to this manual.

<table>
<thead>
<tr>
<th>Convention</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>UPPERCASE TEXT</td>
<td>Indicates names of OpenVMS and DIGITAL TCP/IP Services for OpenVMS commands, options, utilities, files, directories, hosts, and users.</td>
</tr>
<tr>
<td>lowercase special type</td>
<td>Indicates UNIX system output or user input, commands, options, files, directories, utilities, hosts, and users.</td>
</tr>
<tr>
<td>bold text</td>
<td>Indicates a new term.</td>
</tr>
<tr>
<td>italic text</td>
<td>Indicates a variable.</td>
</tr>
<tr>
<td>Return</td>
<td>Indicates that you press the Return key.</td>
</tr>
<tr>
<td>Ctrl/X</td>
<td>Indicates that you press the Control key while you press the key noted by x.</td>
</tr>
<tr>
<td>[]</td>
<td>In command format descriptions, indicates the enclosed element is optional. You can enter as many as you want.</td>
</tr>
<tr>
<td>{}</td>
<td>In command format descriptions, indicates you must enter at least one listed element. For readability, each element is either listed on a separate line or separated by vertical bars (</td>
</tr>
<tr>
<td>. . .</td>
<td>Horizontal ellipsis points in examples indicate additional optional arguments have been omitted.</td>
</tr>
<tr>
<td>. . . .</td>
<td>Vertical ellipsis points indicate omission of items from a code example or display example; the items are omitted because they are not important to the topic being discussed.</td>
</tr>
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Reader’s Comments

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TCP/IP is an open communications standard that enables any connected host to communicate with any other connected host. The DIGITAL TCP/IP Services for OpenVMS product is Compaq’s implementation of TCP/IP for the OpenVMS operating system.

The DIGITAL TCP/IP Services for OpenVMS software allows you to communicate and share resources with remote OpenVMS systems, UNIX systems, and other systems that support the TCP/IP protocol suite and Sun Microsystems’ Network File System (NFS).

The product consists of a number of components that implement various TCP/IP protocols. These components provide remote computing, file transfer, resource sharing, electronic mail, and network services as follows:

### Remote Computing

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TELNET</td>
<td>Log in to a remote host in a network using various options to customize the session, control output from the remote host, and negotiate compatibility differences. To start a TELNET session, enter: &lt;br&gt;$ TELNET</td>
</tr>
<tr>
<td>RCP</td>
<td>Copy files between the local host and a remote host or between two remote hosts. Requests are authenticated on the remote host or hosts using the user name supplied by RCP.</td>
</tr>
<tr>
<td>RLOGIN</td>
<td>Connect to a remote host, which starts an interactive login session. Requests are authenticated on the remote host using the user name supplied by RLOGIN.</td>
</tr>
<tr>
<td>RSH</td>
<td>Connect to a remote host, which executes the command you specify. Requests are authenticated on the remote host using the user name supplied to RSH.</td>
</tr>
<tr>
<td>RSH/PASSWORD</td>
<td>Use the REXEC facility to connect to the remote host, which executes the command you specify. Requests are authenticated on the remote host using the user name and password supplied by RSH.</td>
</tr>
<tr>
<td>RMT/RCD</td>
<td>Access magnetic tape and CD drives on a remote host as though they are available locally.</td>
</tr>
<tr>
<td>Finger</td>
<td>Display information about users logged in to a remote host, such as their login user names or programs they are using.</td>
</tr>
</tbody>
</table>

### File Transfer

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FTP</td>
<td>Create, delete, and copy files and directories between hosts. To start an FTP session, enter: &lt;br&gt;$ FTP</td>
</tr>
<tr>
<td>TFTP</td>
<td>Download and transfer files.</td>
</tr>
</tbody>
</table>
Getting Started

**Resource Sharing**

<table>
<thead>
<tr>
<th>LPD/LPR</th>
<th>Print files on remote and local hosts.</th>
</tr>
</thead>
<tbody>
<tr>
<td>TELNETSYM</td>
<td>Print files on remote hosts using the TELNET protocol.</td>
</tr>
<tr>
<td>NFS</td>
<td>Authenticate requests and provide access to remote files.</td>
</tr>
</tbody>
</table>

**Mail**

<table>
<thead>
<tr>
<th>SMTP</th>
<th>Send and receive electronic mail from remote hosts.</th>
</tr>
</thead>
<tbody>
<tr>
<td>POP</td>
<td>Send and receive electronic mail from your PC.</td>
</tr>
</tbody>
</table>

**Network Services**

<table>
<thead>
<tr>
<th>BIND</th>
<th>Name and address resolution service to distribute and manage host information.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SNMP</td>
<td>Monitor and manage network devices from across an internetwork.</td>
</tr>
<tr>
<td>NTP</td>
<td>Synchronize time between hosts.</td>
</tr>
<tr>
<td>BOOTP</td>
<td>Answer bootstrap requests from remote devices.</td>
</tr>
<tr>
<td>DHCP</td>
<td>Configure and maintain your IP address space including the temporary assignment of IP addresses.</td>
</tr>
<tr>
<td>SLIP, CSLIP</td>
<td>Connect a node to a network over a serial connection using IP.</td>
</tr>
<tr>
<td>PPP</td>
<td>Connect a node to a network using IP or other supported network protocols.</td>
</tr>
</tbody>
</table>

Management commands

- Manage your TCP/IP environment. To start the management control program, enter:
  - `$ TCPIP`
- For online descriptions of the management commands, enter:
  - `$ TCPIP HELP`

<table>
<thead>
<tr>
<th>TCPTTRACE</th>
<th>Trace packets going in and out of the system.</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSLOOKUP</td>
<td>Determine if your local name server is running correctly or retrieve information from remote servers.</td>
</tr>
</tbody>
</table>

Your particular installation may include some or all of the above components. For information about the components available to you, see your system or network manager.

System or network managers are generally authorized to install, configure, and manage the various TCP/IP components on your system. And, as such, many of the TCP/IP components are used primarily by system or network managers and are seldom needed by TCP/IP users. You can find the details of system management components and commands in DIGITAL TCP/IP Services for OpenVMS Management and DIGITAL TCP/IP Services for OpenVMS Management Command Reference.

If you are a TCP/IP user and want to manipulate files on remote systems, send and receive electronic mail, log in to remote systems, or enter commands remotely, this user guide provides the information and commands you need.
1.1 Which Service Do You Use?

Some of the DIGITAL TCP/IP Services for OpenVMS components provide similar capabilities. Table 1–1 helps you determine the best facility to use for your specific needs and indicates where to look for information about that facility.

### Table 1–1 Components to Use for Specific Needs

<table>
<thead>
<tr>
<th>To obtain user information, if you need to...</th>
<th>Use...</th>
<th>Refer to...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Get information about users logged in to a remote host, such as their login user names, current program being used, and last login.</td>
<td>Finger</td>
<td>Section 7.3</td>
</tr>
<tr>
<td>Get information about users logged in to your OpenVMS Cluster.</td>
<td>Finger</td>
<td>Section 7.3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>To copy files, if you need to...</th>
<th>Use...</th>
<th>Refer to...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perform other operations on the files, such as deleting, renaming, appending, and viewing files.</td>
<td>FTP</td>
<td>Section 2.9, Section 2.11, Section 2.10</td>
</tr>
<tr>
<td>Copy multiple files to or from one or more unrelated directories on the remote host.</td>
<td>FTP</td>
<td>Section 2.3.1, Section 2.6, Section 2.8</td>
</tr>
<tr>
<td>Copy every file and subdirectory in a directory on a host, preserving the directory hierarchy.</td>
<td>RCP</td>
<td>Section 3.4</td>
</tr>
<tr>
<td>Create or delete directories, and display the contents of directories.</td>
<td>FTP</td>
<td>Section 2.7, Section 2.5</td>
</tr>
<tr>
<td>Copy files between two remote hosts.</td>
<td>RCP</td>
<td>Section 3.8</td>
</tr>
<tr>
<td>Perform fast file transfers between two OpenVMS hosts.</td>
<td>FTP</td>
<td>Section 2.8.4</td>
</tr>
<tr>
<td>Copy files to and from a remote UNIX system, preserving RMS file attributes.</td>
<td>FTP</td>
<td>Section 2.8.5</td>
</tr>
<tr>
<td>Copy files, preserving the protection mode and modification date.</td>
<td>RCP</td>
<td>Section 3.8</td>
</tr>
<tr>
<td>Copy and work with files using DECnet file specifications.</td>
<td>FTP</td>
<td>Section 2.15</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>To print files, if you need to...</th>
<th>Use...</th>
<th>Refer to...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Send local files to a remote host printer or print queue, using the OpenVMS printing options such as customizing the printed page with special print forms and specifying the number of copies to print.</td>
<td>DCL PRINT</td>
<td>Section 6.1</td>
</tr>
<tr>
<td>Display the status of remote print queue jobs and cancel print jobs in that queue.</td>
<td>LPQ, LPRM</td>
<td>Section 6.2, Section 6.3</td>
</tr>
<tr>
<td>Send remote UNIX files to a local print queue.</td>
<td>lpr†</td>
<td>Section 6.4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>To log in to remote accounts, if you need to...</th>
<th>Use...</th>
<th>Refer to...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Log in to a remote host that runs Remote (R) protocols.</td>
<td>RLOGIN</td>
<td>Section 3.5</td>
</tr>
</tbody>
</table>

†This command must be entered at the remote UNIX host. A queue on your local OpenVMS system must be set up by the system manager to receive the UNIX print jobs. The queue must be identifiable by the UNIX system.
### Table 1–1 (Cont.) Components to Use for Specific Needs

<table>
<thead>
<tr>
<th>To log in to remote accounts, if you need to...</th>
<th>Use...</th>
<th>Refer to...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Log in to a remote host, using many options to customize the session, control output from the remote host, and negotiate compatibility differences.</td>
<td>TELNET</td>
<td>Section 4.10</td>
</tr>
<tr>
<td>Establish multiple, simultaneous login connections with one or more hosts, and toggle between the sessions.</td>
<td>TELNET</td>
<td>Section 4.9</td>
</tr>
<tr>
<td>Log in using IBM 3270 Information System (IDS) terminal emulation with a host that uses IBM 3270 model terminals.</td>
<td>TN3270</td>
<td>Section 4.12</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>To enter remote commands, if you need to...</th>
<th>Use...</th>
<th>Refer to...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enter a command on a remote host, including a command that invokes a remote shell script or command procedure, with any output displayed at your terminal.</td>
<td>RSH, REXEC</td>
<td>Section 3.6, Section 3.7</td>
</tr>
<tr>
<td>Enter a command, without specifying user authentication information, on a remote host that has authentication files.</td>
<td>RSH</td>
<td>Section 3.6</td>
</tr>
<tr>
<td>Enter a command and password to a host that does not have authentication files for you.</td>
<td>RSH/PASSWORD‡</td>
<td>Section 3.7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>To send and receive mail, if you need to...</th>
<th>Use...</th>
<th>Refer to...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Send mail to, and receive mail from, a remote host using SMTP.</td>
<td>MAIL</td>
<td>Chapter 5</td>
</tr>
<tr>
<td>Send and receive OpenVMS mail, at your PC.</td>
<td>MAIL, POP</td>
<td>Section 5.10</td>
</tr>
</tbody>
</table>

‡ Issuing the /PASSWORD qualifier with the RSH command invokes the REXEC facility, which sends the password to the specified remote host.

### 1.1.1 Services for Working with Files

FTP allows you to establish a session with the remote host and enter an unlimited number of commands that copy, display, or manipulate files and directories. The Anonymous FTP feature (See Section 2.3.2) allows you to connect to a remote host without specifying user authentication information. If that feature is not enabled, you must supply user authentication information for a remote host only once: when you first establish the FTP connection with the remote host. FTP allows you to determine or change the working directory on your host and on the remote host, and to perform various other operations on files and directories.

In contrast, RCP is limited to copying files. To copy files, each RCP command that you enter establishes a separate link for each file transfer with the specified remote host. With each RCP command, you must specify the remote host to or from which you want to copy files. As with FTP, RCP has a feature that allows you to connect to remote hosts without specifying user authentication information. However, if that feature is not enabled, you must enter user authentication information with each RCP command, rather than just once (as with FTP) for any number of subsequent commands for a connected host.
1.1.2 Services for Remote Logins

The RLOGIN, TELNET, and TN3270 facilities each allow you to log in to a remote host and enable your terminal to perform as if directly connected to the remote host. Use RLOGIN for simple logins in which you do not require much customization or control of the terminal-to-host interaction. Use TELNET if you want to use its extensive terminal features and controls, or you want to open several terminal sessions with one or more remote hosts. With TELNET's extensive functionality, it can support a wider variety of terminal features and behaviors between disparate, otherwise incompatible, systems.

Use TN3270 to connect your terminal to a remote host that supports IBM 3270 IDS terminals. TN3270 assigns IBM 3270 functions to your DIGITAL keyboard and allows you to redefine keys.

1.1.3 Services for Issuing Commands at a Remote Host

RSH and REXEC allow you to send any commands supported by the remote host operating system. RSH and REXEC issue one command per link. If user authentication is required, you must enter the authentication information with each command. There is no REXEC command. You invoke REXEC when you enter the RSH command with a password (RSH/PASSWORD).

Note that RLOGIN, TELNET, and TN3270 allow you to log in to a remote host once and then perform any number of commands supported by the remote host's operating system. TELNET and TN3270 also allow you to send certain commands to the connected remote host during a terminal session; however, these are a limited range of commands dealing with communication between hosts. They are not operating system commands. For example, you can send a command that aborts output or interrupts execution of a command you entered previously.

1.2 Client/Server Software

The user services include client and server software that communicates between host systems. Your local host includes client software that responds to your commands by requesting the appropriate services from the remote host you specify. If the remote host has the appropriate server software, the server on that host responds with the requested service.

For example, Figure 1–1 shows the interplay between the FTP local client and remote server. The FTP client software requests the FTP server software on Host B to open a connection.
1.2 Client/Server Software

Figure 1–1 FTP Client/Server Software Interacting

1. User MILTON enters an FTP CONNECT command from local host Host A to connect to remote host Host B.

2. The FTP local client sends a connection request to the FTP server on Host B.

3. The remote server grants the request, sending a data connection status message back to the local client.

4. The client displays at user MILTON’s terminal the server connection status message and the remote host prompt for login information.

Once the connection is made, user MILTON can then log onto the remote system and use FTP to copy files and perform other related services. Note that both server and client software exist on each system supporting FTP. Thus, a user on Host B could connect to Host A and copy files back and forth from Host B.

1.3 User Commands

The FTP, TELNET, and TN3270 components include a wider variety of commands than do the other user services.

You can start FTP, TELNET, or TN3270 and connect to a remote host interactively in either of two ways:

- Specify the component name followed by a Return. The utility’s prompt appears, and you can then enter the CONNECT command. For example, to start FTP and connect to a remote host named FATHM, type:

  $ FTP RETURN
  FTP> CONNECT FATHM
  ...
1.3 User Commands

- Specify the utility name and host name in one line, as in the following example:

  $ FTP FATHM

  .

  .

  FTP>

In either case, you are prompted for user authentication information. (FTP includes a feature that allows you to connect to a remote host without specifying user authentication information (See Section 2.3.2).) You can also start these utilities by using a command procedure.

Start the Remote (R) and network printer services by specifying the appropriate command, host name, and parameters or qualifiers in one command line. If you specify the service command only (RCP, RSH, RLOGIN, PRINT, LPQ, or LPRM), the service prompts you for the information required for the command. The PRINT command supports remote printing using TCP/IP protocols and supporting the DCL PRINT qualifiers, with a few exceptions and additional features, as explained in Section 6.1.

When you enter the FINGER command without any host or user information, the service displays information about users on your local system. To display information about remote users, you need to specify the remote host name. For more details and options, see Chapter 7.

To start MAIL and then send a message to a user on another internet host, simply start the OpenVMS Mail utility as you normally do, and use the SEND command with the Internet address of the remote host, such as in the following example. The Mail utility will use the SMTP protocol to send the mail. (See Chapter 5 for details about exceptions and alternatives.)

$ MAIL

MAIL> send

To:  MALCOLM@PHILOS.BU.ORG

Subj:  FINAL EXAMS

1.4 Command Syntax

Use the following rules when you type a command line:

- **DCL and UNIX command formats**
  
  Most command descriptions specify both a DCL-style format and a UNIX style format. You can, therefore, type command lines in either format. For example, the following two command lines achieve the same results:

  TELNET> CONNECT BENTLEY
  
  TELNET> open bentley

- **Keyword abbreviations**
  
  You can abbreviate commands and qualifiers to the fewest number of characters, usually three, that uniquely identifies the keyword. For example, the following two command lines achieve the same results:

  $ RL RENT /USE=BUNNINGS
  
  $ RLOGIN RENT /USER_NAME=BUNNINGS

- **Quotation marks**
Getting Started
1.4 Command Syntax

Due to differences in OpenVMS and UNIX syntax, some command lines require quotation marks for selected keywords. These requirements apply to case sensitivity, slashes, and certain special characters (such as & = and \).

UNIX is case sensitive; UNIX host names, user names, and passwords are usually lowercase. All UNIX directory names contain slashes. For the requirements for individual services, see the discussions about quotation marks in Chapter 7 (Finger utility), Chapter 2 (FTP), Chapter 3 (R commands), Chapter 4 (TELNET, TN3270), Chapter 5 (electronic mail (SMTP)), and Chapter 6 (network printing).

• Names and addresses

Unless otherwise stated, whenever you specify a host on a command line, you can use its host name, a fully qualified domain name, or its IP address. The relative name of a host is a simple name that does not include the fully qualified domain name. That is, it does not include one or more periods (.).

For example, the relative host name VENDOR might have a fully qualified domain name such as VENDOR.GOODS.IGCORP.COM. The following two examples show two ways to enter the TELNET command to connect to host VENDOR at IP address 17.22.3.4.

$ TELNET VENDOR
Trying...17.22.3.4
Connected to VENDOR.
Escape character is ‘^[’.

UNIX V5 (vendor.goods.igcorp.com)
login:

or

$ TELNET 17.22.3.4
Trying...17.22.3.4
Connected to 17.22.3.4.
Escape character is ‘^[’.

UNIX V5 (vendor.goods.igcorp.com)
login:

• File and directory names

When you specify OpenVMS directory names and file names, follow OpenVMS file specification rules, as explained in the OpenVMS documentation. Likewise, when you specify UNIX directory names and file names, follow UNIX file specification rules, as explained in the documentation supplied with the UNIX system.

• Multiple values for parameters

To specify multiple values for command parameters, such as host names and directories, follow these guidelines:

• Separate elements with commas.
• Wildcards are valid.
• A space between multiple elements is optional.

The following FTP GET command copies the files PROJ1.TXT and GROUP1.TXT, using a comma to separate the file names in the command line:

FTP> GET PROJ1.TXT, GROUP1.TXT
The following FTP GET command uses the asterisk (*) wildcard to copy all files starting with the letters "PROJ 1":

FTP> GET PROJ1*.*

• **Multiple values for qualifiers**
To specify multiple values for qualifiers, enclose them in parentheses as follows:

/qualifier=(value1,value2,value3)

For example, the following LPRM command deletes three jobs from a remote print queue:

$ LPRM EST_4_1997_Q /ENTRY=(555,556,558)

• **Numeric values**
Unless stated otherwise, all values are decimal.

• **Brackets and braces**
Command format descriptions in this manual include elements that are enclosed by braces and brackets. You should understand the meaning of the braces and brackets:

• Braces ( {} ) — You must specify at least one of the enclosed values. Occasionally, you may need to specify all of the enclosed values (this case is always noted).

  **Example 1:** This example shows the format line for the FTP SET DEFAULT command. The choices for the directory specification parameter are enclosed in braces, which means that you must specify one of these values (either an OpenVMS directory name or a UNIX path name).

  FTP> SET DEFAULT /LOCAL
      {vms_directory_name}
      {unix/path/name}

  **Example 2:** In this TELNET example, you must specify either CHAR or LINE.

  TELNET> SET MODE {CHAR} {LINE}

• Brackets ([ ]) — The enclosed values are optional.

  **Example 1:** The last two parameters for the TELNET CONNECT command are enclosed in brackets, which means they are optional. In this example, the port can be specified without a terminal type, and the host without a port.

  TELNET> CONNECT host [ port [terminal_type ] ]

  **Example 2:** The format of the RSH command shows that all the qualifiers and the remote_command parameter are optional.

  $ RSH host
     [ /EIGHTBIT ]
     [ /ESCAPE_CHARACTER=character ]
     [ /LOG_FILE=file ]
     [ /NO]LOWERCASE ]
     [ /PASSWORD=password ]
     [ /NO]SYSERROR ]
     [ /TERMINAL_SPEED=n ]
1.5 Online Help

You can access most of the introductory material in this manual on line by entering:

$ HELP TCPIP_Services

Options under this heading include introductory information about the following TCP/IP services:

$ HELP TCPIP_Services

Additional information available:

<table>
<thead>
<tr>
<th>Product_Overview</th>
<th>BIND</th>
<th>BOOTP</th>
<th>DHCP</th>
<th>TFTP</th>
<th>NTP</th>
</tr>
</thead>
<tbody>
<tr>
<td>SNMP</td>
<td>NFS</td>
<td>SLIP_and_PPP</td>
<td>Management_Tools</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UNIX_Commands</td>
<td>Routing</td>
<td>Command_Syntax</td>
<td>NSLOOKUP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Programming_Interfaces</td>
<td>Finger</td>
<td>FTP</td>
<td>SMTP</td>
<td>POP</td>
<td></td>
</tr>
<tr>
<td>LPR_LPD</td>
<td>Remote_Commands</td>
<td>TELNET</td>
<td>RPCGEN</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In addition to this overview information, you can access help on a number of specific TCP/IP commands directly at the DCL prompt by typing any of the following:

$ HELP FINGER
$ HELP FTP
$ HELP LPQ
$ HELP LPRM
$ HELP PRINT
$ HELP RCP
$ HELP REXEC
$ HELP RLOGIN
$ HELP RSH
$ HELP TELNET
$ HELP TN3270

Because TELNET, FTP, and the management commands generate their own system prompts, you need to go to their prompts to get help with specific commands:

- **FTP**

  $ FTP
  
  FTP> HELP

  Information available:

  APPEND CONNECT CREATE DELETE DIRECTORY DISABLE
  DISCONNECT ENABLE EXIT GET HELP LOGIN PUT
  QUOTE RENAME SET SHOW SPAWN VIEW

- **TELNET**
$ TELNET
TELNET> HELP

Information available:
BIND_SESSION CONNECT CREATE_SESSION DELETE_SESSION
DISABLE DISCONNECT ENABLE EXIT HELP RESUME SEND
SET SHOW SPAWN TN3270 UNBIND_SESSION

• Management Commands

$ TCPIP
TCPIP> help

Information available:
About... ADD ANALYZE Anonymous_FTP arp CONVERT
COPY CREATE DEFINE DELETE DIRECTORY DISABLE
DISCONNECT DISMOUNT ENABLE EXIT EXPORT GENERATE HELP
ifconfig IMPORT LIST LOOP MAP MOUNT netstat
NFS PING REMOVE ripqury route SEND SET
SHOW START STOP sysconfig TCPIP_Prompt TCPCRACE
UNMAP ZERO
The DIGITAL TCP/IP Services for OpenVMS software includes the File Transfer Protocol (FTP) service. The FTP Protocol allows the transferring of data between hosts that use dissimilar file systems. The FTP command is the interface to the File Transfer Protocol and provides commands to:

- List remote directories
- Change the current local and remote directory
- Transfer multiple files in a single request
- Create and remove directories
- Provide security by sending passwords to a remote host
- Permit automatic login, file transfer, and log off
- Preserve RMS file attributes

FTP does not allow recursive copying. You can use the RCP command, if you need this function.

**What You Need**

To use FTP, you need the following:

- A user account on the OpenVMS system with access to DIGITAL TCP/IP Services for OpenVMS
- One of the following:
  - A user account on the remote FTP host
  - Access to the remote host’s ANONYMOUS user account (See Section 2.3.2)

**What You Can Do**

The following table lists the FTP file services and the sections that explain how to use them.

<table>
<thead>
<tr>
<th>Capability</th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enter either DCL-style or UNIX style command syntax</td>
<td>2.1</td>
</tr>
<tr>
<td>Customize the way FTP processes commands and file transfers</td>
<td>2.13</td>
</tr>
<tr>
<td>Display all FTP commands sent to the remote host during command processing</td>
<td>2.13</td>
</tr>
<tr>
<td>Display all replies from the remote host during command processing</td>
<td>2.13</td>
</tr>
<tr>
<td>Gain access to OpenVMS files without specifying your user name or a password</td>
<td>2.3.2</td>
</tr>
<tr>
<td>Use either OpenVMS or UNIX command syntax in command procedures that use FTP</td>
<td>2.14</td>
</tr>
</tbody>
</table>
Working with Files Using File Transfer (FTP)

Capability | Section
--- | ---
Set and display the default (working) directory on the local or remote host | 2.6
Create and delete remote directories | 2.7
View remote directories | 2.5
Delete a remotefile | 2.9
Rename a remote file | 2.9
Append a local file to a remote file | 2.11
Display the contents of a file on a remote host | 2.10
Copy files from a connected remote host to your local host | 2.8.1
Copy files from your local host to the connected remote host | 2.8.2
Preserve OpenVMS file attributes when copying files to a UNIX system and back again | 2.8.5
Copy files to and from a DECnet node | 2.15
Suspend FTP to spawn a subprocess at the DCL prompt | 2.12

Command Summary

To use FTP, enter the commands summarized in Table 2-1 (for complete command descriptions see Section 2.16).

Table 2-1  FTP Commands: Summary

<table>
<thead>
<tr>
<th>DCL-Style Command</th>
<th>Equivalent UNIX Style Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Starting and Exiting (At the DCL Prompt)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FTP</td>
<td>ftp</td>
<td>Invokes FTP</td>
</tr>
<tr>
<td>FTP remote_host</td>
<td>ftp remote_host</td>
<td>Invokes FTP and establishes a connection to a remote host</td>
</tr>
<tr>
<td><strong>Starting and Exiting (At the FTP&gt; Prompt)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CONNECT</td>
<td>open</td>
<td>Establishes a connection to a remote host</td>
</tr>
<tr>
<td>DISCONNECT</td>
<td>close</td>
<td>Closes the connection with the remote host</td>
</tr>
<tr>
<td>EXIT</td>
<td>quit</td>
<td>Closes the connection with the remote host and exits FTP</td>
</tr>
<tr>
<td>Ctrl/Z</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

2-2  Working with Files Using File Transfer (FTP)
Table 2–1 (Cont.) FTP Commands: Summary

<table>
<thead>
<tr>
<th>DCL-Style Command</th>
<th>Equivalent UNIX Style Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sending Commands to the Remote Host</td>
<td></td>
<td></td>
</tr>
<tr>
<td>APPEND</td>
<td>append</td>
<td>Concatenates a local file to a remote file</td>
</tr>
<tr>
<td>CREATE/DIRECTORY</td>
<td>mkdir</td>
<td>Creates a remote directory</td>
</tr>
<tr>
<td>DELETE</td>
<td>delete</td>
<td>Deletes remote files</td>
</tr>
<tr>
<td></td>
<td>mdelete</td>
<td></td>
</tr>
<tr>
<td>DIRECTORY</td>
<td>ls</td>
<td>Lists remote file names and related information</td>
</tr>
<tr>
<td>GET</td>
<td>get</td>
<td>Copies files from the remote host to the local host</td>
</tr>
<tr>
<td></td>
<td>mget</td>
<td></td>
</tr>
<tr>
<td>LOGIN</td>
<td>user</td>
<td>Logs you in to a remote host</td>
</tr>
<tr>
<td>PUT</td>
<td>put</td>
<td>Copies files from the local host to the remote host</td>
</tr>
<tr>
<td></td>
<td>mput</td>
<td></td>
</tr>
<tr>
<td>RENAME</td>
<td>rename</td>
<td>Changes file name(s) on remote systems</td>
</tr>
<tr>
<td>SET DEFAULT</td>
<td>cd</td>
<td>Sets the remote working directory or the local working directory</td>
</tr>
<tr>
<td></td>
<td>lcd</td>
<td></td>
</tr>
<tr>
<td>SHOW DEFAULT</td>
<td>pwd</td>
<td>Displays the name of the remote current working directory or the local working directory</td>
</tr>
<tr>
<td></td>
<td>lpwd</td>
<td></td>
</tr>
<tr>
<td>VIEW</td>
<td>view</td>
<td>Displays the contents of a file on the current output device</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Suspending FTP to Return to DCL Prompt</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>SPAWN</td>
<td>!</td>
<td>Suspends FTP to create a subprocess at the local DCL prompt</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Customizing Your Session’s Environment</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>DISABLE LOG</td>
<td>debug†</td>
<td>Disables the display of all the protocol commands sent to the remote host</td>
</tr>
<tr>
<td>DISABLE PARSE</td>
<td>glob†</td>
<td>Disables the expansion of file names</td>
</tr>
<tr>
<td>DISABLE PORT_COMMAND</td>
<td>sendport†</td>
<td>Disables the sending of the FTP protocol PORT command</td>
</tr>
<tr>
<td>DISABLE REPLY</td>
<td>N/A</td>
<td>Disables the display of all responses from the remote host</td>
</tr>
<tr>
<td>DISABLE TRANSFER_VERIFICATION</td>
<td>hash†</td>
<td>Disables the display of # for each 1K bytes of data transferred</td>
</tr>
<tr>
<td>DISABLE VMS_PLUS</td>
<td>N/A</td>
<td>Disables the special OpenVMS-to-OpenVMS transfer mode</td>
</tr>
<tr>
<td>ENABLE LOG</td>
<td>debug†</td>
<td>Enables the display of protocol commands sent to the remote host</td>
</tr>
<tr>
<td>ENABLE PARSE</td>
<td>glob†</td>
<td>Enables the expansion of file names</td>
</tr>
<tr>
<td>ENABLE PORT_COMMAND</td>
<td>sendport†</td>
<td>Enables the sending of the FTP protocol PORT command</td>
</tr>
</tbody>
</table>

†This command toggles the value between enabled and disabled.
Table 2–1 (Cont.) FTP Commands: Summary

<table>
<thead>
<tr>
<th>DCL-Style Command</th>
<th>Equivalent UNIX Style Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENABLE REPLY</td>
<td>N/A</td>
<td>Enables the display of responses from the remote host</td>
</tr>
<tr>
<td>ENABLE TRANSFER_VERIFICATION</td>
<td>hash†</td>
<td>Enables the display of # for each 1K bytes of data transferred</td>
</tr>
<tr>
<td>ENABLE VMS_PLUS</td>
<td>N/A</td>
<td>Enables the special OpenVMS-to-OpenVMS transfer mode</td>
</tr>
<tr>
<td>HELP</td>
<td>?</td>
<td>Invokes help</td>
</tr>
<tr>
<td>QUOTE</td>
<td>quote</td>
<td>Sends FTP commands to the remote host without local interpretation</td>
</tr>
<tr>
<td>SET TYPE</td>
<td>type</td>
<td>Defines the data representation for file transfers</td>
</tr>
<tr>
<td>SHOW STATUS</td>
<td>status</td>
<td>Displays the current FTP parameter settings and, if you have an open connect, the name of the connected host</td>
</tr>
<tr>
<td>SPAWN</td>
<td>!</td>
<td>Starts up a subprocess at the DCL prompt</td>
</tr>
</tbody>
</table>

†This command toggles the value between enabled and disabled.

2.1 Typing FTP Commands

Use the following rules for command syntax, quotation marks, and wildcards when you type FTP command lines.

2.1.1 DCL and UNIX Command Formats

With the FTP command and most of the commands at the FTP prompt, you can use either DCL-style or UNIX style syntax. For example, the DCL-style DIRECTORY and UNIX style ls commands produce the same results, as shown in the following example:

```
FTP> DIRECTORY/BRIEF *.DIR
200 PORT command successful.
150 Opening data connection for WORK1$:[VANA]*.DIR;* (130.180.4.8,1797)
BIN.DIR;1
MAIL.DIR;1
NEWS.DIR;1
NSLOOKUP.DIR;1
USER.DIR;1
226 NLST Directory transfer complete
63 bytes received in 00:00:00.02 seconds (2.12 Kbytes/s)
```

```
FTP> ls *.dir
200 PORT command successful.
150 Opening data connection for WORK1$:[VANA]*.DIR;* (130.180.4.8,1798)
BIN.DIR;1
MAIL.DIR;1
NEWS.DIR;1
NSLOOKUP.DIR;1
USER.DIR;1
226 NLST Directory transfer complete
63 bytes received in 00:00:00.03 seconds (2.05 Kbytes/s)
```

FTP>
2.1.2 Quotation Marks

When you communicate with a non-OpenVMS host, you need to enclose the following with quotation marks:

- UNIX path names
- UNIX file names with slashes
- Lowercase or mixed-case host names, user names, passwords, file names, and command lines

In the following example, UNIX path names need quotation marks around them:

```
FTP> put MY.DOC "/usr/users/evt/my.doc"
200 PORT command successful.
150 Opening ASCII mode data connection for /usr/users/evt/mydoc (130.180.4.8,1789).
226 Transfer complete.
local: WORK1$:[VANA]MY.DOC;2 remote: /usr/users/evt/my.doc
289 bytes sent in 00:00:00.01 seconds (20.15 Kbytes/s)
```

2.1.3 Wildcards

You can use wildcards in the following FTP commands: DELETE, DIRECTORY, GET, PUT, MGET, MPUT, MDELETE, and MLS.

The wildcard characters recognized by FTP are:

- The percent sign (%) to represent an individual character
- The question mark (?) to represent an individual character
- The asterisk (*) to represent multiple characters

If any of these characters are part of a file name (not used as a wildcard), you can disable recognition of these characters as wildcards by either enclosing the file name in quotation marks or using the DISABLE PARSE command.

2.1.4 Qualifiers

In a DCL-style command line, you can place a command qualifier anywhere on the command line. It is a good practice to follow the OpenVMS recommendation to place the qualifier after the command name.

In the following example, all three forms of the GET command are correct.

```
FTP> GET TEMP. *.* /CONFIRM
FTP> GET /CONFIRM TEMP. *.*
FTP> GET/CONFIRM TEMP. *.*
```

Get TEMP. ? [Y or N ] [Y]:Y
200 TYPE set to IMAGE.
200 PORT command successful.
150 Opening data connection for TEMP. (130.180.4.8,2634)
226 Transfer complete.
local: WORK10:[MILGROM]TEMP.;13 remote: TEMP.
153 bytes received in 00:00:00.01 seconds (9.33 Kbytes/s)

1. The /CONFIRM qualifier follows the file name parameters rather than the GET command.
2. The /CONFIRM qualifier follows the GET command, but with a space between the command and the qualifier.
2.1 Typing FTP Commands

3. The /CONFIRM qualifier immediately follows the GET command. FTP prompts the user to confirm that file TEMP. is to be copied and then sends a copy of the file from the remote host.

2.2 Obtaining Online Help

You can obtain online help for the FTP utility and FTP commands by typing any one of the following commands:

- At the DCL prompt:

  $ HELP TCP/IP_SERVICES FTP
  $ HELP FTP

- At the FTP prompt:

  FTP> HELP

  Information available:

  APPEND   CONNECT   CREATE   DELETE   DIRECTORY   DISABLE
  DISCONNECT   ENABLE   EXIT   GET   HELP   LOGIN   PUT
  QUOTE   RENAME   SET   SHOW   SPAWN   VIEW

  Topic?

  FTP>

- Also, at the FTP prompt:

  FTP> ?

  Commands may be abbreviated. Commands are:

  append   disconnect   mdir   remotehelp   view
  ascii   form   mls   rename   view/p
  bell   mode   reset   view/pa
  binary   glob   mput   rmdir   view/pag
  bye   hash   open   rstatus   view/page
  case   image   prompt   send   vms
  cd   lcd   sendport   status   ?
  cdup   ls   put   struct   !
  close   lpwd   pwd   sunique
  delete   mdelete   quit   type
  debug   mkdir   quote   user
  dir   mget   recv   verbose

  FTP>

To obtain information about a specific command, specify the command as in the following examples:

- Using DCL-style commands:

  FTP> HELP SET

  SET

  Additional information available:

  DEFAULT   ERROR_LEVEL   TYPE

  SET Subtopic?
2.2 Obtaining Online Help

- Using UNIX style commands:

  FTP> ? glob
  glob toggle metacharacter expansion of localfile names
  FTP> ? open
  open connect to remote ftp
  FTP>

2.3 Starting FTP Sessions

You can start an FTP session in any of the following ways:

- At the DCL prompt, enter the FTP command and specify a remote host.
- At the DCL prompt, enter the FTP command with no parameters.
  At the FTP prompt, enter the CONNECT or open command, specifying a remote host.
- By using the /FTP qualifier on the DCL COPY and DIRECTORY commands.
- Invoke and use FTP from a command procedure (Section 2.14).

You must connect to a remote host before you can enter an FTP command that affects or displays files on the remote host. You can invoke FTP and, without connecting to a remote host first, enter the FTP commands that customize the FTP environment.

2.3.1 Making a Remote Connection

When you establish an FTP connection, the remote user name defaults to your user name on the local system.

If you have a different user name on the remote system, do one of the following:

- On the FTP command line, enter the /USERNAME qualifier.
- At the user name prompt, type your remote user name, for example:

  $ FTP SITE1
  220 site1.midwest.billing.bench.com FTP server (Version 5.0) ready
  Connected to SITE1.midwest.billing.bench.com.
  Name (SITE1:antel): crowe
  331 Username CROWE requires a Password
  Password: [Return] password not echoed
  230 User logged in

If your connection is with another OpenVMS host, it executes your LOGIN.COM procedure. You can use your LOGIN.COM command procedure to customize the environment for your FTP sessions.

The following example connects to host XENO using the FTP command:

  $ FTP XENO /USER="bennings" /PASSWORD="keysimpl"
  220 xeno FTP Server (Digital UNIX Version 5.60) ready
  Connected to XENO.site1.acctg.com.
  230 User logged in
  FTP>

In the following example, user dave invokes FTP and connects to UNIX host sanfran using the CONNECT command:
2.3 Starting FTP Sessions

2.3.2 Anonymous User Access (Anonymous FTP)

Anonymous user access, also called Anonymous FTP, lets you make an FTP connection to a remote host by specifying the name ANONYMOUS (or another name defined by the system manager). With Anonymous FTP, you do not need:

• A registered user account on the remote host
• To use your own user account, if you have one
• To supply a password

With Anonymous FTP, you can:

• View remote directories
  – View the guest and public directories with the FTP DIRECTORY command.
  – The public directory called GUEST$PUBLIC has general bulletin-board information. It contains files of interest to FTP users.
• Copy files
  – Enter GET and PUT commands to copy files to and from GUEST$PUBLIC.
  – The public area is read-only. You can enter the GET command to copy files from the remote host to your local system.

Optionally, there is an ANONYMOUS$USER directory where you can:

– Delete files
– Create directories
– Delete directories
– Rename files
– Rename directories

The system manager sets up the access restrictions for Anonymous FTP. How the manager does this determines the availability of features.

In the following example, UNIX user williams uses Anonymous FTP to connect to the ANONYMOUS account on OpenVMS host TRACTPLAN. Rather than prompting for a password, TRACTPLAN asks for the user name.

% ftp tractplan
Connected to tractplan.green_dev.org.
220 tractplan FTP Server (Version 5.0) ready
Name (tractplan:williams): anonymous
331 Guest login ok, send ident as password
Password: williams@tractplan.edu
230 Guest login ok, access restrictions apply
2.4 Exiting FTP

You can end an FTP session and return to the DCL prompt with any of the following commands: EXIT, quit, or Ctrl/Z. The following examples close the connection with the remote host, if one is open, and exit FTP.

```
FTP> EXIT
221 Goodbye.
$
```

```
FTP> quit
221 Goodbye.
$
```

If however, you want to close a connection while remaining at the FTP prompt, use the DISCONNECT or close command.

The following examples close a connection, if one is open, and remain at the FTP prompt for you to continue using FTP.

```
FTP> DISCONNECT
221 Goodbye.
FTP>
```

```
FTP> CLOSE
221 Goodbye.
FTP>
```

2.5 Viewing Directories on the Remote Host

Use the DIRECTORY command to list the files and associated information in remote directories. For example, the following command lists the files in the default directory on a remote UNIX host (assuming the user already has connected to the remote host):

```
FTP> DIRECTORY
200 PORT command successful
150 Opening ASCII mode data connection for /bin/ls (130.180.4.8,1312)
total 6303
-rw-rw-r--  1 milgrom users  1 Jan 9 1996 #UNTITLED#
-rw-------  1 milgrom users  4 Apr 11 1996 .Xauthority
-rw-r-xr-x  1 milgrom users 1499 Feb 3 1995 .cshrc
drwxr-xr-x 11 milgrom users  8192 Jan 9 1996 .dt
-rw-r-xr-x  1 milgrom users  3970 Dec 13 1995 .dtprofile
```

2.6 Displaying and Changing the Default Directory

During an FTP session, you can display or change the current default directory either on the remote host or on your local host.

To display the default (working) directory on the remote host, use the SHOW DEFAULT command as in the following example:

```
FTP> SHOW DEFAULT
257 "/usr/users" is the current directory.
```
Working with Files Using File Transfer (FTP)

2.6 Displaying and Changing the Default Directory

To display the working directory on the local host, use the SHOW DEFAULT command with the /LOCAL qualifier, as in the following example:

```
FTP> SHOW DEFAULT/LOCAL
Local directory is DISK$6:[MANAGER].
```

To change the default directory on the remote host, use the SET DEFAULT command. The following example shows how to change the default directory on a remote DIGITAL UNIX host to /usr/users/robert:

```
FTP> SET DEFAULT "/usr/users/robert"
250 CWD command successful.
```

or

```
FTP> SET DEFAULT "-robert"
```

To change back to your login default directory, specify a tilde (\~\) alone, as follows:

```
FTP> SET DEFAULT ~
250 CWD command successful.
FTP> pwd
257 "/usr/users/robert" is current directory.
```

This next example changes the remote working directory from /usr/flyers/localads to /usr/flyers/localads/music:

```
FTP> SET DEFAULT MUSIC
```

To change the default directory on your local host, use the SET DEFAULT command with the /LOCAL qualifier. The following example sets the local default directory to USER$1:[PLANS.CHECKS]:

```
FTP> SET DEFAULT/LOCAL USER$1:[PLANS.CHECKS]
Local Directory now USER$1:[PLANS.CHECKS]
```

This next example changes the local OpenVMS default directory down one level from [DECK] to [DECK.HEARTS]:

```
FTP> SET DEFAULT/LOCAL [.HEARTS]
```

2.7 Creating and Deleting Directories

To create a directory on a connected remote host, use the CREATE/DIRECTORY command. The following command example creates a subdirectory LOCAL_ACCTS in the current working directory on the connected remote OpenVMS host.

```
FTP> CREATE/DIRECTORY [.LOCAL_ACCTS]
```

To delete a directory, use the DELETE/DIRECTORY command as in the following example. The command deletes the directory created in the preceding example.

```
FTP> DELETE/DIRECTORY LOCAL_ACCTS.DIR;*
```

2.8 Copying Files

To copy files from a remote host to your local host, use the GET command. To copy files from your local host to a remote host, use the PUT command. To use these commands, you must have an active FTP session with a remote host. You can enter any number of commands during the session. For information on using these commands to copy files to and from a remote DECnet host, see Section 2.15. You can also use the COPY/FTP command to copy files across the network using
TCP/IP. For more information on this command, type HELP COPY/FTP at the DCL prompt.

2.8.1 Using the GET Command to Copy Remote Files to the Local Host

Use the GET command to copy one or more files from a remote host to your local host. For example, to copy the UNIX file `acct.pay`, located in the remote working directory, to your local OpenVMS host, use the following command:

```
FTP> GET ACCT.PAY
```

**Figure 2–1 The GET Command**

As shown in Figure 2–1:

1. The user at the local host named Host A, and connected through FTP to the remote UNIX host named `hostx`, enters a GET command.
2. The FTP client software on Host A sends a request to the remote FTP server on `hostx` to send the requested file.
3. The FTP PORT command successful message and the following line indicate the remote server is opening a data connection to send the requested file.
4. The remote FTP server sends the requested file, `acct.pay`, to Host A.
5. A message indicates the file transfer was complete and provides additional information about the transfer.

For more information on the GET command, see Section 2.16.
2.8.2 Using the PUT Command to Copy Local Files to the Remote Host

Use the PUT command to copy one or more files from your local host to a remote host. For example, the following command copies the local file ACCTS.LIS to a connected remote UNIX host. Use the /FDL qualifier to prevent record attributes from being lost in the transfer from OpenVMS to UNIX systems. For more information on the /FDL qualifier, see Section 2.8.5.

```
FTP> PUT ACCTS.LIS
```

As shown in Figure 2–2,

1. The user at local host Host A, and connected through FTP to the remote UNIX host hostx, enters a PUT command.
2. The FTP client software on Host A requests the FTP server on hostx to receive the specified file (accts.lis).
3. The remote FTP server establishes a data connection with the local host.
4. The PORT command successful message and the following line indicate the remote server will receive the file.
5. The client sends the requested file, accts.lis, to hostx.
6. A message indicates the file transfer is complete and provides additional information about the transfer.

For more information on the PUT command, see Section 2.16.

---

Figure 2–2 The PUT Command

![Diagram of PUT command sequence](image-url)
2.8.3 How FTP Copies Files

FTP resolves the differences between UNIX file systems and OpenVMS file systems automatically. By default, the PUT command copies files to UNIX systems using lowercase file names without version numbers. If you use a wildcard to copy all versions of a file and do not specify an output file:

- The version numbers become the last element of the copied files.
- Semicolons are converted to periods.

2.8.3.1 Store Unique

The Store Unique (STOU) feature allows you to control how file version numbers are treated when you copy (PUT) files from local to remote hosts. After connecting to the remote host, you toggle the Store Unique feature on and off by issuing the `sunique` command at the FTP prompt, as follows:

```plaintext
FTP> sunique
Store unique on.
FTP> sunique
Store unique off.
FTP> sunique
Store unique on.
```

The Store Unique feature behaves differently when copying files from OpenVMS to UNIX or from UNIX to OpenVMS. It also behaves differently if you use wildcards or specify version numbers. For example, the results vary when you copy the file `text.txt` as follows:

<table>
<thead>
<tr>
<th>FTP Command</th>
<th>Store Unique On</th>
<th>Store Unique Off</th>
</tr>
</thead>
<tbody>
<tr>
<td>From OpenVMS to UNIX</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FTP&gt; PUT text.txt</td>
<td>text.txt</td>
<td>text.txt</td>
</tr>
<tr>
<td>FTP&gt; PUT text.txt;1</td>
<td>text.txt.1</td>
<td>text.txt.1.1</td>
</tr>
<tr>
<td>FTP&gt; PUT text.txt;*</td>
<td>text.txt.1</td>
<td>text.txt.1.1</td>
</tr>
<tr>
<td></td>
<td>text.txt.2</td>
<td>text.txt.2.1</td>
</tr>
<tr>
<td></td>
<td>text.txt.3</td>
<td>text.txt.3.1</td>
</tr>
</tbody>
</table>

2.8.4 Transfers Between OpenVMS Hosts: VMS Plus Mode

FTP performs fast file transfers between two OpenVMS systems (VMS Plus Mode).

When FTP identifies file transfers between two OpenVMS hosts running DIGITAL TCP/IP Services for OpenVMS, it transfers files in large blocks, rather than small records. VMS Plus Mode greatly increases the transfer speed and preserves all Record Management Services (RMS) file attributes.

FTP automatically disables VMS Plus Mode when your session is with a UNIX host or another OpenVMS host not running DIGITAL TCP/IP Services for OpenVMS.
2.8 Copying Files

2.8.5 Preserving OpenVMS File Attributes

When you transfer OpenVMS files to a UNIX system and back again, some record attributes might be lost. To preserve all RMS file attributes, use the /FDL qualifier (File Definition Language) with the GET and PUT commands.

You may also need to use the SET TYPE command to determine the type of file transfer:

- Specifying SET TYPE ASCII results in a sequential file with variable records. Select this type when transferring ASCII text files.
- Specifying SET TYPE IMAGE results in a sequential file with fixed records of 512 bytes. Select this type when transferring non-ASCII files such as binary files or executable image files.

For example, to transfer an executable image to a remote UNIX host, follow these steps:

1. Specify the IMAGE data type:

   FTP> SET TYPE IMAGE

2. Transfer the file to the remote host while at the same time creating and transferring a secondary file with the file's OpenVMS record attributes:

   FTP> PUT/FDL file

To retrieve the file from the remote UNIX host, follow these steps:

1. Specify the IMAGE data type:

   FTP> SET TYPE IMAGE

2. Retrieve the file from the remote host after retrieving and using the secondary file containing the file's OpenVMS record attributes:

   FTP> GET/FDL file.dat

In this example, the PUT/FDL command does the following:

- Creates the FDL file cygnet.bckfdl on the remote host with the RMS attributes of file STAT.BCK.
- Transfers the data in STAT.BCK and puts it in to cygnet.bckfdl on the remote host.

   FTP> PUT/FDL STAT.BCK CYGNET.BCK
   200 TYPE set to ASCII
   200 PORT command successful
   150 Opening data connection for cygnet.bckfdl (130.180.4.8,1028)
   226 Transfer complete
   local: cygnet.bckfdl  remote: cygnet.bckfdl
   846 bytes sent in 00:00:00.03 seconds
   200 TYPE set to IMAGE
   200 PORT command successful
   150 Opening data connection for cygnet.bck (130.180.4.8,1029)
   226 Transfer complete
   local: STAT.BCK  remote: cygnet.bck
   8152 bytes sent in 00:00:00.12 seconds

In this final example, the GET/FDL command does the following:

- Transfers the FDL file cygnet.bckfdl from the remote host to the local host.
• Uses this file to re-create the file STAT.BCK, with all of its original RMS attributes, on the local host.

• Transfers the data in cygnet.bck and puts it in to the new local file STAT.BCK.

```
FTP> GET/FDL CYGNET.BCK STAT.BCK
200 TYPE set to ASCII
200 PORT command successful
150 Opening data connection for cygnet.bckfdl (130.180.4.8,1028)
226 Transfer complete
local: cygnet.bckfdl remote: cygnet.bckfdl
846 bytes sent in 00:00:00.03 seconds
200 TYPE set to IMAGE
200 PORT command successful
150 Opening data connection for cygnet.bck (130.180.4.8,1029)
226 Transfer complete
local: STAT.BCK remote: cygnet.bck
8152 bytes sent in 00:00:00.12 seconds
FTP>
```
2.11 Appending Files

The FTP APPEND command allows you to concatenate a local file to a file on a connected remote host. The following command appends local file JUL_DEC.DAT to file YEAR.DAT on remote host KALI. (A connection has already been established to the remote host.)

```
FTP> APPEND JUL_DEC.DAT YEAR.DAT
200 PORT command successful
150 Opening data connection for year.dat. (130.180.4.8,1108)
226 Append transfer complete
local:large.txt  remote:remote.dat
15596 bytes sent in 00:00:00.10 seconds (152.30 Kbytes/s)
```

2.12 Suspending FTP to Return to the Local DCL Prompt

While using FTP, you can:

- Use the SPAWN command to suspend your current session and create a subprocess at the local DCL prompt. At the DCL prompt, you can then enter any number of DCL commands. To return to your suspended FTP session (exiting the DCL subprocess), enter the LOGOUT command.

```
FTP> SPAWN
$ DIR
Directory WORK1$:[VANA.FTP]
TELNETINIT.INI;2  TELNETINIT.INI;1
Total of 2 files.
$ SHOW TIME
2-OCT-1998 13:16:32
$ LOGOUT
Process VANA_1 logged out at 2-OCT-1998 13:16:48.26
FTP>
```

- Specify a DCL command in the SPAWN command line. After the DCL command executes, FTP prompts for further input.

```
FTP> SPAWN DIR
Directory WORK1$:[VANA.FTP]
TELNETINIT.INI;2  TELNETINIT.INI;1
Total of 2 files.
FTP>
```

- Use the ! character to spawn a new process to execute a command.

```
FTP> ! DIR
Directory WORK1$:[VANA.FTP]
TELNETINIT.INI;2  TELNETINIT.INI;1
Total of 2 files.
FTP>
```
2.13 Customizing FTP Command Processing

You can modify the way FTP transfers files, depending on:

- The operating system of the remote host
- The applications you use
- Whether you want wildcard name expansion
- The information you want displayed during processing

A few of the FTP commands that control FTP command processing are:

- **ENABLE/DISABLE LOG**
  Enables or disables the display of FTP commands sent to the remote host.

- **ENABLE/DISABLE PARSE**
  Enables or disables the expansion of file name specifications.

- **ENABLE/DISABLE REPLy**
  Enables or disables the display of all responses from the remote host.

- **QUOTE**
  Sends FTP commands directly to the remote host without local interpretation.

The preceding commands control the way FTP displays command processing information and status. The SHOW STATUS command displays the current status of the FTP client (your local host) and, if you have a connection, the remote host.

By default, FTP returns multiple lines of error messages (MULTILINE is enabled). The first line explains the general problem, while subsequent lines provide details to help you diagnose the source of the problem. These lines may include operating system as well as FTP messages. Applications that use FTP to transfer files under program control often do not need the extra messages returned. To disable the MULTILINE feature, when you supply a password to connect to a remote host, precede the password with a hyphen "-" (-password), as in the following example:

```
$ FTP /USER=SALINGER /PASSWORD=-LETMEIN HAGELS
```

The SHOW STATUS command displays whether the MULTILINE feature is enabled.

You can modify the way FTP reacts to errors by using the SET ERROR_LEVEL command. By default, the error level setting is SUCCESS, which means that when FTP is running in batch mode, a warning or error message will cause FTP to exit. (FTP runs in batch mode when FTP commands are executed by a command procedure rather than interactively.) If you do not want FTP to exit upon a warning or error message, you can set the error level to ERROR.

For example, in the following command procedure, if the default error level (SUCCESS) is in effect and directory [MILLER.USERS] does not exist, the resulting error would cause FTP to exit.

```
$ FTP CONNECT HAGELS
cd [MILLER.USERS]
DEL *. *
EXIT
```
If the error level had been set to ERROR, FTP would not exit and the DELETE command in the command procedure would delete all files in your current working directory. Note that you can also set the error level to WARNING, which causes FTP to tolerate warning messages (but not error messages).

2.14 Command Procedures

You can use either OpenVMS or UNIX command syntax in DCL command procedures that use FTP. You can use command procedures to invoke FTP tasks, connecting to a remote host and performing assorted file operations with the remote host (See Section 2.14.1), and you can use command procedures to customize the FTP environment (See Section 2.14.2).

2.14.1 Task Command Files

You can create DCL command procedures that include FTP commands. In the following example, DCL command procedure FTP_TO_SANFRAN.COM invokes FTP and copies file needs.lis from host dave:

```
$! FTP_TO_SANFRAN.COM
$! This command procedure uses FTP from within $!
$! a DCL command file. Note that the password "letmein" $!
$! does not need quotation marks, but it is case sensitive. $!
$!
$ FTP
CONNECT sanfran
LOGIN dave
letmein
GET "nest.lis"
EXIT
$ EXIT
$
```

In the next example, command procedure FTP_PASS_PARAMETER.COM accepts parameters and writes and executes a temporary command procedure.

```
$!
$! FTP_PASS_PARAMETER.COM
$! This method is useful for automated BATCH queue jobs.
$!
$ WS == "WRITE SYS$OUTPUT"
$ IF P1 .EQS. "" .OR. P2 .EQS. "" .OR. P3 .EQS. "" .OR. P4 .EQS. ""
$ THEN
$ WS "@FTP_PASS_PARAMETER LOCAL-FILE SYSTEM USERNAME PASSWORD"
$ EXIT
$ ENDIF
$!
$ COM == "FTP_TEMP.COM"
$ LOG == "FTP_TEMP_COM.LOG"
$ FILE == ""P1"
$ USER == F$EDIT("P3", "LOWERCASE")
$ PASSW == F$EDIT("P4", "LOWERCASE")
$!
$ ON WARNING THEN GOTO ERR
$ OPEN/WRITE OUTFILE 'COM
$ WRITE OUTFILE ' DEFINE SYS$OUTPUT '"LOG"'
$ WRITE OUTFILE ' FTP'
$ WRITE OUTFILE 'open '"P2"
$ WRITE OUTFILE 'user '"USER"
$ WRITE OUTFILE '"PASSW"
$ WRITE OUTFILE 'put '"FILE'
$ WRITE OUTFILE "quit"
```
$ WRITE OUTFILE "$ EXIT"
$ CLOSE OUTFILE
$ @'COM
$ DELETE 'COM;*
$ PURGE 'LOG
$!
$! You can open the FTP_TEMP_COM.LOG file to check for errors,
$! for example, checking the initial return code for
$! 4xx (retry condition), or 5xx (failure condition).
$!
$ EXIT
$!
$ ERR:
$ IF F$TRNLNM("OUTFILE") .NES. "" THEN CLOSE OUTFILE
$ EXIT
$

2.14.2 Initialization Command File

Initialization command files can customize your FTP sessions with SET, ENABLE, and DISABLE commands. These command files are optional. They eliminate the need to enter individual FTP commands, and run automatically when you invoke FTP.

Initialization command files:

- Contain only VMS commands
- Contain only one command per line
- Generally named SYS$LOGIN:FTPINIT.INI

FTP uses the following search method to locate an initialization file:

1. FTP searches for a file specified by the logical TCPIP$FTPINIT.
2. If not found, FTP then searches for SYS$LOGIN:TCPIP$FTPINIT.INI.
3. If not found, FTP then searches for the file specified by the logical FTPINIT (provided for backward compatibility).
4. If not found, FTP then searches for SYS$LOGIN:FTPINIT.INI (provided for backward compatibility).

The following example shows an FTP initialization command procedure.

! This file, FTPINIT.INI, sets my FTP parameters
! the way I like them.
!
ENABLE REPLY
ENABLE TRANSFER_VERIFICATION
SET DEFAULT/LOCAL [MILLER.WORK]

When you invoke FTP, the initialization file generates output such as the following, which displays environmental status:

$ FTP
Reply on.
Verbose mode on.
Bell off.
Hash mark printing on (1024/hash mark).
Local directory now SYS$LOGIN_DEVICE:[MILLER.WORK]
2.14 Command Procedures

2.14.3 Setting Error Level

When you use FTP interactively, you decide what actions to take when an error or warning is generated. In batch mode, however, any error other than SUCCESS causes the batch process to exit by default.

The command procedure in the following example calls a file that does not exist, which generates an error and causes the procedure to exit:

```
$ @TEST_FTP
220 rainbow FTP Server (Version 5.60) ready.
Connected to rainbw.tcp.klg.dec.com.
331 Username PETERS requires a Password
230 User logged in.
200 TYPE set to IMAGE.
200 PORT command successful.
550-Failed to open WORK7$:[PETERS]TMP101.TMP; for input.
550 file not found
221 Goodbye.
```

Internally, the 3-digit FTP Protocol reply codes listed above are converted to one of the following OpenVMS System Messages:

<table>
<thead>
<tr>
<th>FTP Protocol Reply Code</th>
<th>OpenVMS System Message</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1XX</td>
<td>%TCP/IP-S-FTP_PRELIM</td>
<td>Success</td>
</tr>
<tr>
<td>2XX</td>
<td>%TCP/IP-S-FTP_COMPLETE</td>
<td>Success</td>
</tr>
<tr>
<td>3XX</td>
<td>%TCP/IP-S-FTP_CONTINUE</td>
<td>Success</td>
</tr>
<tr>
<td>4XX</td>
<td>%TCP/IP-W-FTP_TRANSIENT</td>
<td>Warning</td>
</tr>
<tr>
<td>5XX</td>
<td>%TCP/IP-E-FTP_ERROR</td>
<td>Error</td>
</tr>
</tbody>
</table>

When a command is executed, the mainline checks the return status. If you are in batch mode, then the value of the error level determines whether FTP will continue with each of the above codes.

To change the error level, you enter the following command where x is SUCCESS, WARNING, or ERROR:

```
FTP> SET ERROR_LEVEL x
```

- If ERROR LEVEL is SUCCESS, then WARNING, ERROR, and FATAL will exit FTP.
- If ERROR LEVEL is WARNING, then ERROR and FATAL will exit FTP.
- If ERROR LEVEL is ERROR, then only FATAL will exit FTP.

FATAL errors will always cause FTP to exit.

2.15 Using FTP with DECnet

To copy files from and to a DECnet node, use the standard GET and PUT commands as described in the following paragraphs.

You can copy files to and from DECnet nodes and get remote directory information, if your host and the DECnet node are connected through a host running DIGITAL TCP/IP Services for OpenVMS. Use the full file specification, including the node, device, directory, and file name.
2.15 Using FTP with DECnet

The following example copies local file FAX.TXT to DECnet node CURTAIL, renaming the file to CURRENT.TXT:

```
FTP> PUT FAX.TXT CURTAIL::DISK$3:[GEARY.KEEPS]CURRENT.TXT
```

The following GET command copies remote OpenVMS file HOUSING.TXT from DECnet node HABTAT and renames it to HOUSE.TXT:

```
FTP> GET HABTAT::DISK$2:[NATL.UTAH.SWEST]HOUSING.TXT HOUSE.TXT
```

2.16 Command Descriptions

To start FTP, enter the FTP command at the DCL prompt.

To use FTP commands, type them at the FTP> prompt.

This section provides complete descriptions of each FTP command, listed alphabetically. The related ENABLE and DISABLE commands are presented together (See the description for ENABLE).
**APPEND**

Appends a local file to a remote file. The remote file can reside on any system that supports FTP. To use this command, you must have an FTP session with a remote host.

**DCL-Style Format**

```
APPEND   local_file [ remote_file ]
```

**UNIX Style Format**

```
append   local_file [ remote_file ]
```

**Restrictions**

No wildcards.

**Parameters**

- `local_file`  
  Required.  
  Name of the local OpenVMS file.

- `remote_file`  
  Optional.  
  Name of the remote file, either UNIX or OpenVMS.

**Example**

```
FTP> APPEND LARGE.TXT CHRONOS
200 PORT command successful.
150 Opening ASCII mode data connection for CHRONOS. (130.180.4.8,1108)
226 Transfer complete
local:work1:[samson]large.txt remote:CHRONOS
15596 bytes sent in 00:00:00.10 seconds (152.30 Kbytes/s)
```

Appends local file LARGE.TXT to UNIX file chronos.
CONNECT

Establishes an FTP connection to a remote host. The remote host can be any operating system that supports FTP.

DCL-Style Format

CONNECT remote_host [ port ]

UNIX Style Format

open remote_host [ port ]

Parameters

remote_host
Required.
Remote host to which you want to connect.

port
FTP port on the remote host.

Example

FTP> CONNECT RETAIL  
220 retail.good_co.com FTP Server (Digital UNIX Version 5.60) ready.  
Connected to retail. 
Name (retail:dave): 
331 Password required for dave 
Password: (password not echoed) 
230 User dave logged in.  
FTP> 

User dave connects to UNIX host retail.
CREATE

Creates a directory on the remote host. The remote directory can be on any operating system that supports FTP. To use this command, you must have an FTP session with a remote host.

DCL-Style Format

CREATE/DIRECTORY remote_directory

UNIX Style Format

mkdir remote/path

Parameters

remote_directory  
remote/path  
Required.
Name for the created directory.

Qualifiers

/DIRECTORY
The /DIRECTORY qualifier must immediately follow the DELETE command without a space.

Creates a new directory or subdirectory. Must have write access to the lowest level directory under which the new directory will be created.

Examples

1. FTP> CREATE/DIRECTORY TERM  
   257 MKD command successful.
   In this example:
   • The remote host is UNIX.
   • The working directory is /usr/staff/dir.
   • The command creates directory /usr/staff/dir/term.

2. FTP> CREATE/DIRECTORY [.TRANSFERS]  
   257 MKD command successful.
   In this example:
   • The remote host is OpenVMS.
   • The working directory is DUA2:[CENTRAL].
   • The command creates the OpenVMS directory DUA2:[CENTRAL.TRANSFERS].
DELETE

Deletes either UNIX or OpenVMS remote files. To use this command, you must have an FTP session with a remote host.

Note

Use caution with the mdelete command. The FTP DIRECTORY command does not list hidden files (files that start with a period). Using the mdelete command with any wildcard deletes hidden files, which you might need.

DCL-Style Format

DELETE remote_files
DELETE/DIRECTORY remote_directory

UNIX Style Formats

delte remote_file
mdelete remote_files
rmdir remote_directory

Parameters

remote_file
remote_files
remote_directory
Required.
File, files, or directory to delete.

Qualifiers

/DIRECTORY
Optional. The /DIRECTORY qualifier must follow immediately after the DELETE command without a space.
Deletes an empty directory. To delete a directory that is not empty, you must first delete the contents of the directory.

Examples

1. FTP> DELETE [MAIN.BRANCH]*.*;*
   250 DELE of [MAIN.BRANCH]*.*;* successful.
   Deletes all files in the remote OpenVMS directory [MAIN.BRANCH].

2. FTP> DELETE/DIRECTORY BRANCH.DIR;1
   250 RMD command successful.
   Deletes the directory [MAIN.BRANCH].
3. `FTP> DELETE "/USERS/VENTURE/CARTON*"
   250 DELE command successful.

   Deletes UNIX file with path name /users/venture/carton.

4. `FTP> mdelete /bids/west/january97/c*"
   250 DELE command successful.
   250 DELE command successful.
   250 DELE command successful.

   Deletes three UNIX files starting with the letter "c" from directory /bids/west/january97. Note that the messages generated depend on the server. For example, for an OpenVMS server, messages would specify the names of the files deleted.
DIRECTORY

Lists the names of remote files and other information about them. The remote files can be on any FTP server. To use this command, you must have an FTP session with a remote host.

The DCL-style DIRECTORY command supports the redirecting of output to a file.

DCL-Style Format

DIRECTORY [ /BRIEF | /OUT=output_file ] [ remote_directory ]

UNIX Style Format

ls [ /remote/path ]

Parameters

remote_directory

/remote/path
Optional. Default: default directory.
Directory with the file names you want to list. Wildcards and multiple directories are valid.

Qualifiers

/BRIEF
Optional. Default: full display.
Produces output similar to the UNIX ls command.

/OUT=output_file
Optional. If you do not specify the /OUT qualifier, FTP displays output to SYS$OUTPUT. If you do specify the /OUT qualifier, you must supply a valid output_file specification.
Name of the file to hold the output.

Examples

1. FTP> DIRECTORY
   200 PORT command successful
   150 Opening data connection for /bin/ls (130.180.9.8,1150)
   total 76
   -rwxr--x 1 geary users 261 Nov 6 1996 .cshrc
   -rw-r--r-- 1 root users 128 May 21 11:16 .mailrc
   -rwxr--x 1 geary users 182 Nov 6 1996 .profile
   drwxr-x--x 2 geary users 512 Nov 6 1996 bin
   ...
   ...
   226 Transfer complete.
   911 bytes received in 00:00:00.07 seconds
   Displays a full listing of file names in the current default UNIX directory.
FTP Command Reference
DIRECTORY

2. FTP> ls disk3$:[banks.branch.bills]
  200 PORT command successful
  150 Opening data connection for DISK3$:[BANKS.BRANCH.BILLS] (11.1.2.3.4)
  LOCAL_ACCTS.DIS;1
  GO FIGURE.EXE;14
  COMPARE.EXE;4
  SUMTOTAL.COM;1

  226 NLST Directory transfer complete.
  428 bytes received in 00:00:00.41 seconds (10.06 Kbyte/s)
  FTP>

  Displays a listing of file names in the directory of the connected host, which
  is another OpenVMS system.
DISCONNECT

Terminates your session with the remote host and returns to the FTP prompt.

DCL-Style Format

DISCONNECT

UNIX Style Formats

   close
   disconnect
ENABLE (DISABLE) LOG

Enables or disables the display of all protocol commands sent to the remote host.
Default: DISABLE LOG.

DCL-Style Format

ENABLE LOG
DISABLE LOG

UNIX Style Format

debug

Example

FTP> ENABLE LOG
Bell off.
Debugging on {debug=1}.
FTP> ENABLE REPLY
Reply on.
Verbose mode on.
FTP> PUT PRICES.TXT YEAR.PRICES
----> PORT 1,2,3,4,7,138
200 PORT command successful.
----> STOR PRICES.TXT
150 Opening ASCII mode data connection for small.txt (1,2,3,4,7,138).
226 Transfer complete.
local: WORK1$:[samson]prices.txt;1 remote: year.prices
609 bytes sent in 00:00:00.02 seconds (179.36 Kbytes/s)
FTP> GET LAKE.IBIS LAKE_IBIS.DAT
----> PORT 1,2,3,4,7,138
200 PORT command successful
----> RETR lake.ibis
150 Opening ASCII mode data connection for lake.ibis (1.2.3.4,193)
226 Transfer complete
local: LAKE_IBIS.DAT remote:lake.ibis
4 bytes received in 00:00:00.03 seconds (0.13 Kbytes/s)
FTP>

Turns on the display of commands sent to the remote host. Shows all the commands sent to the remote host during the execution of PUT and GET.
ENABLE (DISABLE) PARSE

Enables or disables the expansion of remote file names during file transfers.

- PUT operations: expansion is done by the local host.
- GET operations: expansion is done on the remote host.

During GET operations, an expansion of a directory name might be different from the expansion of other file names. The result depends on the operating systems of the remote and local hosts.

DCL-Style Format

ENABLE PARSE
DISABLE PARSE

UNIX Style Format

glob

Examples

1. FTP> ENABLE PARSE
   FTP> PUT BIRDS*.TXT

   Enables parsing and the expansion of wildcards. Copies all the files starting with the characters BIRDS to the remote host.

2. FTP> ENABLE PARSE
   FTP> GET *.DOC

   Because parsing is enabled, the remote host expands the wildcard. All remote files ending in ".doc" are copied to the local system.

   The command is equivalent to:

   FTP> ENABLE PARSE
   FTP> MGET *.DOC
ENABLE (DISABLE) PORT_COMMAND

Enables or disables the sending of the FTP protocol PORT command to the remote host.

By default, FTP sends a PORT command when establishing a connection. If this command fails, FTP uses the default data port (20).

Disable the sending of the PORT command when you communicate with remote hosts that ignore PORT commands.

Default: ENABLE PORT_COMMAND.

DCL-Style Format

ENABLE PORT_COMMAND
DISABLE PORT_COMMAND

UNIX Style Format

sendport

Example

FTP> ENABLE PORT_COMMAND
FTP> PUT CODE.TXT
200 PORT command successful
150 Opening data connection for CODE.TXT (130.180.10.8,1182)
226 Transfer complete
local: DISK$PROJECT6:[MANAGEMENT]CODE.TXT;9 remote: CODE.TXT
3634 bytes sent in 00:00:00.04 seconds (88.72 Kbytes/s)

FTP enters a PORT command before the file transfer.
ENABLE (DISABLE) REPLY

Enables or disables the display of all the responses from the remote host.
Default: ENABLE REPLY.

DCL-Style Format

ENABLE REPLY
DISABLE REPLY

UNIX Style Format

debug

Example

FTP> ENABLE REPLY
Reply on.
Verbose mode on.
FTP> get birds.txt dogs.txt
200 PORT command successful.
150 Opening ASCII mode data connection for birds.txt (130,180,10,8,1570) (2405 bytes).
226 Transfer complete.
local: WORK1$:[SAMSON]DOGS.TXT;1 remote: birds.txt
2405 bytes received in 00:00:00.03 seconds (60.22 Kbytes/s)

FTP> DISABLE REPLY
Bell off.
Reply off.
Verbose off.
FTP> get birds.txt dogs.txt
FTP>

Enables the display of all the responses from the remote host. Copies birds.txt from the remote host, showing all the executed FTP commands in progress.
ENABLE (DISABLE) TRANSFER_VERIFICATION

Enables or disables the display of # for each 1000 bytes of transferred data. Default: DISABLE TRANSFER_VERIFICATION.

**DCL-Style Format**

ENABLE TRANSFER_VERIFICATION
DISABLE TRANSFER_VERIFICATION

**UNIX Style Format**

hash

**Example**

FTP> ENABLE TRANSFER_VERIFICATION
Bell off.
Hash mark printing on (1024/hash mark).
FTP> GET FUTURES.DIS FUTURES_H2.DIS
200 PORT command successful
150 Opening data connection for futures.dis (11.20.99.100,26)
###########
226 Transfer complete.
local: FUTURES_H2.DIS remote: futures.dis
15596 bytes received in 00:00:00.11 seconds (138.45 Kbytes/s)
FTP>

Enables the display of # for each 1000 bytes of transferred data. Copies futures.dis to FUTURES_H2.DIS, showing when 1000 bytes are transferred.
ENABLE (DISABLE) VMS_PLUS

Enables or disables VMS Plus Mode. This lets you specify a transfer mode based on file type, for example, ASCII or image.

With VMS Plus Mode disabled, FTP does not send the FTP SITE command. (Older implementations of the FTP server do not support this command.) The FTP client uses the FTP SITE command to identify itself (its SITE type) to the remote host. The SITE type of an FTP client can be either:

- **+VMS+** — The client is in VMS Plus mode.
- **NONE** — The client is not in VMS Plus mode.

Defaults:

- When you use FTP to connect to an OpenVMS host running TCP/IP Services for OpenVMS, VMS Plus Mode is enabled.
- When you use FTP to connect to a non-OpenVMS host or a VMS system running software that does not recognize VMS Plus Mode, VMS Plus Mode is disabled.

**Format**

```
ENABLE VMS_PLUS
DISABLE VMS_PLUS
```
EXIT

Closes an open connection and exits FTP. Entering Ctrl/Z is equivalent to the EXIT command.

DCL-Style Format

EXIT

UNIX Style Format

quit
At the DCL prompt, the FTP command starts an FTP session. For information about the FTP command, enter:

```
$ FTP
FTP> HELP
```

Information available:

```
APPEND  CONNECT  CREATE  DELETE  DIRECTORY  DISABLE
DISCONNECT  ENABLE  EXIT  GET  HELP  LOGIN  PUT
QUOTE  RENAME  SET  SHOW  SPAWN  VIEW
```

Topic?

or

```
$HELP FTP
FTP
```

Starts an FTP session and does one of the following:

- Displays the FTP prompt. You can issue FTP commands to customize your environment and FTP command processing.
- Establishes a connection to the specified remote host.

For help with individual FTP commands, enter:

```
$ FTP
FTP> HELP
```

DCL-Style Format

```
FTP [ host ] [ /USERNAME=remote_user_name ]
[ /PASSWORD=password ]
```

Press RETURN to continue ... 

```
[ /INPUT=file ]
```

UNIX Style Format

```
ftp [ host ]
```

Additional information available:

Parameters Qualifiers

```
/INPUT  /PASSWORD  /USERNAME
```

Examples

FTP Subtopic?
FTP Command Reference
FTP

FTP

The DIGITAL TCP/IP Services for OpenVMS software includes the File Transfer Protocol (FTP) service. The FTP command starts an FTP session and does one of the following:

- Displays the FTP prompt. You can enter FTP commands to customize your environment and FTP command processing.
- Establishes a connection to the specified remote host.

DCL-Style Format

```
FTP [ host [ port ] ] [/USERNAME=remote_user_name ]
   [ /PASSWORD=password ]
   [ /INPUT=input_filespec ]
```

UNIX Style Format

```
ftp [ host [ port ] ]
```

Parameters

- **host**  
  Optional.  
  Remote host to which you want to connect.

- **port**  
  Optional.  
  Specifies the port to use.

Qualifiers

- **/INPUT=input-filespec**  
  Optional. If you do not specify the /INPUT qualifier, FTP takes input from SYS$INPUT. If you specify this qualifier, you must also supply an input_filespec. FTP continues to prompt until it has a valid input_filespec.

  Runs a DCL command file with FTP commands.

- **/PASSWORD=password**  
  Optional. Default: your password on the local system.

  Password for the remote user account to which you want to connect.

- **/USERNAME=remote_user_name**  
  Optional. Default: your user name on the local system.

  Name of the remote user account to which you want to connect.

Examples

1. ```$ FTP
   FTP>
   ```

   Starts an FTP user session without establishing a connection.
2. `$ FTP WKSITE` 
   220 wksite.texts.wrights.com FTP Server (DIGITAL UNIX 13:34:28 EDT) ready
   Connected to wren.nest.willow.com.
   Name (wksite:parks)
   331 Password required for parks.
   Password: (password not echoed)
   230 User parks logged in.
   FTP>

   User PARKS starts an FTP session and connects to UNIX host wksite.

3. `$ FTP NEWY /USERNAME=BENSON /PASSWORD=WMSWMS` 
   220 NEWY.LINK1.MOA.COM FTP Server (Version 5.0) ready
   Connected to NEWY.LINK1.MOA.COM.
   331 Username BENSON requires a password.
   230 User logged in.
   FTP>

   Starts an FTP session and connects to remote OpenVMS host NEWY, in user account BENSON.
The GET command does the following:

- Copies remote files to the local host.
- Copies files from a DECnet node.

To use this command, you must have an FTP session with a remote host.

**DCL-Style Format**

```
GET [ /CONFIRM | /FDL ]  remote_file [ local_file ]
```

**UNIX Style Formats**

```
get  remote_file [ local_file ]
mget  remote_files
```

**Parameters**

- **remote_file**
  - Required.
  - Name of the remote file to copy.
  - To copy multiple files, separate the names with commas or plus signs.
  - When you specify multiple remote files, you cannot specify a local file name.
  - To copy a file from a remote DECnet node, use the full specification: node name, device, directory, file name.

- **local_file**
  - Optional. Default: Same name (without any device or directory names).
  - New name for the copied file. You cannot specify a local file name if you specify:
    - Multiple remote files
    - Wildcards in the remote file name

**Qualifiers**

- **/CONFIRM**
  - Optional. Default: immediate execution.
  - Asks you for confirmation before executing the copy operation.

- **/FDL**
  - Optional. Default: no secondary file created.
  - Uses a secondary file with the copied file's OpenVMS RMS record attributes (if you previously entered a PUT/FDL command). The SET TYPE command determines the type of file:
    - Specifying ASCII results in a sequential file with variable records. Select this type when transferring ASCII text files.
• Specifying IMAGE results in a sequential file with fixed records of 512 bytes. Select this type when transferring non-ASCII files such as executable image files.

Examples

1. FTP> GET "/seasons/standings/spring.deliveries*" SPORTS.TXT
   200 PORT command successful
   150 Opening ASCII mode data connection for spring.stats.
   .
   .
   .

Copies the UNIX file spring.deliveries to the OpenVMS host, where it is named SPORTS.TXT.

2. FTP> GET spring.deliveries SPORTS.TXT

Copies the same file (spring.deliveries) when it is in your remote working directory.

3. FTP> MGET *.DOC
   200 PORT command successful
   150 Opening ASCII mode data connection for cast.doc;1 (130.180.4.8,27)
   226 Transfer complete.
   local:cast.doc;1 remote: cast.doc;1
   1222 bytes received in 00:00:00.01 seconds (70.19 Kbytes/s)
   200 PORT command successful
   150 Opening ASCII mode data connection for director.doc;3 (130.180.4.8,28)
   226 Transfer complete.
   local: director.doc;1 remote: director.doc;3
   90 bytes received in 00:00:00.01 seconds (5.49 Kbytes/s)
   FTP>

Copies all the UNIX files ending with doc.

4. FTP> GET/CONFIRM *.;*
   Get EDTINI.EDT ? [Y or N] [Y]: Y
   .
   .
   .

Before executing the copy operation for every file in the remote default directory, FTP asks, one-by-one, to confirm that you want to copy each file.

To confirm MPUT, MGET, and MDELETE operations, use the FTP prompt command before entering the MPUT, MGET, and MDELETE commands.

FTP> prompt
Interactive mode on.
FTP> mget C*
Get CHRONOS ? [Y or N or Q or G] [Y]: y
   200 PORT command successful.
   150 Opening ASCII mode data connection for CHRONOS (130.180.4.8,2150) (1596 bytes).
   226 Transfer complete.
   local: WORK1$:[VANA]CHRONOS;2 remote: CHRONOS
   1596 bytes received in 00:00:00.04 seconds (31.80 Kbytes/s)

5. FTP> GET/FDL FEATHERS.DIS

Copies and preserves the record attributes of feathers.dis. (A PUT/FDL command was previously entered.)
HELP

Displays information about how to type FTP commands. Provides help for both DCL-style and UNIX Style commands, as follows:

- HELP — Displays all the DCL-style FTP commands
- HELP ftp_command — Displays DCL-style help information for the specified command
- ? — Displays all the UNIX Style FTP commands
- ? command — Displays help for the specified UNIX Style command

DCL-Style Format

```
HELP [ /REMOTE ] [ command ]
```

UNIX Style Formats

```
help [ command ]
?
```

Parameters

`command`

Optional.

FTP command about which you would like information.

Qualifiers

`/REMOTE`

Optional. Default: local host.

The remote host displays the FTP help information. If the remote host is a UNIX host, the FTP help is all UNIX style. If you want to display information about a specific command, the /REMOTE qualifier must follow the HELP command and precede the name of any command for which you want information, as shown in the second example.

Examples

1. FTP> HELP

Information available:

```
APPEND CONNECT CREATE DELETE DIRECTORY DISABLE
DISCONNECT ENABLE EXIT GET HELP LOGIN PUT
QUOTE RENAME SET SHOW SPAWN VIEW
```

Topic?

The local system displays the FTP DCL-style commands.
2. FTP> HELP/REMOTE
   214-The following commands are recognized (* =>’s)
   USER PORT RETR MSND* ALLO DELE SITE* XMKD CDUP
   PASS PASV STOR MSOM* REST* CWD STAT* RMD XCUP
   ACCT* TYPE APPE MSAM* RNFR XCWD HELP XRMD STOU
   REIN* STRU MLFL* MRSQ* RNTO LIST NOOP PWD QUIT
   MODE MAIL* MRCP* ABOR NLST MKD XPWD

   The remote host, a UNIX system, displays the FTP commands you can use in
   your FTP session with this system.

3. FTP> HELP/REMOTE USER
   214 Syntax: USER <sp> username

   The remote host displays information about the FTP USER command.

4. FTP> ?
   Commands may be abbreviated. Commands are:

   append disconnect mkdir remotehelp view
   ascii form mls rename view/p
   bell get mode reset view/pa
   binary glob mput rmdir view/pag
   bye hash open rstatus view/page
   case image prompt send vms
   cd lcd sendport status ?
   cdup ls put struct !
   close lpwd pwd unique
   delete mdelete quit type
   debug mdir quote user
   dir mget recv verbose

   This example shows you how to obtain FTP HELP on UNIX Style commands.
LOGIN

Initiates the login process and completes it if no password is required. If a password is required, enter it at the password prompt.

Use this command if the connection is active but the login procedure fails when you request a connection.

DCL-Style Format

LOGIN  user_name

UNIX Style Format

user  user_name

Parameters

user_name

Required.

Your account on the connected remote host.

Example

$ FTP
FTP> open bygnet
220 bygnet.band2.stat.com FTP server (Digital UNIX Version 5.60) ready
Connected to bygnet.
Name (bygnet:vana): evt
331 Password required for evt.
Password:
530 Login incorrect.
%TCPIP-E-FTP_LOGREJ, login request rejected
FTP> LOGIN "evt"
331 Password required for evt.
Password:  (password not echoed)
230 User evt logged in.
FTP>

While trying to connect and log in to remote UNIX host bygnet, user evt entered an incorrect passsword. Although host bygnet completes the connection, bygnet rejects the login request. The LOGIN command successfully completes the login to the remote host.
PUT

The PUT command does the following:
• Copies local files to a remote host.
• Copies files to a DECnet node.

File names are copied in lowercase without version numbers.

To use this command, you must have an FTP session with a remote host.

**DCL-Style Format**

```
PUT [ /qualifier(s)* ] local_file [ remote_file])
```

*Choose from the following qualifiers:
[ /CONFIRM ]
[ /CONVERT ]
[ /FDL ]
[ /RAW ]
)

**UNIX Style Formats**

```
put local_file [ remote_file ]
send local_file [ remote_file ]
mput local_files
```

**Parameters**

*local_file*
Required.
Name of the local file to copy.
• To specify multiple files, separate the names with commas.
• To use wildcards, enable parsing (See ENABLE PARSE command).

```
put file_name.ext — Copies the latest version
put file_name.ext;* — Copies all versions
```

• To copy a file to a remote DECnet node, use the full specification:
  nodename, device, directory, file name.

*remote_file*
Optional. Default: same name, same case, no version number (UNIX systems).
Name of the new file on the remote host. You cannot use wildcards.

**Qualifiers**

* /CONFIRM*
Optional. Default: immediate execution. The /CONFIRM qualifier must follow immediately after the PUT command without a space.
Asks you for confirmation before executing the copy operation.
FTP Command Reference

PUT

/CONVERT
Optional.
Translates the internal file-formatting characters of Variable Forms Control (VFC) files. The /CONVERT qualifier must follow immediately after the PUT command without a space.

/FDL
Optional. Default: no secondary file created. The /FDL qualifier must follow immediately after the PUT command without a space.
Creates a secondary file with the file’s OpenVMS record attributes. The SET TYPE command determines the type of file:

• Specifying ASCII results in a sequential file with variable records. Select this type when transferring ASCII text files.

• Specifying IMAGE results in a sequential file with fixed records of 512 bytes. Select this type when transferring non-ASCII files such as executable image files.

/RAW
Optional.
Maintains block mode of files regardless of the TCPIP$FTP_RAW_BINARY logical name definition. The /RAW qualifier must follow immediately after the PUT command without a space.

Examples

1. FTP> PUT SALES.LIS;*
   200 PORT command successful
   150 Opening ASCII mode data connection for sales.lis.2 (130.180.4.8,1028)
   226 Transfer complete
   local: DISK3$:[TRANS]SALES.LIS;2 remote: sales.lis.2
   3634 bytes sent in 00:00:00.01 seconds (394.31 Kbytes/s)
   200 PORT command successful
   150 Opening ASCII mode data connection for sales.lis.1 (130.180.4.8,1029)
   226 Transfer complete
   local: DISK3$:[TRANS]SALES.LIS;1 remote: sales.lis.1
   3634 bytes sent in 00:00:00.01 seconds (394.31 Kbytes/s)
   FTP>

Copies all versions of the local file SALES.LIS to the remote UNIX host.

• File names are copied in lowercase.

• OpenVMS file version numbers become the last element of the copied files.

• Semicolons are converted to periods.

• If the Store Unique feature is toggled on (sunique), then when you copy a file to an OpenVMS host, the host FTP server gives the file a new, unique version number. When you specify the version number of a file to be copied (PUT) to a remote UNIX host, the file retains the version number on the remote host, with the semicolon (;) replaced by a period (.). The UNIX host adds another version number to the file name as well. For example, if you PUT file BASES.TMP;2 to a UNIX host, the file name on the UNIX host will be bases.tmp.2.1.
2. FTP> PUT/FDL STAT.BCK "cygnet.bck"
   200 PORT command successful
   150 Opening data connection for cygnet.bckfdl (130.180.4.8,1028)
   226 Transfer complete
   local: cygnet.bckfd1  remote: cygnet.bckfd1
   21700 bytes sent in 00:00:00.03 seconds (662.23 Kbytes/s)
   200 TYPE set to IMAGE
   200 PORT command successful
   150 Opening data connection for cygnet.bck (130.180.4.8,1029)
   226 Transfer complete
   local: STAT.BCK  remote: cygnet.bck
   8152 bytes sent in 00:00:00.12 seconds
   FTP>

Copies the local file STAT.BCK to a UNIX host, giving the copy the name cygnet.bck. Also creates a secondary file with the RMS record attributes of file cygnet.bckfd1.
QUOTE

Sends your input directly to the remote host. Lets you use FTP commands that are implemented by the remote host but not known to the local host.

To use the QUOTE command, you must have an FTP session with a remote host. The QUOTE command is not valid for file transfer.

For a list of commands implemented by the remote host, enter:

FTP> HELP/REMOTE

DCL-Style Format

QUOTE command_line

UNIX Style Format

quote command_line

Parameters

command_line
Required.
Remote command you want to execute.

Example

FTP> QUOTE CDUP
250 CWD command successful.
FTP>

FTP sends the cdup command to the UNIX host to change the remote directory up one level.
RENAME

Renames a remote file. To use this command, you must have an FTP session with a remote host.

DCL-Style Format

RENAME  old_name new_name

UNIX Style Format

rename  old_name new_name

Parameters

old_name
Required.
File name on the remote host to rename.

new_name
Required.
New name for the remote file.

Examples

1.  FTP>ls
    BEARS
    bears
    your.doc.1
    sports.txt.txt
    STUDENTS.LIS
    226 Transfer complete.
    265 bytes received in 00:00:00.00 seconds (64.69 Kbytes/s)
    FTP> RENAME STUDENTS.LIS TEST_STUDENTS.LIS
    350 File exists, ready for destination name
    250 RNTO command successful.
    FTP>
    This example shows how to use the RENAME command to rename a file on a UNIX system.

2.  FTP> RENAME STUDENT.LIS TEST_STUDENT.LIS
    350 File WORK$:[VANA][STUDENT.LIS]; will be renamed.
    250 File WORK$:[VANA][STUDENT.LIS];1 renamed to WORK$:[VANA][TEST_STUDENT.LIS];1
    FTP>
    This example shows how to rename a file that exists on an OpenVMS system.
SET DEFAULT

Sets your default directory on either the remote host or the local host. To set the default directory on a remote host, you must have an FTP session with a remote host.

**DCL-Style Format**

```
SET DEFAULT [ /LOCAL ] directory
```

**UNIX Style Formats**

```
    cd directory
    lcd directory
```

**Parameters**

`directory`

Required.

Name of the directory to which to change the default.

**Qualifiers**

`/LOCAL`

Optional. Default: remote.

Changes the working directory on the local host.

**Examples**

1. `FTP> SET DEFAULT "/USR/USERS/ROLLINGS"
   250 CWD command successful.
   Changes the remote working directory to /usr/users/rollings.

2. `FTP> SET DEFAULT ~
   250 CWD command successful.
   250 New default directory is /USR/USERS
   Changes the remote working directory back to the default login directory.

3. `FTP> SET DEFAULT /LOCAL USER$1:[PRESS.CHECK]
   Local Directory now USER$1:[PRESS.CHECK]
   Changes your local working directory to USER$1:[PRESS.CHECK].`
SET ERROR_LEVEL

Sets maximum tolerance level for errors:

- **ERROR** — FTP tolerates errors and warnings, and will not exit when running in batch mode.
- **SUCCESS** — The default; FTP does not tolerate errors and will exit when running in batch mode.
- **WARNING** — FTP tolerates warnings and will not exit when running in batch mode.

**Format**

```
SET ERROR_LEVEL  error_level
```

**Parameters**

- **error_level**
  
  Required.

  Severity of errors tolerated. Specify ERROR, SUCCESS, or WARNING. The default is SUCCESS.

**Example**

```
FTP> SET ERROR_LEVEL ERROR
Error level is ERROR.

Sets the error level tolerance to ERROR.
```
SET TYPE

Defines the data representation type:

- ASCII — Appropriate for text files (default).
- IMAGE — Appropriate for transferring binary files, such as executable images.

DCL-Style Format

SET TYPE type

UNIX Style Format

type type

Parameters

**type**

Required.

Data representation type. Specify ASCII or IMAGE. If you do not use the SET TYPE command, the default is SET TYPE ASCII.

Example

FTP> SET TYPE IMAGE
200 Type set to I.

Sets the data representation type to IMAGE for files you transfer during the current FTP session.
SHOW DEFAULT

Displays the name of the working directory on the remote host or the local host. To use the SHOW DEFAULT command to display the working directory on the remote host, you must have an FTP session with a remote host.

DCL-Style Format

SHOW DEFAULT [ /LOCAL ]

UNIX Style Format

pwd

Qualifiers

/LOCAL
Optional. Default: remote directory.
Displays the local working directory.

Examples

1. FTP> SHOW DEFAULT
   257 "/usr/staff/hurry/items" is current directory.
   Displays the name of the working directory on the connected remote host.

2. FTP> SHOW DEFAULT /LOCAL
   Local directory is WORKS$:[CROWE].
   Displays the name of the working directory on the local host.
SHOW STATUS

Displays the current FTP parameter settings and, if you have an open connection, the name of the connected host and parameter settings relative to the connection.

DCL-Style Format

SHOW STATUS

UNIX Style Format

status

Examples

1. FTP> SHOW STATUS
   211-FTP Server Status.
   211-SITE set to +VMS+.
   211-TYPE set to ASCII.
   211-STRU set to FILE.
   211-MODE set to STREAM.
   211 Multiline responses are enabled.
   Connected to: HANKS.ABC.UBC.EDU
   VMS Plus mode enabled
   Mode = stream , Type = ascii, Form = non_print, Structure = file
   Error level is SUCCESS
   Reply display is on
   Parsing is on
   Prompting is off
   Port command is on
   Case: Filenames will be transferred in lowercase

   Displays the status of the connection with remote OpenVMS host HANKS. By default, FTP sets VMS Plus Mode for rapid file transfers between two OpenVMS systems running TCP/IP Services for OpenVMS.

2. FTP> status
   211-eagle.store1.equip.com FTP server status:
   Version 5.60
   Connected to eagle.store1.equip.com
   Logged in as jones
   TYPE: Image; STRUcture: File; transfer MODE: Stream
   211- No data connection
   211 End of status
   Connected to: eagle
   VMS Plus mode disabled
   Mode = stream , Type = image, Form = non_print, Structure = file
   Error level is SUCCESS

   Displays the current FTP parameters, which control data transfers with the connected UNIX host, eagle.
SPAWN

Suspends your current FTP session and runs the DCL command that you type.

**DCL-Style Format**

\[ \text{SPAWN [ command]} \]

**UNIX Style Format**

\[ ! [ command] \]

**Examples**

1. FTP> SPAWN SHOW DEFAULT  
   SYS$LOGIN_DEVICE:[PERCY.DISTR]
   
   Interrupts your FTP process to display your default directory.

2. FTP> ! SHOW DEFAULT  
   WORK1$:[VANA.FTP]
   FTP>
   
   You can also use the ! to spawn a command.
VIEW

Displays the contents of a file onto your current output device.

DCL-Style Format

VIEW [ /PAGE ] filespec

UNIX Style Format

view filespec

Parameters

filespec
Required.
Specifies the file to be displayed. Wildcard characters (*, %) are not allowed in place of the directory name, file name, file type, or file version number field.

Qualifiers

/PAGE
Optional.
Displays one screen at a time until the end of file (EOF) is reached. You can terminate the display at any time by pressing Ctrl/Z.

Examples

1. FTP> VIEW FUNDING.TXT
   Scrolls through the contents of the FUNDING.TXT file, in the current working directory, and displays the contents on the current output device.

2. FTP> VIEW/PAGE FUNDING.TXT
   Displays the contents of the FUNDING.TXT file, one screen at a time, on the current output device.
Using Remote (R) Commands

The Remote (R) commands provided by the DIGITAL TCP/IP Services for OpenVMS software allow you to work in accounts on remote internet systems also supporting the Remote (R) protocols. You can also enter commands, shell scripts, and command procedures to these remote host systems without logging in to the hosts. These R commands include RCP (Remote Copy), RLOGIN (Remote Login), RSH (Remote Shell), and REXEC (Remote Execute, invoked by RSH). You enter these commands at your system command line prompt.

What You Can Do
The following table lists the Remote (R) commands and services, the functions you can perform, and the sections that explain how to use them.

<table>
<thead>
<tr>
<th>Capability</th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remote copy (RCP command): Copy a file between the local host and a remote internet host</td>
<td>3.4</td>
</tr>
<tr>
<td>Copy a file between two remote internet hosts</td>
<td></td>
</tr>
<tr>
<td>Remote login (RLOGIN): Log in to an account on a remote host</td>
<td>3.5</td>
</tr>
<tr>
<td>Remote command or shell execution (RSH): Send a command to, or invoke a shell script or command procedure on a remote host</td>
<td>3.6</td>
</tr>
<tr>
<td>Remote command or shell execution with authentication (REXEC facility (using RSH/PASSWORD)): Using your user name and password for authentication, execute a command, shell script, or command procedure at a remote host</td>
<td>3.7</td>
</tr>
</tbody>
</table>

What You Need
To use the Remote (R) commands, you need access to an account on the remote host, which is granted by either of the following:

- An entry in the remote host’s authentication or proxy files
- Knowledge of a valid remote account and its password

Command Summary
Table 3–1 summarizes the Remote (R) commands (for complete command descriptions, see Section 3.8).

Table 3–1 Remote (R) Commands: Summary

<table>
<thead>
<tr>
<th>Function/Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RCP</td>
<td>Copies files between the local host and a remote host or between two remote hosts. Authentication is performed on the remote host or hosts using the user name supplied by RCP or authentication or proxy files.</td>
</tr>
</tbody>
</table>
Table 3–1 (Cont.) Remote (R) Commands: Summary

<table>
<thead>
<tr>
<th>Function/Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RLOGIN</td>
<td>Connects to the remote host, which starts an interactive login session. Authentication is performed on the remote host using the user name supplied by RLOGIN.</td>
</tr>
<tr>
<td>RSH</td>
<td>Connects to the remote host, which executes the command you specified. Authentication is performed on the remote host using the user name supplied to RSH.</td>
</tr>
<tr>
<td>RSH/PASSWORD</td>
<td>Uses the REXEC facility to connect to the remote host, which executes the command you specified. Authentication is performed on the remote host using the user name and password supplied by RSH.</td>
</tr>
</tbody>
</table>

3.1 Providing Account and Password Information

To use a remote command on your OpenVMS system, remote hosts need to know the user name that you want to use on the host. You can provide the user name in either of two ways:

- **Automatically:** You do not need to take any action if your user name is the same on the remote host as it is on the local host. The remote commands automatically supply your local user name as the requested user name on the remote system.

- **Using the /USER_NAME qualifier:** Specify the user name with the /USER_NAME qualifier if your user name is:
  - Different on the remote host
  - In mixed case (only for remote hosts supporting case-sensitive user names)
  - The same on the remote host but you want to access the remote host using another user name

By default, the R commands send all user names in lowercase letters. If you access a host that supports case-sensitive user names, and the user name you specify has uppercase letters, you may use the /NOLOWERCASE qualifier to maintain these letters as uppercase, or you can specify the /USER_NAME qualifier with the user name within quotes.

The remote host must also know your password or know you as a trusted user on your local system through a proxy or authentication:

- **Accessing remote hosts by providing your password:**
  - Certain systems have case-sensitive passwords. To send your lowercase or mixed-case password to these hosts, enclose it within quotation marks (" ").
  - On systems that are not case sensitive, you do not need to enclose your password within quotation marks (" ").
  - You can specify the password on the command line:

```
$ RSH WOODS /PASSWORD="Downy" LS
```
3.1 Providing Account and Password Information

Or, you can specify the password when the remote system prompts:

```bash
$ RSH WOODS /PASSWORD DIR
REXEC password: (password not echoed)
```

- **Accessing remote hosts as a trusted user:**

Most systems use certain authentication files or proxy accounts that allow trusted users on trusted hosts to access the system by specifying only the user name they want to use. To access a host without specifying the corresponding password, your originating host and user name must have an entry in these authentication files.

The authentication file entries contain your originating user name. The R commands convert your originating user name to lowercase unless you use the /NOLOWERCASE qualifier. You may have to contact the system manager of the remote system to determine if the system is case-sensitive and, if so, what case is used in the authentication files.

---

**Notes**

- To use the REXEC feature, you must always use the /PASSWORD qualifier.
- The RLOGIN command does not recognize the /PASSWORD qualifier. If you are a trusted user, you are automatically logged in to the remote system.
- If you are not a trusted user, the remote host (REXEC) prompts you to enter a user name and password on the remote system.

---

3.1.1 Quotation Marks

Use quotation marks (" ") for UNIX host path names that include slashes (/), such as user/simms/offers, and for user/host specifications that include the username@hostname syntax.

If the remote host uses case-sensitive user names and passwords, use quotation marks in the following situations:

- User names and passwords are mixed case.
- Passwords are lowercase.
- User names are uppercase, unless you use the /NOLOWERCASE qualifier.

3.1.2 Examples

The following examples show how to provide account and password information for the R commands.

1. **OpenVMS user STALLINGS accesses the file accnts on UNIX host ufemism as user stallings and copies the file to the current directory on the OpenVMS system. Because /LOWERCASE is the default, the /LOWERCASE and /USER_NAME=STALLINGS qualifiers are not needed. In this example, the user is a trusted user.**

```bash
$ RCP UFEMISM:ACCTS []
```

---

Using Remote (R) Commands  3–3
2. From OpenVMS, STALLINGS accesses the superuser account cris on ufemism. Because /LOWERCASE is the default, the /LOWERCASE and /USER_NAME=STALLINGS qualifiers are not needed. In this example, the user is a trusted user.

```
$ RLOGIN /USER_NAME=CRIS UFEMISM
Welcome to UNIX system ufemism.
ufemism%
```

3. User FINCH has the same uppercase name for both an OpenVMS account and a UNIX account. For RSH to send the uppercase OpenVMS account name to remote host ufemism in uppercase, FINCH uses the /NOLOWERCASE qualifier. In this example, the user is a trusted user.

```
$ RSH /NOLOWERCASE UFEMISM CAT -N GRANTS
```

4. User BACH has the account bach on the UNIX host classics. To invoke the REXEC feature, BACH specifies the password on host classics. Note that the password MagNificat is enclosed in quotes to prevent RSH from sending it all uppercase.

```
$ RSH /PASSWORD="MagNificat" CLASSICS LS
```

### 3.2 Specifying Qualifiers

You can specify R command qualifiers in either of two ways:

- Enter the qualifiers on the command line.
  
  `$ RCP /LOG TRANQUIL:VULTURES []`
  
  `$ RSH /EIGHTBIT /ESCAPE_CHAR="+" /TRUNCATE HERON CAT -N STREAMS`

- Add the same information to your LOGIN.COM file, for example:
  
  `$ ! To customize my R commands:
  $ !
  $ RCP ::= RCP /LOG
  $ RLOGIN ::= RLOGIN /EIGHTBIT/ESCAPE_CHAR="+" /TRUNCATE_USER_NAME
  $ RSH ::= RSH /EIGHTBIT /ESCAPE_CHAR="+" /TRUNCATE_USER_NAME
  $ !`

### 3.3 Obtaining Online Help

You can obtain online help for the Remote commands by entering the following command:

```
$ HELP TCPIP_SERVICES REMOTE_COMMANDS
```

You can also obtain information for a specific R command by entering one of the following commands:

```
$ HELP RCP
$ HELP RLOGIN
$ HELP RSH
$ HELP REXEC
```
3.4 Copying Files with RCP

The RCP (Remote Copy) command copies a file between your local host and a remote internet host. You can also use RCP to copy a file between two remote internet hosts. You specify the source and destination file names, each in the format appropriate for the source or destination system. For copying files from one remote host to another:

- If you do not have proxy login accounts (or authentication file entries) for both the source and remote hosts, you must have the same user name and password on both source and destination hosts. Use the /PASSWORD qualifier and, if necessary, the /USER_NAME qualifier, to specify the authentication information for the remote hosts.

- If you have a proxy login account (or authentication file entry) on one of the remote hosts only, use the /PASSWORD qualifier and, if necessary, the /USER_NAME qualifier to specify the authentication information for the other host.

By using the /RECURSIVE qualifier with the RCP command, you can recursively copy every file and subdirectory in a directory.

You can also use the COPY/RCP command to copy files across the network using TCP/IP. For more information on this command, enter HELP COPY/RCP at the DCL prompt.

Note that you can also use FTP to transfer files. To determine the best file transfer service to use for your needs, see Section 1.1.1. For more information about FTP, see Chapter 2.

3.4.1 Example RCP Commands

The following examples show how to use RCP commands to copy files from one host to another host:

1. User BEST has the account best on the UNIX host haven. User BEST’s password for that account is IMusici, which must be enclosed in quotation marks because it is mixed case. The following command copies the file /symph/nine on haven to the local directory on the OpenVMS system (the UNIX file specification must be enclosed in quotation marks, also):

   $ RCP /PASSWORD="IMusici" "haven:/symph/nine" []

2. User BEST has a proxy account on the remote UNIX host musicx. The following command copies the file /symph/pastoral from host musicx to the directory [SYMPH6] on the device DKA300: on BEST’s local OpenVMS system:

   $ RCP "musicx:/symph/pastoral" ":DKA300:[SYMPH6]"

3. With this command, user BEST copies each subtree rooted at the /symph directory to the directory [SYMPHS] on the device DKA300: on BEST’s local OpenVMS system.

   $ RCP/RECURSIVE "haven:/symph" "DKA300:[SYMPHS]"

4. With the following command, user BEST copies all files from the directory /symphonies on remote host musicx to the directory /symph on remote host haven:

   $ RCP /PASSWORD="IMusici" "musicx:/symphonies/*" "haven:/symph/*"
5. In the following example, user BEST uses the DCL COPY/RCP command to transfer the complete subdirectory tree /symph from remote UNIX host haven to remote OpenVMS host FRAM, which both require specification of a password. (With the RCP command, when transferring files between two remote hosts, you need a proxy account or an entry in the authentication file for at least one of the two remote hosts.) User BEST has an account under the same name on both hosts.

$ COPY/RCP haven"BEST IMusici":="/symph/" [Return]
To: FRAM"VAUGHN MYLES":[classic.compositions]"

3.5 Starting a Remote Login Session with RLOGIN

The RLOGIN (Remote Login) command connects your terminal to the remote host you specify and requests a login. If the remote host has an entry in its authentication files for your host and user name, it may bypass its login and password prompts. (See Section 3.1.)

Note that you can also use TELNET to log in to remote internet hosts. To determine the best remote login service to use for your needs, see Section 1.1.2. For more information about TELNET, see Chapter 4.

3.5.1 Logging Out

End your remote login session in either of two ways:

• Log out from the remote host.
• On a new line, enter the escape character and a period.

The default escape character is a tilde (~). To set another escape character, use the /ESCAPE_CHARACTER qualifier on the RLOGIN command line.

3.5.2 Example RLOGIN Sessions

The following examples show how to use the RLOGIN command.

1. The following command logs in to node CONDO:

   $ RLOGIN CONDO [Return]
   CONDO - Unauthorized access is prohibited
   Username: KING [Return]
   Password: (password not echoed) [Return]
   Welcome to OpenVMS (TM) Alpha Operating System, Version V7.1 on node CONDO
   Last interactive login on Thursday, 24-SEP-1998 15:20:29.60
   $ RUN ...
   $ ~/ (characters not echoed)
   %RLOGIN-S-LCLCLOSED, Local connection closed
   $

2. The following command logs in to host petrel and changes the character used to close the RLOGIN session:

   $ RLOGIN /ESCAPE_CHARACTER="+" PETREL [Return]
   .
   .
   Last login: Mon Mar 14 18:34:27 from phoebe.edu
   UNIX System petrel: Fri Mar 19 11:02:20 EST 1997
   Mon Jun 28 18:44:42 EST 1997

   %RLOGIN-S-LCLCLOSED, Local connection closed
   $
3.5 Starting a Remote Login Session with RLOGIN

% ls ...  
% +. (characters not echoed)
%RLOGIN-S-REMCLOSED, Remote connection closed
$

3.6 Issuing a Remote Command with RSH

The RSH (Remote Shell) command connects your terminal to a remote host and requests it to execute the command, script, or command procedure that you specify. If the command generates output, you see it as if it were produced locally. If you omit a remote command when you enter an RSH command line, RSH initiates an RLOGIN session. However, if the command line includes /PASSWORD, the remote login attempt fails. Using the /PASSWORD qualifier invokes REXEC. (See Section 3.7.)

Syntax rules require that you enter your RSH command line so that the remote command is the last word (or phrase).

3.6.1 Quotation Marks in Commands

If the remote command is one or more lowercase words, you do not need to enclose them in double quotation marks on the RSH command line. However, double quotation marks ("" ) are required for:

- UNIX commands that are mixed-case characters.
- UNIX commands that are uppercase characters.

In addition, RSH handles one double quotation mark (" ) and two consecutive double quotation marks ("" ) as follows:

- If you input one double quotation mark in a command line, RSH removes it.
- If you enter two consecutive double quotation marks on the command line, RSH removes the first quotation mark and leaves the second.
- If you surround text with a set of double quotation marks on the RSH command line, RSH disables the default conversion of characters to lowercase, and removes the quotation marks.

3.6.2 Interrupting a Command's Execution

To stop a remote execution, enter either Ctrl/C or Ctrl/Y.

3.6.3 Example RSH Commands

The following examples show how to use the RSH command.

1. In this example, the remote system manager previously created an entry in the authentication files for remote user STAN on host oster giving STAN permission to access user roly.

   From the local OpenVMS host, user STAN views roly's directory, which resides on UNIX system oster. No quotes are required around the user name and host name because RSH by default sends them in lowercase.

   $ RSH /USER_NAME=ROLLY OSTER LS

2. On the following RSH command line, the uppercase UNIX qualifier -R is entered within quotation marks to preserve the uppercase R. This example assumes that the user's originating host and user name are in the authentication files on the remote host debts.
Using Remote (R) Commands

3.6 Issuing a Remote Command with RSH

3. The following commands show how RSH sends quotation marks to a remote UNIX host and how quotation marks affect case. All examples assume that the user’s originating host and user name are in the authentication files on the remote host.

$ RSH DEBTS LS "-R"

$ RSH DEBTS ECHO TEST MESSAGE
test message

$ RSH DEBTS ECHO "\"test\"" message"
"test" message

$ RSH DEBTS ECHO TEST MESSAGE
test message

$ RSH DEBTS ECHO "TEST" MESSAGE
TEST message

$ RSH DEBTS "echo '"test"' message"
"test" message

4. Because no remote command is specified on the RSH command line, DIGITAL TCP/IP Services for OpenVMS executes RLOGIN.

$ RSH MOON01
Password: (password not echoed)

Last successful login for jjones: Fri Sep 25 10:58:31 1998 from nebula
Last unsuccessful login for jjones: Fri Sep 25 11:59:43 1998 on tty5

Digital UNIX V5.0 (Rev. 148); Tue Apr 7 18:32:54 EST 1998
Digital Equipment Corporation
Internal Use Only

moon01>

5. In this example, the OpenVMS system manager of WR2 previously created an entry in the authentication files for remote user SIMMS on host WR1. From OpenVMS host WR1, user SIMMS enters the DIRECTORY command to execute at WR2.

$ RSH WR2 DIRECTORY

6. In this example, the OpenVMS system manager of WR2 previously created an entry in the authentication files for remote user SIMMS on host WR1 allowing SIMMS access to the user name ROGERS. User SIMMS enters the DIRECTORY command from WR1 to execute at WR2 in user account ROGERS.

$ RSH WR2 /USER=ROGERS DIRECTORY

3.7 Issuing a Remote Command with a Password (REXEC Feature)

Use the REXEC feature to send a command to execute on a remote host that does not have, or might not have, the authentication information that RSH requires. The remote system’s authentication files are not used.

Along with the remote command, REXEC sends the password you specify on the command line to the remote host. This password is used for security checking.

The Remote Shell program invokes REXEC. To use REXEC, enter RSH /PASSWORD.
3.7 Issuing a Remote Command with a Password (REXEC Feature)

3.7.1 Example REXEC Use

The following example shows how to provide password information for the RSH command, thereby invoking the REXEC feature on the remote host.

From host GRANT, user STANTON enters the file `tops.holdings` that resides on UNIX host oster. Because STANTON is not listed in oster’s authentication files, user STANTON must use the REXEC feature and supply the `/USER_NAME` and `/PASSWORD` qualifiers. Quotes are required around the password because it contains uppercase letters.

```bash
$ RSH OSTER /USER_NAME=STANTON /PASSWORD="KeepingSaneJoy" -
$_$ CAT TOPS.HOLDINGS
```

3.8 Command Descriptions

This section provides complete descriptions of each R command. Included with each command description is the UNIX style equivalent of the command. These equivalents are valid on UNIX systems only. They are presented here for users who are familiar with the UNIX environment, to help them understand the nature of R commands.
RCP

Copies files between internet hosts. Enter the RCP command at the DCL prompt. You can copy files:

- From a remote host to your host
- From your host to a remote host
- From one remote host to another remote host

You can specify qualifiers in either DCL-style format or UNIX style format, but do not mix both types on the same command line.

**DCL-Style Format**

```
RCP [qualifier(s)...] source_file destination_file
```

- `[[NO]LOG ]`
- `[/PASSWORD[=password] ]`
- `[/[NO]PRESERVE ]`
- `[/[NO]RECURSIVE ]`
- `[/[NO]TRUNCATE_USER_NAME[=n] ]`

**UNIX Style Format**

```
r c p [- p][- r]/ [source_file]/ [destination_file]
```

This format is valid only on UNIX systems.

**Parameters**

- `source_file`
  Required.
  Source host and file specification, in the format "[username@]"host:file, where:
  
  - `username@` is the user name on a remote UNIX system, needed only if the UNIX system has the name in its `/etc/hosts.equiv` file or the UNIX user’s `.rhosts` file. Enclose the `username@` portion, or the entire specification containing the `username@` syntax, in quotation marks (" ").
  
  - `host` is the remote host, followed by a colon (:).
  
  - `file` is the name of the file to copy. A file name without the full path specification defaults to the default (or home) directory. Table 3–2 shows the possible correct formats.
### Table 3–2 RCP Command: Specifying the Source File

<table>
<thead>
<tr>
<th>Host</th>
<th>Possible Formats</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNIX hosts</td>
<td>Specify the following, enclosing UNIX path names that include slashes (/) in quotation marks (&quot; &quot;):</td>
</tr>
<tr>
<td></td>
<td>• Absolute path name, such as /etc/user/hosts, followed by the file name</td>
</tr>
<tr>
<td></td>
<td>RCP/USER_NAME=&quot;jjones&quot;/PASSWORD=&quot;letmein&quot; STATS.TXT - sysair:=&quot;/usr/users/jamesj/stats.txt&quot;</td>
</tr>
<tr>
<td></td>
<td>• Path name relative to your default directory, followed by the file name</td>
</tr>
<tr>
<td></td>
<td>RCP/USER_NAME=&quot;jjones&quot;/PASSWORD=&quot;letmein&quot; STATS.TXT - sysair:&quot;~jamesj/stats.txt&quot;</td>
</tr>
<tr>
<td>OpenVMS hosts</td>
<td>Specify the following:</td>
</tr>
<tr>
<td></td>
<td>• Brackets ([ ]), which indicate your default directory, followed by the file name</td>
</tr>
<tr>
<td></td>
<td>RCP/USER_NAME=JJONES/PASSWORD=LETMEIN OUR.DOC SYSAIR:[GROUP.DOC</td>
</tr>
<tr>
<td></td>
<td>• Full file specification, such as DKA0:[WILDE.BIRDS.NORTHERN]CHAPTER1.TXT</td>
</tr>
<tr>
<td></td>
<td>To specify a device name, enter a colon (:) and then the name. Endose the entire parameter within quotation marks (&quot; &quot;).</td>
</tr>
<tr>
<td></td>
<td>RCP/USER_NAME=JJONES/PASSWORD=LETMEIN CHAP1.TXT - SYSAIR:&quot;DKA0:[WILDE.BIRDS.NORTHERN]CHAPTER1.TXT&quot;</td>
</tr>
<tr>
<td></td>
<td>• A logical name, such as SYS$LOGIN:ROBIN.DAT or DIAK$9:[AMERICAN]FINDINGS.LIS</td>
</tr>
<tr>
<td></td>
<td>To specify a logical name, enter a colon (:) and then the name. Endose the entire parameter within quotation marks (&quot; &quot;).</td>
</tr>
<tr>
<td></td>
<td>RCP/USER_NAME=JJONES/PASSWORD=LETMEIN CHAP1.TXT - SYSAIR:&quot;SYS$LOGIN:CHAPTER1.TXT&quot;</td>
</tr>
</tbody>
</table>

---

**destination_file**  
Required.

Destination host and file specification information is of the same form as the source parameter, unless the file specification is completely omitted or the file name portion of the file specification is omitted. In these cases, the default file name used is the same as specified in the source parameter, the directory being the default/home directory of the user.

---

**Qualifiers**

/LOG  
/NOLOG

Optional. Default: no logging.

Logs the files copied to or from the local system.
Remote (R) Commands Reference
RCP

/PASSWORD=password
Required if /USER_NAME qualifier is used.
Password on the source or destination host system (whichever requires authentication).

/PRESERVE (OpenVMS Style)
/NOPRESERVE
-p (UNIX style, valid only on UNIX systems)
Optional.
Preserves the file protection mode and modification date during a copy.

/RECURSIVE (OpenVMS Style)
/NORECURSIVE
-r (UNIX style, valid only on UNIX systems)
Optional.
Recursively copies each subtree rooted at the directory you specify in the UNIX file specification. For OpenVMS hosts, specify [directory...] (with three trailing periods) in the file specification instead of using this qualifier.

/TRUNCATE_USER_NAME[=n]
/NOTRUNCATE_USER_NAME
Optional. Default: no truncation.
Truncates the user name to the specified number of characters. If you omit n, the default is eight characters.

/USER_NAME=remote_user_name
Optional. Default: current name on local host in lowercase.
Specify user name on the source or destination remote host. Use only if an entry allowing access to this user has not been added to the remote host’s authentication files. You must also specify the /PASSWORD qualifier with the /USER_NAME qualifier. If necessary, truncate the user name to the required number of characters using the /TRUNCATE_USER_NAME qualifier. Specifying "username@" with the source or destination parameter is the equivalent UNIX style method.

Examples

1. $ RCP/LOG NYX:STATS.BNT []
   Copies file stats.bnt from remote UNIX system nyx from under its home directory to a local file of the same name in the current directory. The /LOG qualifier causes information for the copy to be displayed. This command assumes the user has an entry in the authentication file on host nyx.

2. $ RCP HIAIR1:AIRFRS.TXT [FLTAT.STATS]FARES1.TXT
   Copies file AIRFRS.TXT from remote OpenVMS system HIAIR1, from under its home directory to a local file of a different name (FARES1.TXT) in the specified directory. This command assumes the user has an entry in the authentication file on host HIAIR1.
3. $ RCP /PRESERVE HIAIR1:[FARES.SUMMER]FARES_SU.TXT ":DKA300:" 

Copies file FARES_SU.TXT from directory [FARES.SUMMER] on remote OpenVMS system HIAIR1 to the specified device and directory on the local system. The new file maintains the same name as the original. The copy preserves the source file's protection mode and modification date. 

Use quotation marks ('"') for specifying the device and directory on the destination.

4. $ RCP /USER=MILLER /PASS="AirOut" ":SYS$LOGIN:PILOTS.LIS" FALCON: 

Copies file PILOTS.LIS from the login directory of user MILLER on the local system to the user's login directory on a remote UNIX system. The user specifies the user name and password for access to the UNIX system (the password is specified in quotation marks to preserve the mixed uppercase letters).

Use quotation marks ('"') for specifying the SYS$LOGIN device and file name on the destination.

5. $ RCP /RECURSIVE ":DKA300:[MILES...]" "nyx:/usr/tmp" 

Copies all files and any subdirectories under the local directory [MILES] to a remote UNIX host's destination directory. All the files in the subdirectories are copied as well, creating subdirectories on the remote host, as appropriate. The directory hierarchy is preserved on the UNIX host by default. This command assumes the user has an entry in the authentication file on host nyx.

6. $ RCP /LOG /RECURSIVE [MILES...] BOSTON:[FRFL...] 

Copies the complete local subdirectory tree ([MILES...] and all subdirectories) to the destination directory on remote OpenVMS host BOSTON, while preserving the directory hierarchy and logging each file copy. This command assumes the user has an entry in the authentication file on host BOSTON.

7. $ RCP /LOG /RECURSIVE [MILES...] BOSTON:[FRFL] 

Same as Example 6, except that all files in the local directory tree are copied directly to the destination directory itself. The command does not preserve the directory hierarchy of [MILES...] in [FRFL] on host BOSTON. In other words, the command does not create new subdirectories in BOSTON:[FRFL]; it copies all the files in [MILES] and all its subdirectories to directory [FRFL].

8. $ RCP /USER=VAUGHN /PASSWORD=MYLES /TRUNCATE=6 STATS.TXT FRAM:TISTICS 

Copies the local file STATS.TXT to a remote user's login directory. Note the truncation of the remote user name. A user name and password are necessary if no entries for the user are present in the remote host's authentication files.

9. $ RCP BOSTON:NAMES.LIS FRAM:ROSTER.LIS 

Copies file NAMES.LIS from remote host BOSTON to remote host FRAM (naming the file ROSTER.LIS). Assumes appropriate entries for the user have been made in each remote host's authentication files.
10. $ RCP "MILLER@BOSTON:SYS$DIR:T2.TXT" "nelson@nyx:/usr/nelson/T2.TXT"

Copies file T2 from remote OpenVMS system BOSTON in the directory pointed to by the logical name SYS$DIR to remote UNIX system nyx in the specified directory. Different user names are used on the two remote systems. Entries in the remote host's authentication files must be set up properly because the passwords are not being passed.

11. $ RCP /USER=ROSS /PASSWORD=LC12LC BOS:CLIENT.LIS "BEX:/usr"

Copies file CLIENT.LIS from OpenVMS host BOS to UNIX host bex. The user has a proxy account on the UNIX host. The specified authentication information allows access to the account for ROSS on host BOS.
REXEC

Sends a command line to a specified remote host for execution.

The difference between the REXEC facility and RSH is security checking:
- REXEC — The remote host bases authentication on user name and password.
- RSH — The remote host bases authentication on user name and information in the remote system's authentication files.

To invoke the REXEC feature, enter one of the following:

RSH /PASSWORD=password

or

RSH /PASSWORD

See the RSH command with the /PASSWORD qualifier.
RLOGIN

Initiates an interactive login session with a remote host.

DCL-Style Format

RLOGIN /DROP_TIMEOUT=seconds host

  [ /EIGHTBIT ]
  [ /ESCAPE_CHARACTER=character ]
  [ /LOG_FILE=file ]
  [ /LOWERCASE ]
  [ /PROBE_TIMEOUT=seconds ]
  [ /TERMINAL_SPEED=baud ]
  [ /TERMINAL_TYPE=type ]
  [ /TRUNCATE_USER_NAME ]
  [ /USER_NAME=remote_user_name ]

UNIX Style Format

rlogin host [-8] [-ec] [-l remote_user_name]

This format is valid only when logging in to a UNIX system.

Parameters

host
Required.
Remote host to which you want to connect.

Qualifiers

/DROP_TIMEOUT=seconds
Required if you set /PROBE_TIMEOUT.
Maximum interval, in seconds, that your network link can be down before the software closes it.

/EIGHTBIT
-8 (UNIX style, valid only on UNIX systems)
Optional. Default: only 7-bit data is sent.
Accepts 8-bit data from the terminal and sends it to the remote system.

/ESCAPE_CHARACTER=character
-ec (UNIX style, valid only on UNIX systems)
Optional. Default: ~ (tilde).
New escape character if you want to close your RLOGIN session from the remote host.
To close your session from your local host, use a period ( . ) as the escape command.

/LOG_FILE=file
Optional. Default: no logging.
Logs a copy of the output to the specified file. Output continues to be directed to SYS$OUTPUT while it is being recorded in the log file.

/LOWERCASE
/NOLOWERCASE
Optional. Default: /LOWERCASE.
Sends your local user name to the remote host in lowercase.
To send your user name in uppercase, use either of the following:

- Specify /NOLOWERCASE.
- Enclose the user name in quotation marks (" "). (See /USER_NAME.)
To send your user name in mixed case, enclose it in quotation marks (" ").

/PROBE_TIMEOUT=seconds
Required if you set /DROP_TIMEOUT.
Interval, in seconds, that DIGITAL TCP/IP Services for OpenVMS checks to see if your network link and the remote host are both still up.

/TERMINAL_SPEED=baud
Optional. Default: current speed of your terminal.
Terminal speed in baud rate.

/TERMINAL_TYPE=type
Optional. Default: type of physical terminal you are using.
Terminal type. Use this qualifier if the remote host does not recognize your terminal.

/TRUNCATE_USER_NAME
/NOTRUNCATE_USER_NAME
Optional. Default: /NOTRUNCATE_USER_NAME.
Abbreviates the user name sent to the remote host to eight characters (required for older UNIX hosts, which limit user names to eight characters).

/USER_NAME=remote_user_name
-l remote_user_name (UNIX style, valid only on UNIX systems)
Optional. Default: current name on local host, but in lowercase.
Your user name on the remote host. Specify this qualifier if your user names on the remote host and local host are different.
To send your user name in uppercase, use either of the following:

- Specify /NOLOWERCASE.
- Enclose the user name in quotation marks (" ").
To send your user name in mixed case, enclose it in quotation marks (" ").
Examples

1. $ RLOGIN /USER_NAME="BlissTon" ROLLS

   An OpenVMS user logs in to account BlissTon on UNIX host rolls. The mixed-case remote user name is in quotation marks so RLOGIN does not send it all lowercase, which is the default. This example assumes the user has a proxy account on the remote host.

2. $ RLOGIN /NOLOWERCASE /USER_NAME=DAVE PLETHORA

   User DAVE starts an interactive login session with UNIX host plethora. Because this user has an uppercase user name, it is specified with the /NOLOWERCASE qualifier. This example assumes the user has a proxy account on the remote host.

3. $ RLOGIN /ESCAPE_CHARACTER="+" PJARO

   Password: (password not echoed) 

   Last login: Fri Aug 21 16:50:40 from world.wide.webber.com


   You have mail.

   Tues Aug 25 11:02:20 EST 1998

   pjaro> who

   black  ttyp0  Aug 20 11:02  grades.philosophy.ucd.edu.
   bristow ttyp1  Aug 12 09:00  grades.biology.ucd.edu.

   pjaro> pwd

   /usr/users/black

   pjaro> ls

   bin                  Sem1.paper                Sem2.paper

   pjaro> .  (characters not echoed)

   %RLOGIN-S-REMCLOSED, Remote connection closed

   $

   OpenVMS user BLACK, with UNIX user name black, logs in to UNIX host pjaro and resets the escape character to a plus sign. By default, DIGITAL TCP/IP Services for OpenVMS passes the user name and commands to the remote host in lowercase.

4. $ RLOGIN FANTAC

   OpenVMS Version 7.1 - Unauthorized access is prohibited.

   Username: TDERR
   Password: (password not echoed) 

   .

   .

   $

TDERR logs in to remote OpenVMS host FANTAC.
5. $ RLOGIN QANCE /DROP_TIMEOUT=45

%RLOGIN-E-INETERROR, Internet interface error
-RLOGIN-I-INETCALL, setsockopt(TCP_DROP_IDLE)
-SYSTEM-F-BADPARAM, bad parameter value
$

The command fails because the /DROP_TIMEOUT and /PROBE_TIMEOUT qualifiers must both be set.
RSH

Sends a command to a remote host for execution, including a command that invokes a remote shell script or remote command procedure. Any command recognized by the remote host is valid. When using the RSH command, consider the following:

- If you omit a command for remote execution, RSH initiates a remote login session (see the RLOGIN command).
- If you specify the /PASSWORD qualifier, with or without a value, RSH executes the REXEC facility (see the /PASSWORD qualifier and the REXEC command).

DCL-Style Format

```
RSH  host [/EIGHTBIT ] [ remote_command ]
   [ /ESCAPE_CHARACTER=character ]
   [ /LOG_FILE=file ]
   [ /[NO]LOWERCASE ]
   [ /PASSWORD=password ]
   [ /[NO]SYSERROR ]
   [ /TERMINAL_SPEED=n ]
   [ /TERMINAL_TYPE=type ]
   [ /[NO]TRUNCATE_USER_NAME ]
   [ /USER_NAME=remote_user_name ]
```

UNIX Style Format

```
rsh  host [ -1 remote_user_name ] [ remote_command ]
```

This format is valid only on UNIX systems.

Parameters

**host**

Required.

Remote host at which you want the command to execute.

**remote_command**

Optional. Default: none.

Command you are sending to the remote host for execution.

```
Note
The remote_command must be the last item on the command line.
```

Qualifiers

**/EIGHTBIT**

Optional. Default: only 7-bit data is sent.

Accepts 8-bit data from the terminal and sends it to the remote system.
Remote (R) Commands Reference

RSH

/ESCAPE_CHARACTER=character
Optional. Default: ~ (tilde).
New RLOGIN escape character. This character lets you exit the RLOGIN process without typing the remote host's typical logout sequence, for example, LOGOUT or Ctrl/D.
Typing the escape character and a period (.) breaks the connection with the remote host, for example:
remote> ~. (characters not echoed)
%RSH-S-LCLCLOSED, Local connection closed
local_vms>

/LOG_FILE=file
Optional. Default: no logging.
Logs a copy of the output to the specified file. Output continues to be directed to SYS$OUTPUT while it is being recorded in the log file.
Not valid with /SYSERROR.

/LOWERCASE
/NOLOWERCASE
Optional. Default: /LOWERCASE.
Sends your local user name to the remote host in lowercase.
To send your user name in uppercase, use either of the following ways:
• Specify /NOLOWERCASE.
• Enclose the user name in quotation marks (" "). (See /USER_NAME.)
To send your user name in mixed case, enclose it in quotation marks (" ").

/PASSWORD[=password]
Optional.
Your password on the remote host.
Invokes the local REXEC facility that directs your RSH command to the REXEC server on the remote host. This server does authentication checking using the user name and password that you specified on the RSH command line.
• Enclose the password in quotation marks (" ") if it is lowercase or mixed case.
• If you omit password, RSH (REXEC) prompts you for one.
• Do not use this qualifier if you want to initiate an RLOGIN session.
Directs diagnostics to SYS$ERROR and output to SYS$OUTPUT.
When SYS$ERROR and SYS$OUTPUT both output to the same terminal, the output might be garbled.
/NOSYSERROR directs output only to SYS$OUTPUT.

/TERMINAL_SPEED=n
Optional. Default: your terminal's current speed.
Terminal speed passed to the remote host during an RLOGIN session.
Remote (R) Commands Reference

RSH

/Terminal Type=type
Optional. Default: your terminal's current type.
Terminal type passed to the remote host during an RLOGIN session.

/Truncate User Name

/NOTRUNCATE_USER_NAME
Optional. Default: /NOTRUNCATE_USER_NAME.
Abbreviates the user name sent to the remote host to eight characters (required
for older UNIX hosts, which limit user names to eight characters).

/User Name=remote_user_name
-1 remote_user_name (UNIX style, valid only on UNIX systems)
Optional. Default: same name on local host, but in lowercase.
Your user name on the remote host. Specify this qualifier if your user names on
the remote host and local host are different.
To send your user name in uppercase, use either of the following ways:
• Specify /NOLOWERCASE.
• Endose the user name in quotation marks (" ").
To send your user name in mixed case, enclose it in quotation marks (" ").

Examples

1. $ RSH HENCE MAN CP
cp(l)
   Name
cp - copy file data
   Syntax
   cp [ -f ] [ -i ] [ -p ] file1 file2
   ...
   See Also
   cat(l), pr(l), mv(l)
$
   A user sends the man cp command to UNIX host hence for execution.

2. $ RSH /USER_NAME=ROGERS DELPHI LS
   OpenVMS user PHILIPS enters the ls command for execution at remote
   UNIX host delphi. PHILIPS is accessing an account called rogers.

3. $ RSH /PASSWORD=BLOOMER AVOC8N DIRECTORY
   OpenVMS user PANTO sends the DIRECTORY command to remote
   OpenVMS host AVOC8N. The remote directory listing is of PANTO's home
directory.
   RSH /PASSWORD invokes REXEC, which authenticates PANTO's remote
   password.
4. $ RSH /PASSWORD MAGIC CAT BUZZ.TXT
REEXEC password: (password not echoed) [Return]

A user sends the cat command to host magic. /PASSWORD invokes REXEC, which requires a password. Because the password was omitted from the command line, REXEC prompts the user for it.
Establishing Network Terminal Sessions Using TELNET/TN3270

With the TELNET software in DIGITAL TCP/IP Services for OpenVMS, you can log in to a remote internet system. This is called establishing a TELNET session. Your terminal appears to be attached directly to the remote system.

You can establish a TELNET session with a host that uses IBM 3270 model terminals (TN3270).

Note that you can also use RLOGIN to log in to remote internet hosts. However, RLOGIN does not have the ability to manage a 3270 session. To determine the best remote login service to use for your needs, see Section 1.1.2. For more information about RLOGIN, see Chapter 3.

What You Can Do
The following table lists the TELNET/TN3270 network terminal services and the sections that explain how to use them.

<table>
<thead>
<tr>
<th>Capability</th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use either DCL-style or UNIX style command syntax</td>
<td>4.1</td>
</tr>
<tr>
<td>Establish a network terminal session with any other host that uses TCP/IP as a transport</td>
<td>4.3</td>
</tr>
<tr>
<td>Log all terminal output to a file</td>
<td>4.5</td>
</tr>
<tr>
<td>Toggle between the remote host and the local TELNET prompt</td>
<td>4.7</td>
</tr>
<tr>
<td>Suspend TELNET/TN3270 to spawn a subprocess at the DCL prompt</td>
<td>4.8</td>
</tr>
<tr>
<td>Establish multiple TELNET sessions</td>
<td>4.9</td>
</tr>
<tr>
<td>Toggle between open sessions</td>
<td>4.9.1</td>
</tr>
<tr>
<td>Customize the way TELNET interprets control characters, sends and receives transmissions, and displays processing on your terminal</td>
<td>4.6.2</td>
</tr>
<tr>
<td>Send commands to the remote host that affect processing of commands you have entered</td>
<td>4.10</td>
</tr>
<tr>
<td>Run IBM 3270 model terminal emulation (TN3270)</td>
<td>4.12</td>
</tr>
<tr>
<td>Record a TN3270 screen's contents</td>
<td>4.12.5</td>
</tr>
</tbody>
</table>

What You Need
To use the network terminal services, you need the following:

• A user account on the remote host also running TELNET.
• A user account on the OpenVMS system that runs DIGITAL TCP/IP Services for OpenVMS.
Establishing Network Terminal Sessions Using TELNET/TN3270

Command Summary
To use TELNET, issue the commands summarized in Table 4–1 (for complete command descriptions, see Section 4.13).

Table 4–1 TELNET/TN3270 Commands: Summary

<table>
<thead>
<tr>
<th>DCL-Style</th>
<th>UNIX Style</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Starting (at the DCL Prompt)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TELNET</td>
<td>telnet</td>
<td>Invokes TELNET</td>
</tr>
<tr>
<td>TELNET remote_host</td>
<td>telnet remote_host</td>
<td>Invokes TELNET and establishes a connection to a remote host</td>
</tr>
<tr>
<td>TN3270</td>
<td>N/A</td>
<td>Invokes TELNET and TN3270</td>
</tr>
<tr>
<td>TN3270 remote_host</td>
<td>N/A</td>
<td>Invokes TELNET, runs TN3270, and establishes a connection to a remote host</td>
</tr>
</tbody>
</table>

| **Getting In and Out of Sessions**                                |
| CONNECT                | open                | Establishes a connection between the local host and a remote host |
| CREATE_SESSION         | N/A                 | Establishes a pseudodevice and connects it to a remote listener port |
| DELETE_SESSION         | N/A                 | Deletes a pseudodevice created by the CREATE_SESSION command     |
| DISCONNECT             | close               | Terminates your current session                                 |
| Ctrl/\                | Ctrl/\             | Takes you from the remote host back to the TELNET prompt        |
| EXIT                   | quit                | Closes open connections and exits from TELNET                   |
| HELP                   | help                | Invokes online help                                             |
| RESUME                 | Return              | Resumes an open connection                                      |
| SPAWN                  | z                   | Suspends your TELNET session and takes you to the DCL prompt    |
### Table 4–1 (Cont.) TELNET/TN3270 Commands: Summary

<table>
<thead>
<tr>
<th>DCL-Style</th>
<th>UNIX Style</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DISABLE AUTOFLUSH</strong></td>
<td>toggle autoflush</td>
<td>Disables the automatic flushing of output when interrupt characters are sent</td>
</tr>
<tr>
<td><strong>DISABLE AUTOSYNCH</strong></td>
<td>toggle autosynch</td>
<td>Disables the automatic sending of interrupt characters in urgent mode</td>
</tr>
<tr>
<td><strong>DISABLE BINARY</strong></td>
<td>toggle binary</td>
<td>Disables transmission in binary mode</td>
</tr>
<tr>
<td><strong>DISABLE CRLF</strong></td>
<td>toggle crlf</td>
<td>Disables the sending of carriage returns as Return LF</td>
</tr>
<tr>
<td><strong>DISABLE CRMOD</strong></td>
<td>toggle crmod</td>
<td>Enables the mapping of received carriage returns as LF</td>
</tr>
<tr>
<td><strong>DISABLE DEBUG</strong></td>
<td>toggle netdata</td>
<td>Enables the display of data flow information in hexadecimal</td>
</tr>
<tr>
<td><strong>DISABLE LOCAL_CHARS</strong></td>
<td>toggle localchars</td>
<td>Disables the interpretation of certain control characters by your local TELNET client and passes them to the remote TELNET server</td>
</tr>
<tr>
<td><strong>DISABLE OPTIONS_VIEW</strong></td>
<td>toggle options</td>
<td>Disables the display of option negotiations between the client and server</td>
</tr>
<tr>
<td><strong>ENABLE AUTOFLUSH</strong></td>
<td>toggle autoflush</td>
<td>Enables the automatic flushing of output when interrupt characters are sent</td>
</tr>
<tr>
<td><strong>ENABLE AUTOSYNCH</strong></td>
<td>toggle autosynch</td>
<td>Enables the automatic sending of interrupt characters in urgent mode</td>
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<tr>
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<td>toggle binary</td>
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<td>toggle crmod</td>
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<tr>
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<td>toggle netdata</td>
<td>Enables the display of data flow information in hexadecimal</td>
</tr>
<tr>
<td><strong>ENABLE LOCAL_CHARS</strong></td>
<td>toggle localchars</td>
<td>Enables the interpretation of certain control characters by your local TELNET client and prohibits them from being passed to the remote TELNET server</td>
</tr>
<tr>
<td><strong>ENABLE OPTIONS_VIEW</strong></td>
<td>toggle options</td>
<td>Enables the display of option negotiations between the client and server</td>
</tr>
<tr>
<td><strong>SHOW DEVICE</strong></td>
<td>display</td>
<td>Displays the current devices</td>
</tr>
<tr>
<td><strong>SHOW PARAMETERS</strong></td>
<td>display</td>
<td>Displays the current parameter settings</td>
</tr>
<tr>
<td><strong>SHOW SESSION</strong></td>
<td>status</td>
<td>Displays the current sessions</td>
</tr>
<tr>
<td><strong>SET ECHO</strong></td>
<td>set echo</td>
<td>Sets the echo character to the specified character</td>
</tr>
<tr>
<td><strong>SET ERASE</strong></td>
<td>set erase</td>
<td>Sets the erase character to the specified character</td>
</tr>
<tr>
<td><strong>SET ESCAPE</strong></td>
<td>set escape</td>
<td>Sets the escape character to the specified character</td>
</tr>
<tr>
<td><strong>SET</strong></td>
<td>set flushoutput</td>
<td>Sets the flush output character to the specified character</td>
</tr>
</tbody>
</table>
Establishing Network Terminal Sessions Using TELNET/TN3270

Table 4–1 (Cont.) TELNET/TN3270 Commands: Summary

<table>
<thead>
<tr>
<th>DCL-Style</th>
<th>UNIX Style</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customizing the TELNET Environment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SET INTERRUPT</td>
<td>set interrupt</td>
<td>Sets the interrupt character to the specified character</td>
</tr>
<tr>
<td>SET KILL</td>
<td>set kill</td>
<td>Sets the kill character to the specified character</td>
</tr>
<tr>
<td>SET MODE</td>
<td>mode</td>
<td>Sets the transmission mode to character or line</td>
</tr>
<tr>
<td>SET QUIT</td>
<td>set quit</td>
<td>Sets the quit character (an alternate interrupt character) to the specified character</td>
</tr>
<tr>
<td>SET TERMINAL</td>
<td></td>
<td>Sets the terminal type to the specified model</td>
</tr>
<tr>
<td>Sending Commands to the Remote Host</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SEND AO</td>
<td>send ao</td>
<td>Sends the Abort Output command</td>
</tr>
<tr>
<td>SEND AYT</td>
<td>send ayt</td>
<td>Sends the Are You There command, testing the path to the remote application and eliciting connection status information from the remote host</td>
</tr>
<tr>
<td>SEND BRK</td>
<td>send brk</td>
<td>Sends the Break command</td>
</tr>
<tr>
<td>SEND EC</td>
<td>send ec</td>
<td>Sends the Erase Character command</td>
</tr>
<tr>
<td>SEND EL</td>
<td>send el</td>
<td>Sends the Erase Line command</td>
</tr>
<tr>
<td>SEND GA</td>
<td>send ga</td>
<td>Sends the Go Ahead command</td>
</tr>
<tr>
<td>SEND IP</td>
<td>send ip</td>
<td>Sends the Interrupt character</td>
</tr>
<tr>
<td>SEND NOP</td>
<td>send nop</td>
<td>Sends the No Operation command to test whether data can be sent to the remote host, eliciting an error if the connection is not open</td>
</tr>
<tr>
<td>SEND SYNCH</td>
<td>send synch</td>
<td>Sends the Synchronize character</td>
</tr>
</tbody>
</table>

4.1 Typing TELNET/TN3270 Commands

Use the following rules when you enter a TELNET command line.

4.1.1 DCL and UNIX Command Formats

With the TELNET command and most of the commands at the TELNET prompt, you can use either DCL-style or UNIX style syntax. For example, the following two commands produce the same results:

```
$ TELNET
TELNET> SHOW PARAMETERS

$ TELNET
TELNET> DISPLAY
```

4.1.2 Quotation Marks

No quotation marks are required for typing:

- The TELNET command line, for example:
  
  $ TELNET CENTRAL

- The TN3270 command line, for example:

  $ TN3270 CENTRAL
Establishing Network Terminal Sessions Using TELNET/TN3270

4.1 Typing TELNET/TN3270 Commands

- Commands at the TELNET prompt, for example:

  TELNET> CONNECT CENTRAL

The following example connects to UNIX host migain and sets a terminal type with the /TERMINAL_TYPE qualifier. No quotation marks are needed to pass a terminal type to migain in lowercase, as demonstrated with the remote host's printenv command.

$ TELNET MIGAIN /TERMINAL_TYPE=vt300
%TELNET-I-Trying, Trying ...11.90.208.56
%TELNET-I-SESSION, Session 01, host migain, port 23
-TELNET-I-Escape, Escape character is `[^`

Hello from UNIX host migain
login: root
Password:...
.
.
migain# printenv
TERM=vt300
HOME=/
SHELL=/bin/csh
USER=root
PATH=/bin:/usr/bin:/usr/ucb:/etc:/usr/etc:
LOGNAME=root
PWD=/migain#
migain#

4.2 Obtaining Online Help

You can obtain online help for the TELNET and TN3270 services by entering any of the following commands:

$ HELP TELNET
$ HELP TN3270
$ HELP TCPIP_SERVICES TELNET

You can also enter the HELP command at the TELNET prompt:

TELNET> HELP

4.3 Starting TELNET and TN3270

You can start a TELNET or TN3270 session with a remote host (also called establishing a connection and opening a connection) in one of the following ways:

- At the DCL prompt, issue either the TELNET or TN3270 command and specify a remote host.
- At the DCL prompt, issue the TELNET or TN3270 command with no parameters. At the TELNET or TN3270 prompt that appears, issue the CONNECT or open command, specifying a remote host.
- Invoke and use TELNET or TN3270 from a command procedure (see Section 4.6.1).
Establishing Network Terminal Sessions Using TELNET/TN3270

4.3 Starting TELNET and TN3270

The following example shows three ways to establish a connection interactively:

$ TELNET CENTRAL /TERMINAL_TYPE=IBM-3278-2

$ TELNET
TELNET> CONNECT CENTRAL 23 VT200

$ TN3270 CENTRAL /TERMINAL_TYPE=IBM-3278-3

You can invoke TELNET or TN3270 and, without connecting to a remote host first, enter certain commands that customize the sessions and display parameters or status.

$ TELNET
TELNET> SHOW STATUS
%TELNET-E-NOSSESSION, No active session
Escape character: ‘^’
TELNET> SET DEVICE TERMINAL=VT300
TELNET> OPEN GALAXY
%TELNET-I-TRYING, Trying ... 1.20.208.10
%TELNET-I-SESSION, Session 01, host galaxy, port 23
-TELNET-I-ESCAPE, Escape character is ‘^’

Digital UNIX (galaxy.udb.com) (ttyp5)
login:

4.4 Exiting TELNET and TN3270

You can end a TELNET or TN3270 session (close the connection) in one of the following ways:

• At the remote host's system prompt, log out.
• At the remote host's system prompt, return to the TELNET or TN3270 prompt and disconnect the session, as follows:
  1. At the remote host's system prompt, press the TELNET/TN3270 escape character (Ctrl/\ is the default).
  2. At the TELNET or TN3270 prompt, issue either DISCONNECT or close.

The following example shows two ways to close connections:

% logout
%TELNET-S-REMCLOSED, Remote connection closed
-TELNET-I-SESSION, Session 01, host galaxy, port 23
TELNET>

TELNET> EXIT
$

% Ctrl/\ (characters not echoed)
TELNET> DISCONNECT
galaxy.udp.com>
TELNET> DISCONNECT
%TELNET-S-LCLCLOSED, Local connection closed
-TELNET-I-SESSION, Session 01, host galaxy, port 23
TELNET>
4.5 Keeping a Log of Your TELNET Session

To keep a log of your TELNET session, use the /LOG_FILE qualifier. (You cannot use this qualifier with a TN3270 session.)

The following example establishes a TELNET connection to node central, sets the terminal type to VT200, and logs all session output to the file CENT.LOG in your current directory.

```
$ TELNET/LOG_FILE=CENT.LOG/TERMINAL_TYPE=VT200 CENTRAL
```

4.6 Command Procedures

With DCL command files, you can start TELNET and TN3270 sessions (see Section 4.6.1) and customize the TELNET/TN3270 environment (see Section 4.6.2).

4.6.1 Starting TELNET/TN3270

You can create a command procedure containing the DCL DEFINE and TELNET (or TN3270) commands.

The following example shows an example of a TELNET command procedure.

```
#!/ My TELNET startup command file, START_TELNET.COM.
!
! This command procedure establishes a TELNET session
! with UNIX host central.
!
$ DEFINE /USER_MODE SYS$INPUT TT:
$ TELNET CENTRAL
```

4.6.2 Initialization Command Files

You can create initialization command files to customize your TELNET/TN3270 sessions with SET, ENABLE, and DISABLE commands. These command files:

- Are optional. They eliminate the need to issue individual TELNET commands.
- Have the following requirements:
  - Location: Your login directory
  - Name: TELNETINIT.INI
  - Format: one command per line
- Run automatically when you invoke TELNET or TN3270.
- You can specify the logical name, TELNETINIT, to point to an initialization file.

The following example shows a TELNET initialization command procedure.

```
! This file, TELNETINIT.INI, sets my TELNET parameters
! the way I like them.
!
DISABLE AUTOFLUSH
ENABLE BINARY
ENABLE DEBUG
SET DEVICE /TERMINAL=VT300
SET ESCAPE "^p"
```
4.7 Toggling Between the Remote Host and Local TELNET/TN3270

During a session with a remote host, you can toggle back and forth between the local TELNET or TN3270 process and the connected host. For example, at the TELNET prompt, you might want to display status, modify a TELNET parameter, or spawn a DCL subprocess.

• To return to the local TELNET or TN3270 prompt (TELNET command mode), enter the TELNET escape sequence (the default is Ctrl/\) at the remote host’s prompt (TELNET input mode).

• To resume your session with the remote host, enter one of the following at the TELNET (or TN3270) prompt.

  TELNET> Return
  or
  TELNET> RESUME
  or
  TELNET> RESUME n
  where n is the number of the session to which you want to return.

• To change the default escape sequence, enter the following at the TELNET (or TN3270) prompt:

  TELNET> SET ESCAPE "^escape_character"

The following example toggles between remote UNIX host biway and the local OpenVMS system.

biway> ^D (characters not echoed)
TELNET> SHOW STATUS
Session 1 Active Host biway Port 23
  Operating Mode: Character-at-a-time
  Escape character: ‘\’
  Options:
    Echo - Remote
    Terminal Type - Local
    Terminal Type - VT300
    Suppress Go Ahead - Local
    Suppress Go Ahead - Remote
  Terminal Dataoveruns: 0
  Suspended Network I/Os: 0


TELNET> Return
biway>

In the next example, user BENTLEY, working at OpenVMS node EAGLE, uses TELNET to do the following:

1. Establish a connection to UNIX host fern.
2. Return to the local TELNET prompt.
3. Display status.
4. Establish a connection to host gannet.
5. Return to the TELNET prompt.
Establishing Network Terminal Sessions Using TELNET/TN3270

4.7 Toggling Between the Remote Host and Local TELNET/TN3270

6. Display status.

7. Connect to sands. But, sands closes the connection because BENTLEY incorrectly enters the password three times.

8. Try to resume the session with gannet. However, RESUME without specifying a session number fails:
   - With multiple sessions, RESUME's default is the "active" session, the one with the most recently opened connection.
   - The most recent host to which BENTLEY connected is sands. However, due to BENTLEY's incorrectly typing of the password during login, sands closed the TELNET connection. Thus, TELNET displays "No current session."
   - Because no connection is "active" (or "current"), BENTLEY must specify a session number on the RESUME command line.

$ TELNET FERN
   .
   .
fern>  [Ctrl/
   (characters not echoed)

TELNET> SHOW STATUS
Session 1 Active Host FERN
   .
   .
TELNET> CONNECT GANNET
   .
   .
gannet>  [Ctrl/
   (characters not echoed)
TELNET> SHOW STATUS
Session 2 Active Host GANNET
   Operating Mode: Character-at-a-time
   Escape character: ’\’
   .
   .
Session 1 Waiting Host FERN
TELNET> CONNECT SANDS
%TELNET-I-Trying, Trying...11.18.222.95
%TELNET-I-SESSION, Session 03, host sands, port 23
-TELNET-I-Escape, Escape character is ’\’.
   .
   .
   Sun Microsystems, Inc. UNIX System sands - Authorized Access Only

Username: BENTLEY
Password:
User authorization failure
Username: BENTLEY
Password:
User authorization failure
Username: BENTLEY
Password:
User authorization failure
Remote connection closed
TELNET> RESUME
No current session
TELNET> SHOW STATUS
Session 1 Waiting Host FERN
Session 2 Waiting Host GANNET
TELNET> RESUME 2
gannet> Ctrl/
(characters not echoed)
TELNET> SHOW STATUS
Session 2 Active Host GANNET
Operating Mode: Character-at-a-time
Escape character: ‘^]’
TELNET>

4.8 Suspending TELNET to Return to the Local DCL Prompt

While using TELNET, you can use the SPAWN command to suspend your current session and create a subprocess at the local DCL prompt. At the DCL prompt, you can then enter any number of DCL commands. To return to your suspended TELNET session (exiting the DCL subprocess), enter the LOGOUT command.

In the following example, the user suspends the TELNET session to list the files in the working directory on the local host and deletes one of the files in that directory.

TELNET> SPAWN
$ DIR
  .
  .
$ DEL TR3.TXT:*

4.9 Multiple Sessions

TELNET supports:
- Multiple simultaneous connections
- Up to 10 simultaneous sessions
- Only one session at a time if it uses TN3270

The TELNET SHOW STATUS command helps you keep track of multiple sessions. The SHOW STATUS display uses the terms shown in Table 4–2.
### Table 4–2 TELNET SHOW STATUS Display: Terminology

<table>
<thead>
<tr>
<th>Term</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Active host</strong></td>
<td>Host from which you typed the escape sequence to return to the TELNET prompt.</td>
</tr>
<tr>
<td><strong>Current session</strong></td>
<td>If you log out of the active host at its system prompt, or issue the TELNET DISCONNECT command, no current session exists.</td>
</tr>
<tr>
<td></td>
<td>To resume a connection, even if only one exists, issue:</td>
</tr>
<tr>
<td></td>
<td>TELNET&gt; RESUME n</td>
</tr>
<tr>
<td><strong>Waiting hosts</strong></td>
<td>Other hosts with whom you have open sessions, numbered in the order that you connected to them.</td>
</tr>
<tr>
<td></td>
<td>To resume a connection with a waiting host, even if only one exists, issue:</td>
</tr>
<tr>
<td></td>
<td>TELNET&gt; RESUME n</td>
</tr>
</tbody>
</table>

To open another TELNET connection:

1. At the system prompt of the remote host, press the TELNET escape sequence (default is Ctrl/`).
2. TELNET returns to the TELNET prompt.
3. Start another session by issuing the CONNECT command.

The following example starts multiple sessions with UNIX hosts `finder` and `keeper`.

```bash
$ TELNET FINDER
...
finder>
...
finder> Ctrl/`(characters not echoed)
TELNET> CONNECT KEEPER
...
...
keeper>
...
keeper> Ctrl/`(characters not echoed)
TELNET>
```

### 4.9.1 Toggling Between Open Sessions

To toggle from one open TELNET connection to another:

1. Enter the TELNET escape sequence.
2. If necessary, issue SHOW STATUS to check the number of your session with the other host.
3. Issue the TELNET RESUME n command, where n is the number of the session to which you want to return.

For an example, see Section 4.7.
4.9 Multiple Sessions

4.9.2 Displaying Session Information

To display a list of your active sessions, use the SHOW SESSION command:

```
TELNET> SHOW SESSION
Session 01, host finder, port 23
Session 02, host keeper, port 23 (default active session)
```

If there are no active connections, the SHOW SESSION command displays the following message:

```
%TELNET-E-NOSESSION, No active session
```

4.10 Customizing TELNET/TN3270 Transmissions, Control Characters, and Displays

To customize the TELNET/TN3270 processing environment, issue ENABLE, DISABLE, and SET commands. You can modify how TELNET and TN3270:

- Send and receive transmissions
- Display processing on your terminal
- Interpret certain control characters

You can redefine the following control characters, such as when your terminal or the remote host does not recognize the corresponding default control character.

- Echo
- Erase
- Escape
- Flush output
- Interrupt
- Kill
- Quit

Use the SET command to redefine these characters. For example, the following command defines the interrupt character to be the letter a or A.

```
TELNET> SET INTERRUPT "^a"
```

TN3270 allows you to redefine your keyboard. You can redefine most IBM 3270 model functions and all emulated functions and characters. You can create a key definition file with DEFINE/KEY statements to redefine the keyboard. Or, you can redefine a key interactively, using the DEF KEY function (Ctrl/K on VT100- and VT200-series terminals). (See Section 4.12.9.)

You can determine the mode TELNET uses to transmit data. The appropriate TELNET mode for a session depends on:

- The remote host to which you are connecting
- The applications you use
Table 4–3 shows the modes that control TELNET communications.

Table 4–3 TELNET Transmission Modes

<table>
<thead>
<tr>
<th>Mode</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local Characters Mode</td>
<td>The local host interprets control characters, translating them into TELNET protocol sequences (ENABLE LOCAL_CHARS). Use this mode when the local and remote hosts implement different control characters. By default, characters are interpreted by the remote host (DISABLE LOCAL_CHARS).</td>
</tr>
<tr>
<td>Binary Mode</td>
<td>The local host sends transmissions in binary mode (ENABLE BINARY). Use this mode when the remote host expects each line of data to end with a carriage return/line feed combination. By default, the local host sends transmissions with the end-of-line character (EOL) mapped to the carriage return/line feed combination (DISABLE BINARY).</td>
</tr>
<tr>
<td>Debug Mode</td>
<td>TELNET displays data flow in both hexadecimal and readable text (ENABLE DEBUG). By default, TELNET displays data in readable text only (DISABLE DEBUG).</td>
</tr>
<tr>
<td>Character Transmission Mode</td>
<td>TELNET transmits data one character at a time (SET MODE CHAR) rather than line-by-line. Use this mode when you run a text editor (on the remote host) that does character processing. Character transmission mode is the default.</td>
</tr>
<tr>
<td>Line Transmission Mode</td>
<td>TELNET transmits data one line at a time (SET MODE LINE). Most clients send a character at a time. The remote host server must support line transmission mode. This allows you to do signal trapping as well as local character editing and tab expansion.</td>
</tr>
</tbody>
</table>

4.11 Sending Commands to the Connected Remote Host

While in input mode (an active session with a remote host), you can enter SEND commands that affect the remote host’s processing of commands you have entered. You use these commands when the remote host does not recognize the default key or key sequence used for the same operation. You can use the SEND AYT and SEND NOP commands to determine if your session with the remote host is still open. Table 4–4 lists the functions available to you at the remote host with each SEND command.
### 4.11 Sending Commands to the Connected Remote Host

<table>
<thead>
<tr>
<th>Function</th>
<th>Command</th>
<th>When to Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abort output of the last remote command you entered, without discontinuing execution of the process.</td>
<td>SEND AO</td>
<td>You want to terminate output but not the execution of the process. After already aborting output, you want to resume output. The remote host does not recognize the Ctrl/O as the flush output character.</td>
</tr>
<tr>
<td>Determine if your connection with the remote host is still established, the remote host replying with connection status information.</td>
<td>SEND AYT</td>
<td>Test the connection to the remote host application and verify that the remote host application is responding. You are notified on success.</td>
</tr>
<tr>
<td>Terminate execution of the last command you entered at the remote host.</td>
<td>SEND BRK</td>
<td>The remote host does not recognize the Ctrl/C sequence as an interrupt character.</td>
</tr>
<tr>
<td>Delete the last character you entered at the remote host.</td>
<td>SEND EC</td>
<td>The remote host does not recognize your Delete key.</td>
</tr>
<tr>
<td>Delete the last line of text you entered at the remote host.</td>
<td>SEND EL</td>
<td>The remote host does not recognize your Delete key or command-line recall.</td>
</tr>
<tr>
<td>Signal the remote host that your local system is ready.</td>
<td>SEND GA</td>
<td>The application requires GA commands in either one or both directions.</td>
</tr>
<tr>
<td>Interrupt execution of the last command you entered at the remote host.</td>
<td>SEND IP</td>
<td>Your terminal or the remote host does not recognize the default interrupt character (Ctrl/C).</td>
</tr>
<tr>
<td>Determine whether your local host can send data to the connected remote host and whether the remote host can receive that data.</td>
<td>SEND NOP</td>
<td>Check the communication path to the remote host; you are notified on error.</td>
</tr>
<tr>
<td>Interrupt the current process you are executing at the remote host, and in urgent mode (out-of-band), get a quicker response time to the interrupt.</td>
<td>SEND SYNCH</td>
<td>You want to clear immediately the communications path between your system and the remote host, with the remote host ignoring any incoming data not yet processed.</td>
</tr>
</tbody>
</table>

### 4.12 IBM 3270 Model Terminal Emulation (TN3270)

You can run a TELNET session with a host that uses IBM 3270 model terminals by using the TN3270 command. The TN3270 command:

- Provides IBM 3270 Information Display System (IDS) terminal emulation.
- Assigns IBM 3270 functions to your DIGITAL keyboard.
- Assigns IDS functions to specific keys.

During a TN3270 session, you can:

- Redefine keys interactively (Section 4.12.9.0.6).
- Redefine keys permanently (Section 4.12.9.0.5).
- Record your sessions (Section 4.12.5).
4.12 IBM 3270 Model Terminal Emulation (TN3270)

- Troubleshoot problems (Section 4.12.9.1).

Note: When you run TN3270, you can only have one session. You cannot have other sessions running simultaneously, as you can when running normal TELNET sessions.

4.12.1 Supported IBM Terminal Models

Table 4–5 lists the IBM 3270 terminal models that TELNET/TN3270 can emulate.

<table>
<thead>
<tr>
<th>Model</th>
<th>Screen Size (Rows x Columns)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM 3278 Model 2</td>
<td>24 x 80</td>
</tr>
<tr>
<td>IBM 3278 Model 3</td>
<td>32 x 80</td>
</tr>
<tr>
<td>IBM 3278 Model 4</td>
<td>43 x 80</td>
</tr>
<tr>
<td>IBM 3278 Model 5</td>
<td>27 x 132</td>
</tr>
</tbody>
</table>

4.12.2 Setting Up Your PC or Terminal for IBM 3270 Terminal Emulation

When you use TELNET and specify IBM 3270 model terminal emulation (TN3270), the image displayed on your screen depends on:

- The type of DIGITAL terminal you use, or that your PC is emulating.
- The features you set on it.

Sections 4.12.2.1 and 4.12.2.2 explain how to set up VT200- and VT100-series terminals (or emulation on PCs), respectively.

4.12.2.1 VT200-Series Terminal Setup

Follow these steps:

1. At the Set-up Directory menu, select the keyboard type that corresponds to the keyboard layout you are using (for example, North American).
2. At the Display Set-up menu, select the following:
   - Interpret controls
   - Light text, dark screen
   - Cursor (visible)
3. At the General Set-up menu, select the following:
   - VT200 or VT100 mode (if VT100 mode, set VT100 ID)
   - 7-bit or 8-bit controls
   - Multinational/national
   - Normal cursor keys
   - No new line
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4.12 IBM 3270 Model Terminal Emulation (TN3270)

4. At the Communications Set-up menu, select the following:
   - XOFF at 64 or XOFF at 128
   - 8-bit communication line
   - 8-bit (any) parity
   - No local echo

5. At the Keyboard Set-up menu, select warning bell ON.

At the DCL prompt, issue:

$ SET TERMINAL /INQUIRE

The software determines the terminal's characteristics and sets the appropriate parameters.

If you select National Character mode, issue:

$ SET TERMINAL /NOEIGHTBIT

4.12.2.2 VT100-Series Terminal Setup

Follow these steps:

1. Set your terminal to ANSI mode (see the user's guide for your terminal).

2. Enter the following command at the DCL prompt:

   $ SET TERMINAL/INQUIRE

   This command causes the terminal to be questioned about its characteristics.
   The appropriate parameters for the terminal are set up according to its response.

TN3270 requires DIGITAL terminals or DECterm windows that support at least 24 lines and 80 columns.

4.12.3 Starting and Exiting from TN3270

Start a TN3270 session by using the TN3270 command. You can also use the TELNET/TERMINAL_TYPE=IBM-3278-n command. The default terminal type is IBM-3278-2. The following examples show several ways to start a TN3270 session, using the TN3270 command and connecting to host CENTRAL. For more information, see Section 4.3.

- Using the default terminal type:

  $ TN3270 CENTRAL

- Using a terminal type other than the default:

  $ TN3270/TERMINAL_TYPE=IBM-3278-4 CENTRAL

You can invoke TN3270 and, without connecting to a remote host first, enter certain commands that customize the sessions and display parameters or status. You can also use a command file to invoke TN3270 and the customization.

The TN3270 command includes several qualifiers that allow you to specify customized or special files for the following:

- Character set translation tables file (CHARACTER_SET=file) that translates between EBCDIC and the DIGITAL Multinational Character Set. The default file, if set up by your system manager, is SYS$LIBRARY:TN3270DEF.TBL.
If this file does not exist, and you do not specify a file, TN3270 uses its own translation table.

- Keyboard definition file (/KEY_DEFINITIONS=file) that you create as an alternative to the default keyboard layout.
- National Replacement Character Set (NRCS) file (/NATIONAL_CHARACTERS=n) for which your DIGITAL terminal is configured. The default for 8-bit terminals is MULTINATIONAL. The default for 7-bit terminals is US_ASCII.

You can end a TN3270 session (close the connection) in one of the following ways:

- At the remote host's system prompt, log out.
- At the remote host's system prompt, return to the TN3270 prompt and disconnect the session, as follows:
  1. At the remote host's system prompt, press the TN3270 escape character (Ctrl/ is the default).
  2. At the TN3270 prompt, issue either DISCONNECT or close.

### 4.12.4 Clearing Error Messages

TN3270 displays error messages in a bordered display at the bottom of your screen. This display overwrites the status display and remains visible until you clear it. To clear, invoke one of the following functions:

- REFR
- HELP
- SET FIL
- DEF KEY

### 4.12.5 Recording Sessions

During a TN3270 session, you can record your screen's contents. The PRINT function directs your screen's contents to either a file or a spooled printer.

To record your screen's contents, follow these steps:

1. Invoke the PRINT keyboard function, as explained in Section 4.12.8.
   The screen display is recorded in a file in a compressed state. Null lines (lines with only nulls and attribute characters) do not appear.
2. Invoke the ENTER function or any function that transmits the screen contents to the remote host's application, as explained in Section 4.12.8.

This creates the default output file, TN3270PRINT.LIS. TELNET does the following:

- Each time you start a TELNET session that runs TN3270, TELNET opens a new TN3270PRINT.LIS file.
- Each time you use PRINT during a session, TELNET appends new output from the screen to the end of TN3270PRINT.LIS.
- Each time you use PRINT, if you direct the output to a printer, TELNET creates a separate entry in the print queue.
- If the printer is spooled, TELNET immediately prints the output.
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4.12 IBM 3270 Model Terminal Emulation (TN3270)

You can specify a different file name. To change the name, use one of the following two methods:

- When you start a TN3270 session, use the /PRINTER qualifier. Issue:
  $ TN3270 [ host ] /PRINTER=file

- During a TN3270 session, follow these steps:
  1. Use the SET FIL keyboard function, as explained in Section 4.12.8.
  2. At the prompt for a new file name, enter a name.
     If you specify the same name that is already in use, subsequent PRINT operations direct output to a new version of the same file.
  3. Use the NEW LINE keyboard function, as explained in Section 4.12.8.

4.12.6 Online Help

Online help during a TN3270 session displays:

- A picture of the keypad
- A list of TN3270 keyboard functions
- The key combinations that invoke the TN3270 keyboard functions

The Help screen shows the TN3270 functions as they correspond to the keys on your physical keyboard:

- Top-row keys
- Editing keypad
- Application keypad
- Up to 32 control or extended character definitions
- All your definitions and changes, including those you make interactively

To see the Help screen, use the HELP function which is key F15.

4.12.7 If the Keyboard Locks

If your keyboard locks, the terminal bell rings, and the status line displays:

Inhib

To unlock the keyboard, press the following key to invoke the RESET function (KP0 refers to the 0 key in the application keypad on the right hand side of the keyboard):

KP0

Do not use the following functions when the cursor is in a protected field (a field that does not accept user input):

- DELETE
- DUP
- ER EOF
- FM
- Any graphic character
4.12.8 Keyboard Functions

This section describes the keyboard functions. Preceding each function description are the key sequences for VT100 and VT200 terminals and the function name to use in a DEFINE/KEY command. In many of the key sequences, TN3270 allows use of the extended function (EXT) feature. Used in conjunction with another key, EXT allows access to an extended function for that key. The extended function feature is described below in more detail.

**ATTACH**

VT100: EXT + E  
VT200: EXT + Find

**DEFINE_KEY Function:** ATTACH

Changes control from one subprocess to another subprocess or to the parent process. When you invoke the ATTACH function, TN3270 uses the name of the last process to which you attached as the default process name.

If you want to attach to a different process, press Ctrl/U to erase the default process name. You can then enter the process name of your choice at the prompt. The process name can be a quoted string. Use the quotation marks to preserve spaces, tabs, or lowercase letters in strings.

**ATTN**

VT100: EXT + A  
VT200: F19

**DEFINE_KEY Function:** ATTENTION

Provides a way to "get the attention of" the remote application program that you are running by sending a SIGNAL RU command to the remote host. See the user's guide of the particular application program to learn what response the program gives when you use this key.

**Back Tab ( | Left arrow)**

VT100: BACKSPACE  
VT200: F12

**DEFINE_KEY Function:** BACK_TAB

Moves the cursor, depending on the type of screen. On a formatted screen, the cursor moves one of these ways, depending on the location when you press this key:

- If the cursor is in a field, but not at the first position of the field, it moves to the beginning of the unprotected field that it is in.
- If the cursor is in the first position of a field, it moves to the beginning of the preceding unprotected field. If the cursor is in the first position of the first unprotected field, the cursor moves to the first position of the last unprotected field on the screen.

On an unformatted screen, the cursor returns to the first position on the screen.

**Cent Sign (¢)**

VT100: EXT + C  
VT200: EXT + C

**DEFINE_KEY Function:** (None)

Enters a cent sign. If your terminal does not have this character, your screen displays a hyphen ( - ).
CLEAR

VT100: EXT + Enter  VT200: EXT + F20

DEFINE_KEY Function: CLEAR

Clears the screen and moves the cursor to the first position on the screen. When you invoke the CLEAR function, the software notifies the application program that this function has been used.

DEF KEY (DEFINE key)

VT100: Ctrl/K  VT200: Ctrl/K

DEFINE_KEY Function: DEFINE_KEY

Lets you interactively define or redefine a key. You get a prompt for the name of the key to define and for a function you want to assign to that key. Refer to Section 4.12.9 for more information about using the DEF KEY function.

DELETE

VT100: Delete  VT200: `<X>`

DEFINE_KEY Function: DELETE

Deletes the character at the cursor. The cursor remains where it is, and the other characters to the right of the cursor in the same field move one position to the left. The end of the field fills with blanks. Note that this is not the action normally associated with the Delete key on DIGITAL terminals.

DSP ATT (display attributes)

VT100: Ctrl/V  VT200: EXT + F17

DEFINE_KEY Function: DISPLAY_ATTRIBUTES

Enables and disables the visible attribute mode. This mode of operation forces display of the attribute characters (that is, the characters at the start of a field that indicate the display and data type of that field). In IBM 3270 model terminal emulation (TN3270), you can use the DSP ATT function to debug application programs, as explained in Section 4.12.10.

DUP (duplicate)

VT100: EXT + *  VT200: EXT + F12

DEFINE_KEY Function: DUP

Lets you enter a value in the same field in several forms without needing to repeat the entry for each form.

After entering the data in the field on the first form, use the DUP function when at the same field on succeeding forms. The application program makes the necessary translation, filling in these fields with the same value. For details about the use of this key, refer to the user’s guide of the particular application program.

Displays an asterisk (*).

DV CNCL (device cancel)

VT100: EXT + U  VT200: EXT + Remove

DEFINE_KEY Function: DVCNCL
Cancels the RECORD function. Use the DV CNCL function if you begin using the RECORD function and then decide you want to stop. If you want to delete a sequence that has already been recorded on a PF key, use the RECORD function, press the PF key, and then use the DV CNCL function.

**ENTER**

VT100: Line Feed + Enter  
VT200: Do + Enter  
DEFINE_KEY Function: ENTER

Sends your input to the remote application program. While this communication is active, the keyboard locks and Inhib appears on the status line. Usually the application program releases the keyboard when it has finished processing your input.

**ER EOF (erase to the end of the field)**

VT100: EXT + KP,  
VT200: F18  
DEFINE_KEY Function: ERASE_EOF

Erases the contents of the current field, from the location of the cursor to the end of the field. The cursor remains in the same location.

**ER INP (erase input)**

VT100: EXT + KP-  
VT200: EXT + F18  
DEFINE_KEY Function: ERASE_INPUT

On a formatted screen, clears all the data in the unprotected fields on your screen and moves the cursor to the first position in the first unprotected field on the screen.

On an unformatted screen, clears all the data and moves the cursor to the first position on the screen.

You can also use the ER INP function to remove all previously recorded key sequences by using the RECORD function and then the ER INP function.

**EXIT**

VT100: Ctrl/Z or F10  
VT200: Ctrl/Z or F10  
DEFINE_KEY Function: EXIT

Terminates the remote TELNET/TN3270 session. Aborts any exchange of data in progress between the local and remote hosts. Note that terminating a session with the IBM host in this way may result in improper termination of the session. For the appropriate logoff command string, see the user’s guide for the IBM application with which you are communicating.

**EXT (extended function)**

VT100: KP.  
VT200: KP.  
DEFINE_KEY Function: EXTEND

Used in conjunction with another key, allows access to an extended function for that key. First invoke the EXT function and then press the second key. If you invoke EXT accidentally, invoking the RESET function cancels the EXT function.

If the status display is enabled when you invoke the EXT function, the word Extend appears on the status line.
FM (field mark)

**VT100: EXT + ;**  
**VT200: EXT + F13**  
**DEFINE_KEY Function: FM**

Specifies the end of a field on an unformatted screen or the end of part of an unprotected field on a formatted screen. Refer to the user’s guide of the remote application program for specific use of this key.

Displays a semicolon ( ; ).

HELP

**VT100: EXT + H**  
**VT200: Help**  
**DEFINE_KEY Function: HELP**

Displays online help and an illustration of the TN3270 keyboard.

HOME

**VT100: EXT + B**  
**VT200: F13**  
**DEFINE_KEY Function: HOME**

Repositions the cursor to the first position in the first unprotected field on the screen (that is, to the beginning of the input area on the screen).

Horizontal Control (Right arrow and Left arrow)

**VT100: Right arrow or Left arrow**  
**VT200: Right arrow or Left arrow**  
**DEFINE_KEY Function: RIGHT, RIGHT_NOWRAP, LEFT, or LEFT_NOWRAP**

Moves the cursor horizontally across your screen without changing data you have already entered. If the cursor is at the:

- **End of a line when you use the Right arrow function, the cursor moves to the start of the next line.**

- **Beginning of a line when you use the Left arrow function, the cursor moves to the end of the previous line.**

If the screen display you receive is wider than 80 columns, you can use the Right arrow and Left arrow functions to move through the display.

If you want the cursor to wrap to the opposite edge of the display, use one of the following function sequences:

- **EXT + Right arrow**
- **EXT + Left arrow**

INSERT

**VT100: EXT + PF4**  
**VT200: F14**  
**DEFINE_KEY Function: INSERT_MODE**

Enables insert mode. Use insert mode to edit what you entered. If the status display is enabled, Insert appears.

In insert mode, when you enter a character in to an unprotected field, it is displayed to the left of the cursor, moving the following one position to the right:

- **The cursor**
- **The character at the cursor location**
- **All the characters to the right of the cursor in the field**
You can insert characters in to an:

- Unformatted screen
- Unprotected field on a formatted screen until it is full

If you attempt to insert characters after the field is full, the keyboard locks, the terminal bell rings, and the word *Inhib* appears on the status line. If the keyboard locks when you try to insert characters in to a field that looks empty, the field might have trailing spaces. To erase these spaces, use the ER EOF function.

To return your screen to the normal mode of entry, use one of the following keyboard functions:

- **RESET**
- **CLEAR**
- **ENTER**
- Any PA key
- Any PF key

**Logical NOT (| -)**

VT100: EXT + N  
VT200: EXT + N

*DEFINE KEY Function: (None)*

Represents the remote host's symbol for a logical NOT; displayed as a circumflex (^) on DIGITAL terminals.

**Logical OR (| )**

VT100: EXT + O  
VT200: EXT + O

*DEFINE KEY Function: (None)*

Represents the remote host's symbol for a logical OR; displayed as a solid vertical line from the terminal's graphics set. Press Ext + O if the vertical bar is not available on your keyboard.

**New Line (Hooked left arrow)**

VT100: Return  
VT200: Return

*DEFINE KEY Function: NEWLINE*

Moves the cursor to the first unprotected position on the next line of your screen. If no unprotected fields are on the screen when you invoke the new line function, the cursor moves to the first location on the screen. If the screen has no fields, this key has the same function as the Return key on DIGITAL terminals.

**NUM OVR (numeric lock override)**

VT100: EXT + J  
VT200: Remove

*DEFINE KEY Function: NUMOVR*

Lets you enter nonnumeric characters in to numeric fields. Once you enable this function, use NUM OVR again to disable it. If you do not disable the numeric lock override, it remains enabled even after you exit from TN3270. The letter O appears on the status line to indicate that the numeric lock override is in effect.
Establishing Network Terminal Sessions Using TELNET/TN3270

4.12 IBM 3270 Model Terminal Emulation (TN3270)

PA1, PA2, PA3

VT100: PF4, KP-, KP,          VT200: PF4, KP-, KP,
DEFIN_KEY Function: PA1–PA3

These program access keys are defined by the program you are using. These keys request attention from the remote application program without sending any data. You should refer to the user's guide of your application program to learn how the PA keys are defined.

PF1 through PF24

VT100: see below          VT200: see below
DEFIN_KEY Function: PF1–PF24

These program function keys are defined by the remote application program you are using. They request attention from the application program and send the data entered to the host. The PF keys are coded by the application program to perform functions relating to the application. A particular PF key may be coded differently from one application to another. The user's guide of the remote application program usually defines the specific PF key assignments for that application program.

<table>
<thead>
<tr>
<th>To Implement This Function</th>
<th>Press This Key or Key Combination</th>
</tr>
</thead>
<tbody>
<tr>
<td>PF1</td>
<td>PF1</td>
</tr>
<tr>
<td>PF2</td>
<td>PF2</td>
</tr>
<tr>
<td>PF3</td>
<td>PF3</td>
</tr>
<tr>
<td>PF4</td>
<td>KP7</td>
</tr>
<tr>
<td>PF5</td>
<td>KP8</td>
</tr>
<tr>
<td>PF6</td>
<td>KP9</td>
</tr>
<tr>
<td>PF7</td>
<td>KP4</td>
</tr>
<tr>
<td>PF8</td>
<td>KP5</td>
</tr>
<tr>
<td>PF9</td>
<td>KP6</td>
</tr>
<tr>
<td>PF10</td>
<td>KP1</td>
</tr>
<tr>
<td>PF11</td>
<td>KP2</td>
</tr>
<tr>
<td>PF12</td>
<td>KP3</td>
</tr>
<tr>
<td>PF13</td>
<td>EXT +PF1</td>
</tr>
<tr>
<td>PF14</td>
<td>EXT +PF2</td>
</tr>
<tr>
<td>PF15</td>
<td>EXT +PF3</td>
</tr>
<tr>
<td>PF16</td>
<td>EXT +KP7</td>
</tr>
<tr>
<td>PF17</td>
<td>EXT +KP8</td>
</tr>
<tr>
<td>PF18</td>
<td>EXT +KP9</td>
</tr>
<tr>
<td>PF19</td>
<td>EXT +KP4</td>
</tr>
<tr>
<td>PF20</td>
<td>EXT +KP5</td>
</tr>
<tr>
<td>PF21</td>
<td>EXT +KP6</td>
</tr>
<tr>
<td>PF22</td>
<td>EXT +KP1</td>
</tr>
<tr>
<td>PF23</td>
<td>EXT +KP2</td>
</tr>
<tr>
<td>To Implement This Function</td>
<td>Press This Key or Key Combination</td>
</tr>
<tr>
<td>----------------------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>PF24</td>
<td>EXT + KP3</td>
</tr>
</tbody>
</table>

**PLAY**

VT100: EXT + M  
VT200: Insert Here  

**DEFINE_KEY Function:** PLAY

Recalls keystroke sequences stored on PF keys using the RECORD function. Invoke the PLAY function and then press the PF key on which the desired key sequence is stored. The PLAY function executes all commands included in the keystroke sequence.

If the HELP utility is invoked in your key sequence, the PLAY function continues until you exit from the HELP utility. Also, if you use functions that require you to respond to prompts (such as ATTACH, DEF KEY, SET FIL, or SPAWN), the information you enter at the prompt is not recorded. When you recall the sequence, the system prompts you for this information again.

P appears on the status line if the status display is enabled.

**PRINT**

VT100: EXT + P  
VT200: F11  

**DEFINE_KEY Function:** PRINT

Records the contents of your screen in a file or at a printer. (This is a local print feature.) If the status display is enabled when you use the PRINT function, the word Print appears on the status line. Your screen refreshes when the printing process completes.

The first use of PRINT in a given run of TN3270 creates a new version of the output file. Successive uses of PRINT in the same program cause the screen contents to append to the existing file. If the output is directed to a printer, each use of PRINT creates a separate entry in the printer queue. If the printer is a spooled printer, the output is released for printing immediately.

Use the command qualifier /PRINTER=file to specify where to direct the output file. The SET FIL function allows you to change the name of the output file each time you invoke the PRINT function.

**RECORD**

VT100: EXT + L  
VT200: INSERT + Insert Here  

**DEFINE_KEY Function:** RECORD

Saves a keystroke sequence on a specific PF key. Invoke the RECORD function with the appropriate key sequence (as described above), press the PF key as prompted, enter the keystroke sequence, and then invoke the RECORD function again. You can save a maximum number of 127 keystrokes on each PF key. If the status display is enabled when you use the RECORD function, the letter R appears on the status line.

To recall the keystroke sequence, use the PLAY function. Use the DV CNCL function to cancel the RECORD function. To erase all previously recorded key sequences, use the ER INP function.
Establishing Network Terminal Sessions Using TELNET/TN3270

4.12 IBM 3270 Model Terminal Emulation (TN3270)

**REFR (refresh)**

VT100: Ctrl/W  
VT200: Ctrl/W or F20

**DEFINE_KEY Function: REFRESH**

Removes TN3270 error messages, operating system messages, or other messages that appear on your screen. This key function deletes extraneous characters from your screen and redispays the fields and data that were on the screen before the interruption.

This function does not transmit or receive data from the remote host. It is a local OpenVMS function.

**RESET**

VT100: KP0  
VT200: KP0

**DEFINE_KEY Function: RESET**

Returns the keyboard to normal input mode from insert mode. Also, the RESET function returns the keyboard to your control after it locks when you try to enter data in to a protected or a full field, or when you try to enter the wrong type of data in to a field.

Invoking RESET turns off the Inhib indicator. The cursor remains where it is and the screen remains unchanged.

**SELECT**

VT100: EXT + K  
VT200: Select

**DEFINE_KEY Function: SELECT**

Lets you choose items from a menu, table, or list and then notify the program of your selection. Use the arrow keys to position the cursor on the field designator character, then use the SELECT function. For more information on using SELECT, refer to the user’s guide of the remote application.

**SET FIL (set print file)**

VT100: EXT + F or Ctrl/F  
VT200: EXT + F11

**DEFINE_KEY Function: SET_PRINTFILE**

Lets you change the name of the file or device that receives output each time you invoke the PRINT function. After you invoke SET FIL, you are prompted for the name of a new output device, emulating the remote host’s IDENT function.

Note that if you specify the same name that is already in use, subsequent PRINT operations direct output to a new version of the same file.

**SHO MSG**

VT100: EXT + G  
VT200: EXT + F14

**DEFINE_KEY Function: SHOW_MESSAGE**

Displays the broadcast messages that have been posted on a separate screen. If the status line is enabled, Msg appears on the status line. If you do not read the messages before they fill up the screen, the messages begin to scroll up out of view and you will no longer be able to read them. These broadcast messages are not saved after you read them or exit TN3270.
SPAWN

VT100: EXT + D VT200: Find

DEFINE_KEY Function: SPAWN

Creates a subprocess under the current process. Use the LOGOUT command to terminate the subprocess. Because a tree of subprocesses can be established using the SPAWN function, you must be careful when terminating any process in the tree. When a process is terminated, all subprocesses below that point in the tree are terminated automatically.

When you create a subprocess, you can specify an optional command string. The command string is executed within the created subprocess and the subprocess terminates upon completion of the command.

STATUS

VT100: EXT + S VT200: F17

DEFINE_KEY Function: STATUS

Lets you enable and disable the display of status information.

When you enable STATUS, the last line on your screen is painted over with a reverse video strip. This line may conceal remote host system or application information. If this occurs, Hidden appears in the status line.

Disable the status display by using the STATUS function again.

SYS REQ (system request)

VT100: EXT + R VT200: EXT + F19

DEFINE_KEY Function: SYS_REQUEST

Lets you shift between the application program (the LU-LU session) and the control program (the SSCP-LU session). If the status display is enabled, Appl or SSCP appears on the status line to indicate the type of session. Appl appears when you are in an LU-LU session and SSCP appears when you are in the SSCP-LU session.

The screen is refreshed when you use the SYS REQ function.

Tab (Right arrow | )

VT100: Tab VT200: Tab

DEFINE_KEY Function: TAB

Moves the cursor to the first character location of the next unprotected field on your screen. If the screen has no fields, the Right arrow | function moves the cursor to the first location on the screen.

If the cursor is within the last unprotected field on the screen, the cursor moves to the first position of the first unprotected field on the screen.

Vertical Control (Up arrow and Down arrow)

VT100: Up arrow or Down arrow VT200: Up arrow or Down arrow

DEFINE_KEY Function: UP, UP_NOWRAP, DOWN, or DOWN_NOWRAP

Moves the cursor vertically on your screen without altering the data you have already entered.
Establishing Network Terminal Sessions Using TELNET/TN3270

4.12 IBM 3270 Model Terminal Emulation (TN3270)

If the cursor is at the:

- Top of the screen when you press the up arrow, the cursor appears in the same column at the bottom of the screen.
- Bottom of the screen when you press the down arrow, the cursor appears in the same column at the top of the screen.

If the screen display you receive is larger than 24 rows deep, you can use the Up arrow and the Down arrow keys to move through the display. These keys scroll the screen display up or down.

If you want the cursor to wrap to the opposite edge of the display, use the key sequence EXT + Up arrow or EXT + Down arrow.

4.12.8.0.1 Associated Documentation For additional information about TN3270 key functions, see the following IBM documents:

- IBM 3270 Information Display System, Order No. GA23-0060

4.12.9 Redefining Your Keyboard

You can reassign functions and keys.

4.12.9.0.1 Functions You Can Redefine You can redefine the following functions:

- All emulated functions
- Most IBM 3270 model functions
- All emulated alphanumeric and graphic characters

4.12.9.0.2 Keys You Can Define The keys you can define are listed in Table 4-6.

Table 4–6 TN3270: Definable Keys

<table>
<thead>
<tr>
<th>Location</th>
<th>Key Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Function keys (VT100 and VT200)</td>
<td>PF1–PF4</td>
</tr>
<tr>
<td>Application keypad (VT100 and VT200)</td>
<td>KP0–KP9, ENTER, MINUS, COMMA, PERIOD</td>
</tr>
<tr>
<td>Top-row function keys (VT200)</td>
<td>F6–F20, HELP (F15), DO (F16)</td>
</tr>
</tbody>
</table>
Establishing Network Terminal Sessions Using TELNET/TN3270
4.12 IBM 3270 Model Terminal Emulation (TN3270)

<table>
<thead>
<tr>
<th>Location</th>
<th>Key Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Editing keypad (E1–E6) (VT200)</td>
<td>FIND (E1)</td>
</tr>
<tr>
<td></td>
<td>INSERT_HERE (E2)</td>
</tr>
<tr>
<td></td>
<td>REMOVE (E3)</td>
</tr>
<tr>
<td></td>
<td>SELECT (E4)</td>
</tr>
<tr>
<td></td>
<td>PREV_SCREEN (E5)</td>
</tr>
<tr>
<td></td>
<td>NEXT_SCREEN (E6)</td>
</tr>
<tr>
<td>Cursor keys (VT100 and VT200)</td>
<td>UP</td>
</tr>
<tr>
<td></td>
<td>DOWN</td>
</tr>
<tr>
<td></td>
<td>LEFT</td>
</tr>
<tr>
<td></td>
<td>RIGHT</td>
</tr>
<tr>
<td>Control keys (VT100 and VT200)</td>
<td>Ctrl/A–Ctrl/Z, including:</td>
</tr>
<tr>
<td></td>
<td>Ctrl/H (BS)</td>
</tr>
<tr>
<td></td>
<td>Ctrl/I (HT)</td>
</tr>
<tr>
<td></td>
<td>Ctrl/J (LF)</td>
</tr>
<tr>
<td></td>
<td>Ctrl/M (CR)</td>
</tr>
<tr>
<td></td>
<td>Excluding:</td>
</tr>
<tr>
<td></td>
<td>Ctrl/Y—Interrupt</td>
</tr>
<tr>
<td></td>
<td>Ctrl/C—Cancel/interrupt</td>
</tr>
<tr>
<td></td>
<td>Ctrl/O—Output off/on</td>
</tr>
<tr>
<td></td>
<td>Ctrl/S—Suspend output</td>
</tr>
<tr>
<td></td>
<td>Ctrl/Q—Resume output</td>
</tr>
</tbody>
</table>

4.12.9.0.3 Keys You Cannot Define  You cannot redefine the following DIGITAL-reserved keys:

- Ctrl/Y — Interrupt
- Ctrl/C — Cancel/interrupt
- Ctrl/O — Output off/on
- Ctrl/S — Suspend output
- Ctrl/Q — Resume output
- F1–F5

4.12.9.0.4 Redefining Keys  To redefine a keyboard key, use either of the following methods:

- Create a key definition file, a text file with individual key definitions in the form of DEFINE/KEY statements and DELETE/KEY statements (see Section 4.12.9.0.5).
- Use the DEF KEY function (see Section 4.12.9.0.6).

The following example establishes a TELNET/TN3270 connection to host JUNCO. By default, the terminal functions as if it were an IBM-3278-2 model terminal. It uses your customized keyboard definition file NEW_KEYS.DAT.

$ TN3270 JUNCO /KEY_DEFINITION=NEW_KEYS.DAT
4.12.9.0.5 Creating a Key Definition File  Use the DEFINE/KEY and DELETE/KEY statements to create your own key definition file as described in the following sections.

**DEFINE/KEY Statement**
The DEFINE/KEY statement assigns a new function to a particular key. Its format is:

```
DEFINE/KEY [/STATE=EXTEND] key_name function
```

- **STATE**  
  Optional. Default: non-extend mode. Redefines the key in extend mode.
- **key_name**  
  Standard key name on the DIGITAL terminal.
- **function**  
  TN3270 function you want mapped to this key.

You can define most of the named keys both in normal (non-extend) mode and in extend mode.

You can define the control keys (and the synonyms for them) only in normal mode. Do not specify the qualifier /STATE=EXTEND.

The following example assigns the EXIT function to the key sequence EXT + Z:

```
DEFINE/KEY/STATE=EXTEND "Z" EXIT
```

**DELETE/KEY Statement**
The DELETE/KEY statement removes the function assigned to a particular key. Its format is:

```
DELETE/KEY [/STATE=EXTEND] key_name
```

- **STATE**  
  Optional. Default: nonextend mode. Deletes the key in extend mode.
- **key_name**  
  Standard key name on the DIGITAL terminal.

**Example:**  
The following example removes the default value of EXIT from Ctrl/Z.

```
DELETE/KEY Ctrl/Z
```

**Key Definition File: Example**

By default, TN3270 maps 3270 functions to the numeric keypad.

The following example shows key definition statements in a key definition file. The definitions restore the numeric keypad on a VT220 keyboard.

```
DEFINE/KEY KP0 "0"
DEFINE/KEY KP1 "1"
DEFINE/KEY KP2 "2"
DEFINE/KEY KP3 "3"
DEFINE/KEY KP4 "4"
DEFINE/KEY KP5 "5"
DEFINE/KEY KP6 "6"
DEFINE/KEY KP7 "7"
DEFINE/KEY KP8 "8"
DEFINE/KEY KP9 "9"
DEFINE/KEY period "."  
DEFINE/KEY comma ","  
DEFINE/KEY minus "-"  
DEFINE/KEY Select extend  
DEFINE/KEY Prev_screen reset
```
This example restores the key normally associated with the EXT function (KP) as the keypad decimal point. When you assign a key another function, you remove its default value. Therefore, because some TN3270 functions rely on an EXT function, the EXT function is defined to correspond to the Select key. This example also restores the key normally associated with the RESET function (KP0) as the keypad 0 key. The example then defines the RESET function to correspond to the Prev Screen key.

4.12.9.0.6 Interactive Definitions: DEF KEY Function Use the DEF KEY function to define or redefine a key interactively. Your new definition exists until you log out from the remote host or disconnect from it.

When you invoke the DEF KEY function, TN3270 displays a prompt in the status line at the bottom of your screen.

Example: The following example shows the use of DEF KEY to define a key. You invoke the DEF KEY function by entering the Ctrl/K sequence, after which you are prompted for the key you want to define and the function to assign to that key.

Press the key that you want to define:

Enter the function name or quoted character:

You can also use DEF KEY to remove an assigned function. A null reply to the following prompt removes the definition currently in effect for that key:

Enter the function name or quoted character:

What you enter during the DEF KEY dialog is subject to translation from the National Character Set to the DIGITAL Multinational Character Set.

You cannot redefine a key that exists on your National Character Set terminal if it lacks a DIGITAL Multinational Character Set equivalent.

4.12.9.1 TN3270 Problem Solving

During a TELNET session in which you have invoked TN3270, you might experience the following problems:

Problem

• The keyboard keys do not work properly.
• Messages, such as the status line messages, do not appear in reverse video.
• You receive a message indicating that your terminal is an unsupported model.
  You cannot use TN3270 on a VT131 model terminal that is running in block mode.

Solution for a VT100-Series Terminal Use Set-Up mode to verify that your terminal is in ANSI mode. Issue the following command:

$ SET TERMINAL /INQUIRE

Solution for a VT200-Series Terminal or a Terminal Connected to Either a DIGITAL Personal Computer or a Workstation

1. Use Set-Up mode to verify that your terminal is:
  • In ANSI mode
  • Set to VT100 or VT200 emulation mode
2. Check the Communications Menu:
The terminal communications line must be set for 8-bit characters. To check, issue the following command:

$ SET TERMINAL /INQUIRE

**Solution for a Terminal with a National Language Keyboard** Ensure that your terminal is set up to correspond to your keyboard.

**Problem**
You receive a message indicating that the screen size (or the alternate screen size) specified by the remote host is too big.

**Solution** Use Set-Up mode to change to a valid screen size (see Section 4.12.1).

**Problem**
You try to use the RECORD or PLAY function, but you get an error message indicating that you have a bad key sequence file.

**Solution** The file that stores the recorded key sequence is incompatible with the current version of the software or is corrupted.

Ask your system manager to do either of the following:
- Correct TCPIPSRECSEQ.DAT in your SYS$LOGIN directory.
- Delete TCPIPSRECSEQ.DAT.
  If the system manager must delete this file, rerecord all the key sequences you had stored on the PF keys.

**4.12.10 Debugging Application Programs Using the IBM 3270 Model Terminal Emulator**

Visible attribute mode provides a way to debug application programs. After you use the DSP ATT (display attributes) function to enable visible attribute mode, all attribute characters are visible. Attribute characters are characters that appear at the start of a field to indicate the following information:

- How the field appears on the screen:
  - At normal intensity
  - At high intensity
  - Invisibly
- What type of data the application expects in the field:
  - Numeric
  - Alphabetic
  - Alphanumeric

The following information shows:
- How to enter and exit visible attribute mode (see Section 4.12.10.0.1).
- The screen displays (see Section 4.12.10.0.2).
4.12.10.0.1 Entering and Exiting Visible Attribute Mode   The displays described in this section rely on your terminal’s ability to produce reverse video and bold characters.

Invoking the DSP ATT function toggles in and out of visible attribute mode.

- The first time you press this key combination:
  - The screen refreshes.
  - The attribute characters appear either in reverse video or underlined.

- The second time you press DSP ATT:
  - You turn off this mode.
  - The screen refreshes and returns to normal mode.

4.12.10.0.2 Visible Attribute Mode Displays   The attribute characters are displayed in reverse video, bold symbols. Attribute characters indicating numeric fields are also underlined. All other characters are displayed normally. Table 4–7 lists the attribute characters and their meanings.

<table>
<thead>
<tr>
<th>Character</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>n</td>
<td>Unprotected field with normal intensity follows</td>
</tr>
<tr>
<td>N</td>
<td>Protected field with normal intensity follows</td>
</tr>
<tr>
<td>d</td>
<td>Following unprotected field is light-pen-detectable</td>
</tr>
<tr>
<td>D</td>
<td>Following protected field is light-pen-detectable</td>
</tr>
<tr>
<td>h</td>
<td>Following unprotected field has high intensity</td>
</tr>
<tr>
<td>H</td>
<td>Following protected field has high intensity</td>
</tr>
<tr>
<td>i</td>
<td>Unprotected nondisplay field follows</td>
</tr>
<tr>
<td>I</td>
<td>Protected nondisplay field follows</td>
</tr>
</tbody>
</table>

4.13 Command Descriptions

To start TELNET, issue either the TELNET command or the TN3270 command at the DCL prompt.

To use TELNET commands, enter them at the TELNET> prompt.

This section provides complete descriptions of each TELNET command. The related ENABLE and DISABLE commands are presented together (see the description for ENABLE).
TELNET Command Reference

CONNECT

CONNECT
Establishes a TELNET connection between your local system and a remote host. You can run one session or up to ten simultaneous sessions (only one session if you invoke TN3270).

DCL-Style Format

CONNECT  host [ port* [ terminal_type ] ]
* Required if you specify terminal type.

UNIX Style Format

open  host [ port ] [ terminal_type ]

Parameters

host
Required.
Remote host to which you want to connect.

port
Optional without terminal_type.
Required with terminal_type.
Default: 23.
TELNET port on the remote host. Specify this parameter if:
• You are invoking TN3270.
• You are connecting to a host that does not use the standard TELNET port.

terminal_type
Optional. Default: model of your physical terminal.
Terminal model that you want your physical terminal to function as. Specify one of the following:
• For a session running TN3270, the terminal model to emulate. Enter one:
  – IBM-3278-2
  – IBM-3278-3
  – IBM-3278-4
  – IBM-3278-5
• For a non-TN3270 session, any terminal type recognized by the remote host, such as VT100, VT200, VT300, VT400, and VT500.

Examples

1. TELNET> CONNECT MYBUD
   Establishes a TELNET connection to remote host MYBUD.
2. TELNET> CONNECT DEBTS 23 IBM-3278-2
   Establishes a TELNET connection to remote host DEBTS and runs TN3270. Your terminal functions as an IBM-3278-2 model terminal. For syntactical reasons, specifying a port number is required.

3. TELNET> CONNECT 130.180.5.5
   Establishes a TELNET connection to the host at IP address 130.180.5.5.

4. TELNET> CONNECT REVIN 31
   Establishes a TELNET connection to remote host revin. The connection is at port 31 on revin.

5. % Ctrl/\ (characters not echoed)
   TELNET> CONNECT QUIK
   .
   .
   %
   During a TELNET session with a UNIX host, pressing Ctrl/\ escapes to the TELNET prompt. Another CONNECT command establishes a second session, this one to UNIX host quik.
BIND_SESSION

Creates a TELNET terminal device (TNAx: ) and connects to a network device (BGx: ). If successful, returns the TNA device name (TNAx: ) in the DCL symbol $TELNET_DEVICE. Network input and output operations may then be performed through the created TELNET device using terminal driver $QIO operations.

DCL-Style Format

BIND_SESSION network_device [ /PROTOCOL=option ]

Parameters

network_device
Required.
An existing network device.

Qualifiers

/PROTOCOL=option
Optional. Default: NONE.
Where option is:

• NONE
  Data is sent with no interpretation (raw).

• NVT
  Network Virtual Terminal (NVT), TELNET’s internal representation of a standard network terminal. NVT format is standard 7-bit ASCII code transmitted in 8-bit octets, the canonical form of data representation used by both the client and server.

• TELNET
  Standard TELNET protocol.

• RLOGIN
  Standard RLOGIN protocol.

Example

TELNET> BIND_SESSION BG393: /PROTOCOL=NVT
CREATE_SESSION

Establishes an outbound TELNET pseudodevice (network terminal) and connects it to a remote listener (port).

DCL-Style Format

CREATE_SESSION host port [ unit ]
[ [ / NO ]TIMEOUT=option ]
[ /PROTOCOL=option ]

Parameters

host
Required.
Remote host to which you want to connect.

port
Required.
TELNET port on the remote host.

unit
Optional. Default: 0
The decimal number specifying the unit number for the pseudodevice (TNAx).
The default "0" specifies that the DIGITAL TCP/IP Services for OpenVMS software should pick the next available unit number. If the requested unit number is already in use, the DIGITAL TCP/IP Services for OpenVMS software picks the next available unit number. In all cases, the software notifies you of the unit number chosen.

Qualifiers

/TIMEOUT
/NOTIMEOUT
Optional. Default: /NOTIMEOUT

• /TIMEOUT
  Creates a TNA device which has the following connection attributes:

  • NOIDLE—The connection is broken when the device is finally deassigned. The device will automatically reconnect when data is written to it.
  • IDLE—Specifies the idle time for the device. If the device is idle for at least the specified amount of time (note that the time has a granularity of one second), then the connection will be broken. Idle means that the device has neither received nor set any data for the idle period.
  • NORECONNECTION—The device does not automatically retry reconnections if they fail.
  • RECONNECTION—When data is written to the device and it is not connected, this value determines the interval between reconnection attempts. For example, if an application writes to a TNA with a RECONNECTION:0:1:00, then if the first connection attempt fails, subsequent connection attempts will be made in one-minute intervals.
TELNET Command Reference
CREATE_SESSION

- /NOTIMEOUT
  Creates a TNA device which breaks the connection when the device is finally deassigned (the last channel assignment is deassigned).

/PROTOCOL=\textit{options}
Optional. Default: NONE. Options include:

- NONE
  Data is sent with no interpretation (raw).

- NVT
  Network Virtual Terminal (NVT), TELNET's internal representation of a standard network terminal. NVT format is standard 7-bit USASCII code transmitted in 8-bit octets, the canonical form of data representation used by both the client and server.

- TELNET
  Standard TELNET protocol.

- RLOGIN
  Standard RLOGIN protocol.

Example

\texttt{TELNET> CREATE\_SESSION DEBTS 23 2}
Establishes a network terminal known as TNA2 and connects this device to port 23 on remote host DEBTS.

\texttt{TELNET> CREATE\_SESSION /TIMEOUT=(NOIDLE, RECONNECTION=NN)}
Creates a device which disconnects on deassignment and reconnects when data is written to it.

\texttt{TELNET> CREATE\_SESSION /NOTIMEOUT}
Creates a device that is not reusable: the device disconnects on deassignment and is deleted.

\texttt{TELNET> CREATE\_SESSION /TIMEOUT=(IDLE=0:0:30, RECONNECTION=0:2:00)}
Creates a device which times out after being idle for 30 seconds and which retries connection attempts at 2 minute intervals.
DELETE_SESSION

Deletes an outbound TELNET pseudodevice (network terminal) created by the CREATE_SESSION command. If the device was not created with the CREATE_SESSION command, the command returns an error.

DCL-Style Format

DELETE_SESSION unit

Parameters

unit
Required.

The decimal number specifying the unit number of the pseudodevice (TNx) to be deleted.

Example

TELNET> DELETE_SESSION 2
Deletes the network terminal known as TNA2.
TELNET Command Reference

DISCONNECT

Terminates the current remote connection.

If you terminate a session with a remote OpenVMS host, the connection is closed by your local host. However, the process on the remote host is still running. To terminate it, issue a LOGOUT command.

DCL-Style Format

DISCONNECT

UNIX Style Format

close
ENABLE (DISABLE) AUTOFLUSH

Enables or disables the automatic flushing of output when you send the interrupt character.

- **Enabled** — The data in the data buffer remains visible until the buffer is empty.
- **Disabled** — The data buffer is emptied and the display is terminated. This provides fast system response to the interrupt character.

Default: ENABLE AUTOFLUSH.

**DCL-Style Format**

```plaintext
ENABLE AUTOFLUSH
DISABLE AUTOFLUSH
```

**UNIX Style Format**

```plaintext
toggle autoflush
```
ENABLE (DISABLE) AUTOSYNCH

Enables or disables the sending of the synchronization and interrupt characters in urgent mode.

- **Enabled** — The local host sends an interrupt character in urgent mode, and the remote host immediately processes it.
- **Disabled** — TELNET sends the interrupt character in sequence with the other characters in the stream, and the remote host processes this character in the sequence received.

Default: DISABLE AUTOSYNCH.

**DCL-Style Format**

```
ENABLE AUTOSYNCH
DISABLE AUTOSYNCH
```

**UNIX Style Format**

```
toggle autosynch
```
ENABLE (DISABLE) BINARY

Enables or disables the transmission of data in binary mode.

- **Enabled** — The EOL (end-of-line) character is not mapped to Return LF (the carriage return / line feed combination).
  
  Use ENABLE BINARY when the remote host expects each line to end with a carriage return / line feed combination.
  
  Binary mode provides interaction when the remote host:
  - Expects special characters
  - Does not support automatic negotiation of the TELNET binary option

- **Disabled** — EOL is sent as Return LF (the carriage return / line feed combination).

  Default: DISABLE BINARY.

**DCL-Style Format**

```
ENABLE BINARY
DISABLE BINARY
```

**UNIX Style Format**

```
toggle binary
```
ENABLE (DISABLE) CRLF

Enables or disables the sending of carriage returns as Return LF (the carriage return / line feed combination) at the end of each line.

• Use **ENABLE CRLF** if the remote host expects Return LF at the end of each line.

• Use **DISABLE CRLF** if the remote host interprets Return as Return LF, which is CR mode.

Default: ENABLE CRLF.

**DCL-Style Format**

ENABLE CRLF
DISABLE CRLF

**UNIX Style Format**

toggle crlf
**ENABLE (DISABLE) CRMOD**

Enables or disables the mapping of received carriage returns. With this mapping, the remote host sends each line with Return LF (the carriage return / line feed combination) at the end of each line.

- Use **ENABLE CRMOD** if your terminal expects each line to end with Return LF.
- Use **DISABLE CRMOD** if your terminal expects Return null at the end of each line.

Default: DISABLE CRMOD.

**DCL-Style Format**

Enable CRMOD

DISABLE CRMOD

**UNIX Style Format**

toggle crmod
ENABLE (DISABLE) DEBUG

Enables or disables the display of data in hexadecimal.

- **Enabled** — Data is displayed in both hexadecimal and readable text.
- **Disabled** — Data is displayed in readable text.

Default: DISABLE DEBUG.

**DCL-Style Format**

```
ENABLE DEBUG
DISABLE DEBUG
```

**UNIX Style Format**

```
toggle netdata
```

**Example**

```
% Ctrl-Z (characters not echoed)
TELNET> enable debug Return
TELNET> display Return
.
.
Will print network data flow in hexadecimal
.
.
TELNET>) resume Return
SEND [ 0] D A
RCVD [ 0] D A
RCVD [ 0] 746E7069782E6C6B672E6465632E6F66696E677572617A73696F6E73
% ls Return
SEND [ 0] 6C
RCVD [ 0] 6C 1
SEND [ 0] 73
RCVD [ 0] 73 s
SEND [ 0] D A
RCVD [ 0] D A
RCVD [ 0] 62696E20202020202020...RCVD [32] 7074 DA
french.estud.oiseau russian.estud.ptitsa fences typescript verio
%
```

Escapes from a session with a UNIX host, enables debug mode, resumes the session, and asks for a list of files in the working directory. Both hexadecimal data and readable data are displayed.
ENABLE (DISABLE) LOCAL_CHARS

Enables or disables the translation of the following terminal control characters into TELNET protocol sequences:

- Interrupt
- Flush Output
- Are You There
- Kill
- Erase
- Quit

With local characters:

- **Enabled** — The local host sends the control characters (listed above) translated into TELNET sequences. For example, Ctrl/T becomes IAC AYT.

  Enabled mode is appropriate when the remote and local hosts implement different control characters. The remote host does not recognize certain control characters. Therefore, the local host interprets these control characters before sending them to the remote host.

- **Disabled** — The local host sends these control characters uninterpreted. They are interpreted by the remote host.

  Before you communicate in disabled mode, ensure that the remote and local hosts use the same control characters.

Default: DISABLE LOCAL_CHARS.

**DCL-Style Format**

```
ENABLE LOCAL_CHARS
DISABLE LOCAL_CHARS
```

**UNIX Style Format**

```
toggle localchars
```
ENABLE (DISABLE) OPTIONS_VIEW

Enables or disables the display of option negotiations between the local system and the remote host during the session.

- **Enabled** — TELNET displays the option negotiations between your local system and the remote host.
- **Disabled** — TELNET does not display the option negotiations. This mode is suitable for most communications.

Default: DISABLE OPTIONS_VIEW.

DCL-Style Format

```
ENABLE OPTIONS_VIEW
DISABLE OPTIONS_VIEW
```
EXIT

Closes any open sessions, exits from TELNET, and returns to the DCL prompt. If you terminate a session with a remote OpenVMS host, the connection is closed by your local host. However, the process on the remote host is still running. To terminate it, issue a LOGOUT command.

DCL-Style Format

EXIT

UNIX Style Format

quit
HELP

Displays online help for TELNET or TN3270 commands.

Format

HELP [ dcl_style_telnet_command ]

Parameters

dcl_style_telnet_command
Optional.
Specific TELNET command about which you want information.

Examples

1. TELNET> HELP CONNECT
   This command provides information about the CONNECT command.

2. TELNET> HELP OPEN
   This command displays: Sorry, no documentation on OPEN.
   To get help for a command, enter the command name using DCL style.
RESUME

Resumes an open TELNET or TN3270 session that you interrupted with the escape sequence. When you run simultaneous multiple sessions (TELNET only):
- To resume a particular session, specify a session number.
- To resume the active session, omit the session number.
- If no session is active, you must specify a session number.

Note
TELNET interprets the active session as the last session with which you communicated. If that communication ended with you logging out, you have no active sessions. However, you might have other waiting (alive) sessions.

DCL-Style Format
RESUME [session_number]

UNIX Style Format
Return

Parameters

session_number
Optional. Default: the active session.

Use session_number when you run multiple TELNET sessions. It resumes the session with the specified number.

Examples

1. $ [\backslash Ctrl/\backslash ] (characters not echoed)
   TELNET> SHOW STATUS
   Session 1 Active Host FINDER
   .
   .
   .
   TELNET> RESUME
   $ This example:
   - Starts at the prompt of remote OpenVMS host FINDER.
   - Escapes from FINDER and returns to the local TELNET prompt.
   - Issues SHOW STATUS, which displays one active session.
   - Returns to FINDER's prompt.
2. % [Ctrl/
] (characters not echoed)
TELNET> SHOW STATUS
Session 2 Active Host LUNA
.
.
Session 1 Waiting Host SOLAR
TELNET> RESUME 1
%

This example:
• Starts at the prompt of UNIX host luna.
• Escapes from luna.
• At the TELNET prompt, issues SHOW STATUS, which displays two active sessions, the active one with luna and another with host solar, whose status is "waiting."

The RESUME 1 command returns to "waiting" host solar.
SEND AO

SEND AO (Abort Output) aborts the output of the last remote command you entered, while the command continues to execute. If you issue another SEND AO, the output resumes if the command is still executing.

Use this command when:

• The remote host does not recognize Ctrl/O as the flush output character.
• You want to terminate the output but not the execution of the process.

DCL-Style Format

SEND AO

UNIX Style Format

send ao

Example

% cd /bin
% ls -l
total 3464
-rwxr-xr-x 2 root 32768 Oct 19 1996 STTY
-rwxr-xr-x 2 root 5120 Oct 19 1996 [Ctrl] (characters not echoed)

TELNET> SEND AO
^O
%

During a directory listing, the TELNET escape sequence (not echoed to the screen) returns to TELNET prompt. The SEND AO command aborts the UNIX ls command.
SEND AYT (Are You There) reports if you are still connected to an established connection.

DCL-Style Format
SEND AYT

UNIX Style Format
send ayt

Example

```
% [Ctrl/](characters not echoed)
TELNET> SEND AYT
[Yes]  [Return]
%  [Return]
```
SEND BRK

SEND BRK (Break) terminates execution of the last command you entered at the remote host.

Use this command when the remote host does not recognize Ctrl/C as an interrupt character.

DCL-Style Format

SEND BRK

UNIX Style Format

send brk

Example

```
% cd /bin
% ls -l
total 1464
-rwxr-xr-x 2 root 32768 Oct 19 1988 STTY
-rwxr-xr-x 2 root 5120 Oct 19 1988 [ 
-rwxr-xr-x 1 root 45056 Oct 19 1988 adb
-lwxr-xr-x 1 root 13 Aug 21 17:41 ar -> ../usr/bin/ar
-lwxr-xr-x 1 root 13 Aug 21 17:41 as -> ../usr/bin/as
[Ctrl]/ (characters not echoed)
TELNET> SEND BRK
```

This example:

- Issues the UNIX `ls` command.
- Issues the TELNET escape sequence.
- Issues the TELNET SEND BRK command, which terminates execution of `ls` at the remote host.
SEND EC

SEND EC (Erase Character) deletes the last character you typed at the remote host.
Use this command when the remote host does not recognize your Delete key.

DCL-Style Format

SEND EC

UNIX Style Format

send ec

Example

% Mail [Ctrl/](characters not echoed)
TELNET> SEND EC [Return]
Mail $Revision 4.2.4.2 $ Type ? for help.
"/usr/spool/mail/debts": 1 message 1 new
> N debts Tue Sep 15 13:39 8/161 "Team Building"

This example:

- Misspells the UNIX Mail command.
- Enters the TELNET escape sequence (not echoed to the screen) to return to the TELNET prompt.
- Enters the TELNET SEND EC command, which deletes the last character (l) typed and returns to the remote host.
SEND EL

SEND EL (Erase Line) deletes the last line of text you entered on the remote host.

Use this command when the remote host does not recognize your Delete key or command-line recall.

**DCL-Style Format**

SEND EL

**UNIX Style Format**

send el

**Example**

```
% mail [Esc] (characters not echoed)
TELNET> SEND EL [Return]
% Mail
Mail version 2.18 5/19/83. Type ? for help.
"/usr/spool/mail/finder": 1 message 1 new
>N 1 finder Tue Sep 15 13:39 8/161 "Getting Together"
&
```

This example:

- Misspells the UNIX Mail command.
- Enters the TELNET SEND EL command, which deletes the incorrect line mail and returns you to the remote host.
- Enters the Mail command.
SEND GA

SEND GA (Go Ahead) signals the remote host that your local system is ready. Some applications require GA commands in either one or both directions. (Usually, Go Ahead is suppressed so sending a GA has no effect.)

DCL-Style Format

SEND GA

UNIX Style Format

send ga
SEND IP

SEND IP (Interrupt Program) interrupts the execution of the last command you entered on the remote host. The interrupt character clears the input and output paths to the remote host. The remote host interrupts the program that is processing. (This command has no effect in binary mode.)

Use this command if either your terminal or the remote host does not recognize the default interrupt character, Ctrl/C.

DCL-Style Format
SEND IP

UNIX Style Format
send ip
SEND NOP

SEND NOP (No Operation) tells you whether your local host can send data to the remote host and the remote host can receive the data. If you:

- Get an %TELNET-E-INETERROR error message, there is a problem with the connection; the remote host is not able to receive data.
- Get an %TELNET-S-REMCLOSED status message, the connection with the remote host has been closed.
- Do not get an error message, the connection is active.

DCL-Style Format
SEND NOP

UNIX Style Format
send nop

Examples

1. % Ctrl/A (characters not echoed)
   TELNET> SEND NOP
   %TELNET-I-SESSION, Session 01, host nyx, port 23
   No error message indicates the connection is active. (The information message also indicates the connection is active.)

2. % Ctrl/A (characters not echoed)
   TELNET> SEND NOP
   %TELNET-S-REMCLOSED, Remote connection closed
   -TELNET-I-SESSION, Session 01, host nyx, port 23
   TELNET>
   Indicates your connection has been broken.
SEND SYNCH

The SEND SYNCH command clears the communications path between your local system and the remote host. The SYNCH is sent in urgent mode (out-of-band, OOB). As a result:

1. The local host immediately sends an interrupt character, placing it at the front of the data stream sent to the remote host.

2. The remote host immediately processes the interrupt character, ignoring any incoming data not yet processed, and then including a TELNET synchronization or interrupt character in the data stream it sends back to the local host.

3. The local host throws away all incoming data (rather than processing that data) until it detects the synchronization or interrupt character. This provides faster response time to the synchronization and interrupt characters.

DCL-Style Format

SEND SYNCH

UNIX Style Format

send synch
TELNET Command Reference

SET ECHO

SET ECHO

Sets the echo character.

Use this command if either your terminal or the remote system does not recognize
the default echo character. Enter:

1. Opening quotation marks
2. A circumflex ( ^ )
3. The new echo character
4. Closing quotation marks

DCL-Style Format

SET ECHO "^character"

UNIX Style Format

set echo "^character"

Parameters

"^character"

Required.

Character you want to use as the echo character.

Example

TELNET> SET ECHO "^m"
Echo character is ‘^M’.

Sets the echo control character to either m or M.
SET ERASE

Sets the erase character.
The erase character deletes, either locally or remotely, the last character in the type-ahead buffer. (This character has no effect in binary mode.)

Use this command if either your terminal or the remote system does not recognize the default erase character, the Delete key.

Enter:
1. Opening quotation marks
2. A circumflex ( ^ )
3. The new erase character
4. Closing quotation marks

**DCL-Style Format**

```
SET ERASE "^character"
```

**UNIX Style Format**

```
set erase "^character"
```

**Parameters**

```
"^character"
```

Required.
Character you want to use as the erase character.

**Example**

```
TELNET> SET ERASE "^P"
Erase character is ' ^p'.
Sets the erase control character to either p or P.
```
SET ESCAPE

Sets the escape character.
The escape character returns you to the TELNET prompt. When you run multiple sessions, you can set different escape sequences for each connection.
Use this command if either your terminal or the remote system does not recognize the default escape character, Ctrl/\.
Enter:
1. Opening quotation marks
2. A circumflex ( ^ )
3. The new escape character
4. Closing quotation marks

DCL-Style Format

SET ESCAPE "^character"

UNIX Style Format

set escape "^character"

Parameters

"^character"
Required.
Character you want to use as the escape character.

Example

TELNET> SET ESCAPE "^p"
Escape character is ’^p’.
Sets the escape control character to either p or P.
SET FLUSHOUTPUT

Sets the flush output character.

Use this command if either your terminal or the remote host does not recognize
the default flush output character, Ctrl/O.

Enter:
1. Opening quotation marks
2. A circumflex ( ^ )
3. The new flush output character
4. Closing quotation marks

DCL-Style Format

SET FLUSHOUTPUT \""character\"

UNIX Style Format

set flushoutput \""character\"

Parameters

\""character\"
Required.
Character you want to use as the flush output character.

Example

TELNET> SET FLUSHOUTPUT \""P\"
Flush output character is \'\'p\'.

Sets the flush output control character to either p or P.
SET INTERRUPT

Sets the interrupt character.

The interrupt character clears the input and output paths to the remote host. The remote host interrupts the program that is processing. (This character has no effect in binary mode.)

Use this command if either your terminal or the remote host does not recognize the default interrupt character, Ctrl/C.

Enter:
1. Opening quotation marks
2. A circumflex ( ^ )
3. The new interrupt character
4. Closing quotation marks

DCL-Style Format

SET INTERRUPT "^character"

UNIX Style Format

set interrupt "^character"

Parameters

"^character"

Required.

Character you want to use as the interrupt character.

Example

TELNET> SET INTERRUPT "^a"
Interrupt character is "^A".

Sets the interrupt control character to either a or A.
SET KILL

Sets the kill character.
The kill character discards, both locally and remotely, the entire type-ahead buffer. (This character has no effect in binary mode.)
Use this command if either your terminal or the remote host does not recognize the default kill character, Ctrl/U.
Enter:
1. Opening quotation marks
2. A circumflex ( ^ )
3. The new kill character
4. Closing quotation marks

DCL-Style Format

SET KILL "^character"

UNIX Style Format

set kill "^character"

Parameters

"^character"
Required.
Character you want to use as the kill character.

Example

TELNET> SET KILL "^q"
Kill character is ‘^Q’.
Sets the kill control character to either q or Q.
SET MODE

Sets the mode of transmission.

The mode of transmission can be either character mode or line mode. Character mode is the default. Use character mode when you run a character-processing text editor on the remote host. With character mode, your local system sends data a character at a time to the remote host with which you have a connected session, and the remote host echoes the characters back for display on your local system. (Sometimes several characters may be sent in a burst for performance optimization, in which case the remote server usually replies with bursts of characters, but not a line at a time.)

To use line mode, the remote host server must support line mode. The local host echoes characters. Line mode allows the following:

- Signal trapping (such as for application programs on remote UNIX hosts that sense traps or special events)
- Local character editing
- Tab expansion (where a tab is more than simply the TAB character)

This command overrides the ENABLE LOCAL_CHARS command.

Before you issue this command, establish a remote connection.

DCL-Style Format

SET MODE {CHAR | LINE}

UNIX Style Format

mode mode

Parameters

CHAR
LINE

Required.

Transmission mode you want to set. Specify either of the following:

- CHAR — Data is transmitted one character at a time.
- LINE — Data is transmitted one line at a time.
SET QUIT

Sets the quit character, an alternate interrupt character.

DCL-Style Format

SET QUIT "^character"

UNIX Style Format

set quit "^character"

Parameters

"^character"
Required.
Character you want to use as the quit character.

Example

TELNET> SET QUIT "^i"
Quit character is ‘^I’.
Sets the alternate interrupt control character to either i or I.
SET TERMINAL

Sets the default terminal type for future TELNET or TN3270 connections.

Format

```
SET TERMINAL /DEVICE=type
```

Qualifiers

```
/DEVICE=type
```
Required.
Terminal model. Specify one of the following:
• A DIGITAL terminal model
• An IBM terminal to emulate. Enter the full specification for one of these:
  - IBM-3278-2
  - IBM-3278-3
  - IBM-3278-4
  - IBM-3278-5

Example

```
TELNET> SET TERMINAL /DEVICE=IBM-3278-2
Terminal type is set to IBM-3278-2
TELNET>
```

Runs TN3270. The terminal is emulating an IBM 3278-2 model terminal.
SHOW DEVICE
Displays status information about TELNET devices.

DCL-Style Format
SHOW DEVICE [ device_name ] [ /FULL ]

Parameters
device_name
Optional. TNA device name. For example, TNA245:

Qualifiers
/FULL
Optional.
Shows detailed information about TNA devices on the local system.

Example
TELNET> SHOW DEVICE TNA281:
TNA281: BG9526: Temporary condor:23 freebid:1033
Displays status of a particular TNA device.

TELNET> SHOW DEVICE
TELNET> show device
TELNET> show device
1 2 3 4 5
TNA10: BG495: Temporary condor:23 freebid:1059
TNA12: BG658: Temporary condor:23 pigdog:1455
TNA13: BG671: Temporary condor:23 pigdog:1456
TNA35: BG2993: Temporary condor:23 projector:1044
TNA37: BG2999: Temporary condor:23 pigdog:1459
TNA38: BG3000: Temporary condor:23 pigdog:1470
TNA47: BG3393: Temporary condor:23 1-22-222-37.*.com:1069
TNA58: BG3866: Temporary condor:23 pcruth.mel.dec.com:1043
TNA60: BG3910: Temporary condor:23 1-20-244-54.*.com:1635
TNA61: BG3932: Temporary condor:23 lexser3.1ex.de:com:1093
TNA62: BG3933: Temporary condor:23 tcpipa:1801
TNA63: Temporary
Displays status of all TNA devices on the local system. Command output includes:
1 The TNA device (terminal device)
2 The associated BG device (network device)
3 Whether the TNA device is permanent or temporary
4 Local host name and port number
5 Remote host name and port number
TELNET Command Reference
SHOW DEVICE

TELNET> SHOW DEVICE/FULL

Device TNA7:
Access port name: "Host: 16.99.999.140 Port: 1310"
Characteristics: (none)
Connection attempts: 0 (tries)
Connection interval: 0 (seconds)
Connection timeout: 0 (seconds)
Data high limit: 512 (bytes at VCI port)
Data low limit: 256 (bytes at VCI port)
Idle interval: 0 (seconds)
Idle timeout: 0 (seconds)
Network device name: BG266:
Protocol: TELNET
Local address: 16.99.999.100 (condor)
    port: 23
Remote address: 16.99.999.140 (pigdog.dec.com)
    port: 1310
Service type: None

Displays detailed information on all TNA devices which exist on the local system. The information shown in the example is output for each TNA device.
SHOW PARAMETERS

Displays current TELNET or TN3270 parameter settings. If you run multiple sessions, the display applies to the active session.

DCL-Style Format

SHOW PARAMETERS

UNIX Style Format

display

Example

TELNET> SHOW PARAMETERS
Will flush output when sending interrupt characters
Won’t send interrupt characters in urgent mode
Will map carriage return on output
Won’t recognize certain control characters
Won’t show option negotiation
Won’t print network data flow in hexadecimal
[^] echo
[^?] erase
[^O] flushoutput
[^C] interrupt
[^U] kill
[^Y] quit
[^T] areyouthere
TELNET>
TELNET>

Displays the parameter settings for the active session, revealing that:

- Automatic flushing (AUTOFLUSH) of output is enabled.
- Sending of interrupt characters in urgent mode (AUTOSYNCH) is disabled.
- Mapping of received carriage returns (CRMOD) is enabled.
- Mapping of carriage returns as Return LP on output (CRLF) is disabled.
- Interpretation of control characters (LOCAL_CHARS) is enabled. The remote host does not recognize certain control characters; therefore, the local host interprets them.
- Display of option negotiations (OPTIONS_VIEW) between the local and remote hosts is disabled.
- The display or printing of data in hexadecimal (DEBUG) is disabled. Therefore, TELNET displays the data in readable text only.
- The control characters are interpreted as listed.
SHOW SESSION

Displays the session information about your current TELNET sessions (or TN3270 session) and, if you are running multiple TELNET sessions, about the waiting sessions.

DCL-Style Format

SHOW SESSION

UNIX Style Format

status

Examples

1. TELNET> SHOW SESSION
   %TELNET-E-NOSESSION, No active session
   TELNET> CONNECT LUNA
   %TELNET-I-Trying, Trying... 192.1.2.3
   %TELNET-I-SESSION, Session 01, host luna, port 23
   -TELNET-I-Escape, Escape character: ‘\[’
   LUNA -- Unauthorized access is prohibited
   Username: BURNS
   Password: (password not echoed)
   Welcome to OpenVMS Alpha Version 7.1 on node LUNA
   $ [ctrl/a] (characters not echoed)
   TELNET> SHOW SESSION
   Session 01, host LUNA, port 23 (default active port)
   TELNET>

   Displays information about current sessions. The information returned for the first SHOW SESSION command reveals that the local host has no active sessions. The user then connects to host LUNA and returns to the TELNET prompt to display session information once again. This time, the SHOW SESSION command displays information about the connection with LUNA.

2. TELNET> CONNECT ESTRELLA 23 IBM-3278-2
   
   % [ctrl/a] (characters not echoed)
   TELNET> SHOW SESSION
   Session 01, host LUNA, port 23
   Session 02, host ESTRELLA, port 23 (default active session)
   TELNET>

   Here, the same user has established another connection, this time to host ESTRELLA. The SHOW SESSION command displays information about all sessions, revealing that the current active session is with host ESTRELLA.
SHOW STATUS

Displays the status of the current TELNET or TN3270 session and, if you are running multiple sessions, about the waiting sessions. Status information may include information about open sessions such as: which one is active and which one(s) are waiting, the escape character and options currently set, and the number of data overruns and suspended network I/Os (inputs/outputs) detected.

DCL-Style Format

SHOW STATUS

UNIX Style Format

status

Examples

1. TELNET> SHOW STATUS
   No open sessions
   Escape character: ‘^]’

   TELNET> CONNECT LUNA
   %TELNET-I-Trying, Trying ... 192.1.2.3
   %TELNET-I-SESSION, Session 01, host LUNA, port 23
   %TELNET-I-Escape, Escape character: ‘^]’
   LUNA -- Unauthorized access is prohibited
   Username: BURNS
   Password: (password not echoed)
   Welcome to OpenVMS Alpha Version 7.1 on node LUNA
   $ [^A] (characters not echoed)
   TELNET> SHOW STATUS
   Session 1 Active Host LUNA Port 23
   Operating Mode: Character-at-a-time
   Escape character: ‘^]’
   Options:
   Echo - Remote
   Terminal Type - Local
   Terminal Type - VT300
   Suppress Go Ahead - Local
   Suppress Go Ahead - Remote
   Terminal Dataoveruns: 0
   Suspended Network I/Os: 0

   TELNET>

   Session 1 Active Host LUNA
   Operating Mode: Character-at-a-time
   Escape character: ‘^]’
   Options:
   Echo - Remote
   Terminal Type - Local
   Terminal Type - DEC-VT300
   Suppress Go Ahead - Local
   Suppress Go Ahead - Remote
   Terminal Dataoveruns: 0
   Suspended Network I/Os: 0
TELNET Command Reference
SHOW STATUS

TELNET>

The user enters a SHOW STATUS command to discover that no active sessions have been established. After the user connects to host LUNA, the next SHOW STATUS command displays information about the active session with LUNA.

2. TELNET> CONNECT ESTRELLA 23 IBM-3278-2
.
.
%
(chars not echoed)
TELNET> SHOW STATUS
Session 2 Active Host ESTRELLA Port 23
Operating Mode: Character-at-a-time
Escape character: ‘^]’
Options:
  Echo - Remote
  Terminal Type - Local
  Terminal Type - VT300
  Suppress Go Ahead - Local
  Suppress Go Ahead - Remote
Terminal Dataoveruns:  0
Suspended Network I/Os:  0

Session 1 Waiting Host LUNA Port 23
TELNET>

Here, the user has established an additional session, this time with host ESTRELLA. The SHOW STATUS command displays information about the currently active session with ESTRELLA and the waiting session.
SPAWN

Suspends your current TELNET or TN3270 session and returns you to the local DCL prompt.
To resume your session, log out at the DCL prompt.

DCL-Style Format

SPAWN

UNIX Style Format

z

Example

% date
Fri Sep 11 14:16:39 EDT 1998
% ^[\ ] (characters not echoed)
TELNET> SPAWN

$ SHOW TIME
   11-Sep-1998 14:16:41
   
   
   
$ LOGOUT
   Process GROUP_1 logged out at 11-Sep-1998 14:27:18.63

TELNET> RESUME

In this example, the user returns to the TELNET prompt from the active session with a remote UNIX host. The user then enters the SPAWN command and, at the DCL prompt, displays the time and several other commands (not shown) before logging out and returning to the TELNET prompt to resume the active session.
TELNET Command Reference

TELNET

TELNET

DCL-Style Format

TELNET [ host ] qualifier(s)* [ port ] [ unit ]

*Choose from the following qualifiers:
[ /BIND_SESSION network_device /PROTOCOL=protocol ]
[ /CREATE_SESSION [ /NO TIMEOUT=option ] /PROTOCOL=option ]
[ /DELETE_SESSION ]
[ /LOG_FILE=file ]
[ /NOINTERACTIVE ]
[ /PORT=n ]
[ /TERMINAL_TYPE=type ]
[ /UNBIND_SESSION ]

UNIX Style Format

telnet [ host ]

Parameters

host
Required with the /CREATE_SESSION qualifier; optional in all other cases. Default: None.
Remote host to which you want to connect. Specify one of the following:

- Host name
- IP address

port
Required with the /CREATE_SESSION qualifier; ignored in all other cases. Default: None.
Specifies the remote port to which you want to connect the pseudodevice.

unit
Required with the /DELETE_SESSION qualifier; optional with the /CREATE_SESSION qualifier; ignored in all other cases. Default: 0.
With the /CREATE_SESSION qualifier, specifies the unit number you want associated with the network terminal. The default of 0 allows the TELNET software to select the next available unit number.
With the /DELETE_SESSION qualifier, specifies the unit number of the network terminal you want to delete.
Qualifiers

/BIND_SESSION network_device
Optional. Default: None.

Binds a TELNET terminal device to an existing network device. If the bind is successful, the DCL symbol $TELNET_DEVICE contains the TNA device name.

/CREATE_SESSION
Optional. Default: None.

Specifies that TELNET should create a pseudodevice (network terminal) and connect it to the specified remote port. For additional information, see the CREATE_SESSION command.

/NOTIMEOUT
/TIMEOUT=option

Where option is:

NOIDLE
IDLE=delta_time_interval

Specifies the delta time interval to wait with no activity before closing the connection. The general delta time format is HH:MM:SS:CC.

NORECONNECT
RECONNECT=delta_time_interval

Specifies the delta time interval to wait before retrying a connect request. The general delta time format is HH:MM:SS:CC.

/PROTOCOL=option
Optional. Default: NONE.

where option is:

• NONE
  Data is sent with no interpretation (raw).

• NVT
  Network Virtual Terminal (NVT), TELNET's internal representation of a standard network terminal. NVT format is standard 7-bit ASCII code transmitted in 8-bit octets, the canonical form of data representation used by both the client and server.

• TELNET
  Standard TELNET protocol.

• RLOGIN
  Standard RLOGIN protocol.

/DELETE_SESSION
Optional. Default: None.

Specifies that TELNET should delete the specified pseudodevice (network terminal). For additional information, see the DELETE_SESSION command.
TELNET Command Reference

TELNET

/LOG_FILE=file
Optional. Default: No logging.
An optional log file that contains all session output. Using this option does not affect your terminal output. You cannot use this option for TN3270 sessions.

/NOSTRICTIVE
Optional. Default: TELNET command mode.
Disables the capability of using the escape character to leave a session and return to the TELNET prompt. This option is useful when the TELNET command is referenced in a command procedure in a captive account.

/PORT=n
Optional. Default: 23.
Remote port to which you want your TELNET process to connect. Specify only if you are connecting to a host that does not use the standard TELNET port.

/TERMINAL_TYPE=type
Optional. Default: None.
The IBM or DIGITAL terminal to emulate. Enter the full specification for one of these terminals:
- IBM-3278-2
- IBM-3278-3
- IBM-3278-4
- IBM-3278-5
- VT100
- VT200
- VT300
- VT400
- VT500

/UNBIND_SESSION network_device terminal_device
Optional.
Unbinds a network device (BGx:) from a TELNET terminal device (TNAx:) that was initially bound by a BIND_SESSION command or qualifier.

Examples

1. $ TELNET
   TELNET> ENABLE DEBUG
   TELNET> SET TERMINAL /DEVICE=VT300
   Terminal type is set to VT300
   TELNET> CONNECT DEBTS

   In this example, the TELNET command:
   - Starts TELNET.
   - Customizes the environment.
- Establishes a connection to host DEBTS and sets up the terminal type as VT300.

2. `$ TELNET MYCOM /TERMINAL_TYPE=IBM-3278-2`  
   Establishes a TELNET connection to remote host MYCOM and runs TN3270.

3. `$ TELNET 130.180.5.5`  
   Establishes a TELNET connection to the host at IP address 130.180.5.5.

4. `$ TELNET UCOM 31`  
   Establishes a TELNET connection to remote host ucom at port 31.
TN3270

Starts a TELNET session that runs TN3270 and does one of the following:

- Displays the TELNET prompt.
- Establishes a connection to a remote host.

Format

```
TN3270 [ host ]
[ /CHARACTER_SET=file ]
[ /KEY_DEFINITIONS=file ]
[ /NATIONAL_CHARACTERS=char_set ]
[ /NOMODM ]
[ /PORT=n ]
[ /PRINTER=file ]
[ /STATUS=state ]
[ /TERMINAL_TYPE=IBM-3278-n ]
```

Parameters

`host`
Optional.

Remote host to which you want to connect. Specify one:

- Host name
- IP address

Qualifiers

`/CHARACTER_SET=file`
Optional. Default: ORIGINAL.

File with the EBCDIC-to-DMCS (DIGITAL Multinational Character Set) and the DMCS-to-EBCDIC translation tables.

If you omit this qualifier, TN3270:

- Uses the translation table named by the default file SY$LIBRARY:TN3270DEF.TBL, if your system manager has created it.
- Defaults to its own translation table, if TN3270DEF.TBL does not exist. The default table maps the US EBCDIC set to the equivalent DMCS characters.

If none of these translation tables meets your needs, the system manager can generate a new translation table. (See the DIGITAL TCP/IP Services for OpenVMS Management manual for information about the EBCDIC / DMCS translation tables.)

_________________________ Note ____________________________
To reset the default, do not abbreviate ORIGINAL.
/KEY_DEFINITIONS=file
Optional. Default: default keyboard layout.
Keyboard definition file you created to redefine how the TN3270 key functions correspond to your keyboard layout. This file holds the definitions for alternative keyboard mapping.

/NATIONAL_CHARACTERS=character_set
Optional. Defaults: For 8-bit terminals: MULTINATIONAL
For 7-bit terminals: US_ASCII.
National Replacement Character Set (NRCS) for which your DIGITAL terminal is configured. Specify one of the following:
- Canadian MULTINATIONAL
- Dutch Norwegian
- Finnish Spanish
- French Swedish
- German Swiss
- Italian UK_ASCII
- Japanese US_ASCII

/NOINTERACTIVE
Optional. Default: TELNET command mode.
Disables the capability of using the escape character to leave a session and return to the TN3270 prompt. This option is useful when the TN3270 command is referenced in a command procedure in a captive account.

/PORT=n
Optional. Default: 23.
Remote port to which you want your TELNET/TN3270 process to connect. Specify only if you are connecting to a host that does not use the standard TELNET port.

/PRINTER=file
Optional. Default: TN3270PRINT.LIS.
File that records your screen's contents when you use the PRINT function.
Directs printer output to either a file or a spooled printer (not a physical printer or terminal).

/STATUS=state
Optional. Default: AUTOMATIC.
Determines how the status line operates during your session. Specify one of the following:
- AUTOMATIC Status line is displayed.
The status line is disabled automatically if the remote host writes data to the area under the status line or you type in that space.
The status line is restored automatically when the data is erased.
- ON Status line is always displayed.
- OFF Status line is not displayed.
To toggle between ON and OFF, invoke the STATUS function.

/TERMINAL_TYPE=IBM-3278-n
IBM terminal to emulate. Enter the full specification for one of the following:
- IBM-3278-2
- IBM-3278-3
- IBM-3278-4
- IBM-3278-5

Examples

1. $ TN3270 MYCOM
   Establishes a TELNET connection to remote host MYCOM. By default, the physical terminal functions as an IBM-3278-2 model terminal.

2. $ TN3270 130.180.5.5 /TERMINAL_TYPE=IBM-3278-3 -
   _$ /KEY_DEFINITIONS=MY_NUMPAD.FIL
   Establishes a TELNET connection to the host at IP address 130.180.5.5. The terminal functions as if it were an IBM-3278-3 model terminal, and it uses the customized keyboard definition file MY_NUMPAD.FIL.

3. $ TN3270 UCOM 31 /TERMINAL_TYPE=IBM-3278-5 /PRINTER=LOG
   Establishes a TELNET connection to remote host ucom:
   - The connection is at port 31 on ucom.
   - The terminal is functioning as if it were an IBM-3278-5 model terminal.
   - During the session at ucom, using the PRINT function records the screen's contents in a file named LOG.LIS.
UNBIND_SESSION

Unbinds a network device (BGx:) from a TELNET terminal device (TNAx:) that was previously bound with a BIND_SESSION command or qualifier.

DCL-Style Format

UNBIND_SESSION network_device terminal_device

Parameters

network_device
Required.
Network device (BGx:) to unbind.

terminal_device
Required.
Associated terminal device (TNAx:).

Example

TELNET>
TNA458: BG2032: Temporary condor:4009 angel:23
TNA460: BG4739: Temporary condor:23 ler13.dec.com:1037
TNA463: Temporary
TELNET> UNBIND_SESSION BG2032: TNA458:
TELNET>
Sending and Receiving E-Mail Using SMTP

For exchanging electronic mail (e-mail) with users working on internet hosts, the DIGITAL TCP/IP Services for OpenVMS product includes Simple Mail Transfer Protocol (SMTP) and Post Office Protocol (POP) software.

What You Can Do
The following table lists the SMTP electronic mail services you can perform and the sections that explain how to use them.

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What You Need
To use the DIGITAL TCP/IP Services for OpenVMS mail services, you need the following:
- Knowledge of the OpenVMS Mail utility
- User names and IP addresses of the people to whom you want to send mail

5.1 Obtaining Online Help
You can obtain online help for DIGITAL TCP/IP Services for OpenVMS electronic mail by entering the following command:

$ HELP TCPIP_SERVICES SMTP
5.2 Sending Mail

To send e-mail to another internet host also running SMTP, simply invoke the OpenVMS Mail utility at the DCL prompt, type SEND at the MAIL> prompt, and enter the destination. A remote destination consists of the user name followed by an ampersand (@ and the host (such as user_name@host). If the user is on your local host, omit the ampersand (@ and host name.

```
$ MAIL
MAIL> SEND
To: destination_user@destination_host
```

Specify the destination host as either a host name or an IP address. The following example sends mail to user MALCOLM at host PHILOS.BU.EDU:

```
$ MAIL
MAIL> SEND
To: malcolm@philos.bu.edu
Subj: Final Exams
```

The following example sends mail to user MALCOLM at the host with IP address 16.20.40.59:

```
$ MAIL
MAIL> SEND
To: malcolm@16.20.40.59
Subj: Final Exams
```

The OpenVMS Mail utility automatically detects destination addresses that include fully qualified host names (where the node component includes a period (.), such as MALCOLM@PHILOS.BU.EDU) and sends the mail using the SMTP protocol, unless your system has been set up to use a different Internet protocol (by defining an alternate protocol with the MAIL$INTERNET_TRANSPORT logical name).

However, if you use a destination address that is not fully qualified — that is, one in which the node component does not include a period (.) — the Mail utility by default assumes the address is a DECnet address. For example, if you specified MALCOLM@PHILOS as the destination address, the Mail utility converts it to the DECnet format PHILOS::MALCOLM.

You can force the OpenVMS Mail utility to use a specific protocol by defining the MAIL$INTERNET_MODE logical name. This is useful in cases where a mail address, such as MALCOLM@PHILOS, can be valid for either SMTP or DECnet.

You can assign one of the following values to the MAIL$INTERNET_MODE logical name:

- **SMTP**
  
  Mail always interprets the node component of an unqualified address as an Internet address specification. (SMTP is the default mode unless you define an alternate Internet transport with the MAIL$INTERNET_TRANSPORT logical name.)

- **DECNET**
  
  Mail always interprets the node component of an unqualified address as a DECnet node specification.

- **HYBRID** (the default)
Mail uses an Internet protocol if the node component of the address contains a period. If no periods are in the node component, Mail uses the DECnet protocol.

Define the logical name in your LOGIN.COM file. For example, the following definition causes the Mail utility to interpret any address that does not include a period in the node component of the specification as an Internet address:

```$ DEFINE MAIL$INTERNET_MODE SMTP```

Another way to force the OpenVMS Mail utility to use SMTP is to include the SMTP% prefix. At the To: prompt, type SMTP% and, with no space, either the destination name or IP address. Enclose the destination in quotation marks, as in the following example:

```$ MAIL
MAIL> SEND
To: SMTP%"malcolm@philos"
```

So, if you want to prevent the OpenVMS Mail utility from automatically converting an unqualified Internet host name address to a format for DECnet use, you have three choices:

- Fully qualify the host name (for example, specify MALCOLM@PHILOS.BU.EDU instead of MALCOLM@PHILOS).
- Define the MAIL$INTERNET_MODE logical name as SMTP.
- Include the SMTP% prefix and the destination address in quotation marks (for example, SMTP%"MALCOLM@PHILOS.BU.EDU").

For more information on the OpenVMS Mail utility and how it interprets addresses, see the appropriate OpenVMS documentation.

### 5.3 Sending Mail to Multiple Users

To send mail to more than one user, use the SEND command as discussed in the previous section, but at the To: prompt type one of the following:

- A list of names (Section 5.3.1)
- The name of an existing distribution list (Section 5.3.2)

#### 5.3.1 Entering a List of Names

When you type a list of names, use the following guidelines:

- Separate each name with a comma ( , ).
- If multiple users are on the same remote host, type the full user_name@host combination for each user.
- If a user is on your local host, omit the ampersand (@) and host.

Use the following syntax:

```MAIL> SEND
To: user1,user2,user3@host3,user4@host4
```

where:

- user1 is located at the local OpenVMS system.
- user2 is located at the local OpenVMS system.
- user3 is located at host3.
- user4 is located at host4.
5.3 Sending Mail to Multiple Users

MAIL> SEND
To: user1@host5, user2@host5

In this example, both users are located at remote host5.

The following example sends the same mail to:

• Users NOWAK and BRENT on host CENTRAL.GREEN.ORG
• User MILLER on host BOSTON.GREEN.ORG

MAIL> SEND MEETINGS.TXT
To: NOWAK@CENTRAL.GREEN.ORG, BRENT@CENTRAL.GREEN.ORG, MILLER@BOSTON.GREEN.ORG
Subj: SCHEDULE AND AGENDAS

5.3.2 Distribution Lists

To send mail to multiple users by entering the name of a distribution list, follow these guidelines:

• The file with the distribution list can be yours or belong to someone else.
• The file can reside locally or remotely.
• Do not include the names of other distribution lists in the distribution list.

You can use two kinds of distribution lists:

• OpenVMS distribution list
  – Create a .DIS file in your own directory or use an existing one.
  – You can include comment lines (lines preceded by an exclamation mark (!)).
  – You can include both OpenVMS addresses and SMTP addresses. If you want the Mail utility to use SMTP for all SMTP addresses, qualified and unqualified, either set the MAIL$INTERNET_MODE logical name to SMTP, specify fully qualified SMTP addresses only, or use the SMTP% prefix with the destination enclosed in quotation marks.
  – To send mail to the people on your distribution list, enter:

    MAIL> SEND
    To: @list_name

• SMTP distribution list
  – Create, or use an existing, .DIS file in SYS$SPECIFIC:[TCPIP$SMTP] or, if defined on your system, TCPIP$SMTP_COMMON:.
  – Give the list a unique name that is not the same as a local user name.
  – Specify comment lines with an exclamation mark (!) in the first column.
  – Include only SMTP addresses.
  – Use one address per line.
  – To send mail to the people on this distribution list, enter the following command:

    MAIL> SEND
    To: list_name@host_where_list_resides
If the MAIL$INTERNET_MODE logical name is not set to SMTP, specify a fully qualified host name or use the SMTP% prefix with quotation marks enclosing the distribution list/host specification.

The following examples show some different methods of using distribution lists.

1. This example sends mail to users whose names are on the local OpenVMS distribution list AGENCIES.DIS. The distribution list file is displayed in this example. The MAIL$INTERNET_MODE logical name is not set, so by default unqualified Internet addresses would be sent over DECnet; therefore, the AUDUBON@NY address is included with the SMTP% prefix and quotation marks.

   $ TYPE AGENCIES.DIS
   
   !
   ! This is an OpenVMS distribution file named AGENCIES.DIS.
   !
   SMTP%"audubon@ny"
   WILLIAMS@BELTWAY.ORG
   WILDLIFE@DALLAS.ORG
   jmuir@19.8.7.6
   SEC@GP.INTER8.ORG
   BATES::SCOPE
   
   $ MAIL
   MAIL> SEND
   To:       AGENCIES.DIS
   Subj:     NEWS TO WATCH FOR

2. This example sends mail to users whose names are on the local SMTP distribution list SYS$SPECIFIC:[TCPIP$SMTP]NATL_INTEREST.DIS. The distribution list file is displayed in this example.

   $ TYPE NATL_INTEREST.DIS
   
   green@19.8.7.6
   wlf@19.7.6.5
   arlo@19.4.3.2
   free::monicaL
   wendell@biolo.ne.edu
   $ MAIL
   MAIL> SEND
   To:       natl_interest@main_office.org
   Subj:     News Items

3. This example sends mail to the users on SMTP distribution list FINANCE_CENTERS.DIS, which is maintained on remote mail server host HOLBROOK.

   $ TYPE FINANCE_CENTERS.DIS
   
   ny_accts@23.9.7.4
   sf_stocks@23.7.11.2
   dallas_pfs@23.1.5.1
   denver_accts@holbrook
   $ MAIL
   MAIL> SEND
   To:       finance_centers@holbrook
   Subj:     Portfolio Activity
5.4 Receiving Mail

To read received mail, follow these steps:

1. At the DCL prompt, type MAIL.
2. At the MAIL> prompt, use the DIRECTORY command to view a list of received messages.
3. Use the READ command or indicate the message number you want to view in exactly the same way as you would for OpenVMS mail.

In the following example, a user views the directory of unread new mail and selects Message 3 to read.

$ MAIL
You have 3 new messages.
MAIL> DIRECTORY
NEWMAIL
# From Date Subject
1 GWAY::SMTP%"helenm@bhc 10-MAR-1998 Just Checking In
2 GWAY::SMTP%"mays@sfg 11-MAR-1998 Common Bases
3 CBIRD::SMTP%"seaway 12-MAR-1998 Cruises
MAIL> 3

5.5 OpenVMS Mail Personal Name String

You can define a "personal name" string that is included at the top of all the mail messages you send. To create a personal name with SMTP mail, use the SET PERSONAL_NAME command with the following restrictions:

- Enclose the string in quotation marks.
- Do not use additional double quotation marks within the string.
- You may use single quotation marks (').
- Do not use 8-bit ASCII characters, for example, ä or ö. The eighth bit is truncated. For example, ä becomes d and ö becomes v.

The following example shows a user setting a personal name that includes quotation marks:

$ MAIL
MAIL> SET PERSONAL_NAME "'Wellth' is in the mind"

5.6 Carbon-Copying Messages

You can enable "carbon copying" by using the SET CC-PROMPT command. Follow these guidelines when you specify destinations for the CC: prompt:

- Follow the OpenVMS Mail conventions for copying mail to other people or to yourself.
- For entering the correct address, follow the guidelines listed in Section 5.2.
The following example sends mail to user AL and carbon copies users ROLLINS, BOND, and RICH:

MAIL> SEND
To: al@airways
CC: rollins,bond,rich@flight_central.com
Subj: Directions for Night Flight

In the following example, OpenVMS user BRODIE sends mail to UNIX user owens and copies soltau.

MAIL> SET CC_PROMPT
MAIL> SEND
To: owens@kezar
CC: soltau@fgtoo.bonkers.org
Subj: Goals for the Week
Enter your message below. Press CTRL/Z when complete, or CTRL/C to quit:

RC: Let’s get a jump on the ball this time.
We’ll meet before the conference to organize.
- J.B. (not echoed) 

5.7 Forwarding Messages

You can forward any mail you receive to any internet host. Follow the OpenVMS Mail conventions for forwarding mail.

If you move to another system that supports SMTP, SMTP can forward your mail to your new location. When you set this feature, type the new address within three sets of quotation marks.

Use the following syntax:

MAIL> SET FORWARD _Address:SMTP%"new_user_name@forwarding_host"

In the following example, user CYGNET sets automatic SMTP forwarding from host NOW to user ELLIS at host FUTURE:

MAIL> SET FORWARD /USER=now::cygnet _Address:SMTP%"ellis@future"

5.8 Using the UNIX to UNIX Copy Program

The UNIX to UNIX Copy Program (UUCP) lets a system copy files to and from other systems running UUCP. UUCP is usually used to copy files over a dialup connection (see Section 5.8.1).

To route mail using UUCP, ask your system manager to define the general gateway in the SMTP configuration.

To use SMTP to route mail to a system running UUCP, address the mail as follows:

MAIL> SEND
To: SMTP%"user_name!uucp_host"

The following example sends mail to geoffrey at host haldir:

$ MAIL
MAIL> SEND
To: SMTP%"geoffrey!haldir.of.com"
5.8 Using the UNIX to UNIX Copy Program

5.8.1 Dialup Connections

Ask your system manager if you need to specify a gateway host in mail addresses when you work on UNIX to UNIX Copy Program (UUCP) dialup lines.

The following example sends mail during a dialup connection by specifying a gateway host:

```
MAIL> SEND
To: gateway_host!crandle!watts
CC: billw,jenny,ibis
Subj: Events Schedule
```

5.9 Management Commands for Mail

You can use the management commands described in Table 5-1 to help you work with SMTP mail messages currently in a queue. Type these commands at the TCPIP> prompt.

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<tr>
<th>Command</th>
<th>Function</th>
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<td>Deletes mail messages that are in holding state in SMTP queues</td>
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<tr>
<td>SEND MAIL</td>
<td>Releases for delivery a mail message that is in a holding state</td>
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The following subsections describe how to use these commands. For full command descriptions, see the DIGITAL TCP/IP Services for OpenVMS Management Command Reference.

5.9.1 Displaying SMTP Mail Status Information

Use the SHOW MAIL command to display information about SMTP mail, such as:

- Message (entry) number of the queued mail
- User name of the sender (to display information about other users, you need SYSPRV or BYPASS privileges)
- File name of the queued mail
- Status of a message

The following examples show how to display SMTP mail status information.

1. The following command displays information about message 826 in an SMTP queue. By default, the command returns brief information. Specify /FULL for more detailed information, as in the example that follows.

```
$ TCPIP SHOW MAIL /ENTRY=826
SMTP Mail Queue Entry  826   User: MARLOW
File: _PLUTOSDKDO:[MARLOW]970207015114579_MARLOW.TCPIP_PLUTO;1
Status: Processing
```

2. The following command displays detailed information about all your mail. The /RECIPIENT qualifier, used with the /FULL qualifier, displays selected classes of information, depending on the =option value you specify:
### 5.9 Management Commands for Mail

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALL</td>
<td>Shows failed, sent, and unsent messages</td>
</tr>
<tr>
<td>FAILED</td>
<td>Shows messages that could not be read for a particular recipient</td>
</tr>
<tr>
<td>SENT</td>
<td>Shows successful deliveries to a particular recipient</td>
</tr>
<tr>
<td>UNSENT</td>
<td>Shows messages that, as yet, are unsent</td>
</tr>
</tbody>
</table>

```
$ TCPIP
TCPIP> SHOW MAIL /FULL /RECIPIENT=ALL
SMTP Mail Queue Entry: 826 User: MARLOW
File: _PLUTO$DKD0:[MARLOW]970207015114579_MARLOW.TCPIP_PLUTO;1
Status: Processing
Message Destinations:
    Address: marlow@pluto
Message Headers:
    Return Path: ???
SMTP Mail Queue Entry: 828 User: MARLOW
File: _PLUTO$DKD0:[MARLOW]970207015114580_MARLOW.TCPIP_PLUTO;1
Status: Holding
Message Destinations:
    Address: marlow@pluto
Message Headers:
    Return Path: ???
```

#### 5.9.2 Deleting Holding State Mail Messages from SMTP Queues

The following examples show how to delete mail messages from SMTP queues, using the TCPIP REMOVE command (similar to the DCL DELETE/ENTRY command).

**Note**

Use this command only to release mail messages that are being held; do not use this command to delete mail messages in the processing state.

1. The following example deletes mail message 828, a message that is holding (the message corresponds to your process’s user name, or you have SYSPRV or BYPASS privileges). You are prompted to confirm that you want the message deleted.

   ```
   $ TCPIP REMOVE MAIL /ENTRY=828
   _PLUTO$DKD0:[MARLOW]970207015114580_MARLOW.TCPIP_PLUTO;1? y
   ```

2. This next example removes all messages for your process’s user name, or deletes everything in the SMTP queue if you have either SYSPRV or BYPASS privileges. The /NOCONFIRM qualifier prevents DIGITAL TCP/IP Services for OpenVMS from prompting you for confirmation. Before deletion, DIGITAL TCP/IP Services for OpenVMS copies this queued mail to the specified directory.

   ```
   $ TCPIP REMOVE MAIL /NOCONFIRM /COPY=[MARLOW.OLD_MAIL]
   ```
5.9 Management Commands for Mail

5.9.3 Releasing Holding State SMTP Mail Messages for Delivery

The following example shows how to requeue an SMTP mail message that is currently holding, using the TCPIP SEND MAIL command (similar to the DCL ENTRY/RELEASE command). You are prompted to confirm you want the mail message requeued.

```
$ TCPIP SEND MAIL /ENTRY=828
_PLUTODKDO:[MARLOW]970207015114580_MARLOW.TCPIP_PLUTO;1? y
```

5.10 Using Mail from Your PC

With SMTP and the Post Office Protocol (POP) functionality, you can receive and send OpenVMS mail from your PC.

POP is a mail repository that accepts and stores your mail even when the PC is turned off. At your request, the POP server reads mail from your OpenVMS NEWMAIL folder, then moves the mail to your MAIL folder.

To send and receive mail on your PC, make sure the system manager has configured the POP server for use on your PC (the POP client system).

To set up your POP client account, use one of the following methods:

- On networks where maximum security is not required, enter your PC mail application and configure a user name and password in to the system.
  The user name and password pair becomes authorization information for the TCP/IP system, not your POP client system. Your PC client sends the password to the POP server unencrypted.
  As an added security measure, POP permits only two user name and password authorization attempts per TCP connection.

- On networks where maximum security is required, enter your PC mail account and configure a user name and shared-secret password into the system.
  This method is called the APOP authorization method where you store a shared-secret password in a one-line file named POP_SECRET.DAT in your default OpenVMS mail directory.
  You can use the DCL command CREATE or your text editor to create the file and specify a password string, then set the file protection to prevent other users from accessing it. For example:

```
$ SET DEFAULT USER$DISK:[JONES.MAIL]
$ CREATE POP_SECRET.DAT
xyztancreff
$ SET FILE/PROT=(s,w,g,o:rwed) POP_SECRET.DAT
```

The shared-secret password cannot exceed 500 characters.

Each time you enter your PC mail application, the shared-secret string is sent from the PC client to the POP server using an encryption process.

For more information about the POP process, including information about how POP builds SMTP-compliant mail headers, see the DIGITAL TCP/IP Services for OpenVMS Management guide.
The Line Printer/Line Printer Daemon (LPR/LPD) of the DIGITAL TCP/IP Services for OpenVMS software supports the DCL PRINT, LPQ, and LPRM commands for remote printing.

The LPR/LPD service allows you access to print queues on remote hosts and allows users on remote hosts to access print queues on your system.

What You Can Do
The following table lists network printing services you can perform and the sections that explain how to use them.

<table>
<thead>
<tr>
<th>Capability</th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Send print jobs to a printer connected to a remote internet host</td>
<td>6.1</td>
</tr>
<tr>
<td>Display print queue status</td>
<td>6.2</td>
</tr>
<tr>
<td>Cancel print jobs</td>
<td>6.3</td>
</tr>
<tr>
<td>Receive on local (OpenVMS system) print queues print jobs initiated from a user on a UNIX system</td>
<td>6.4</td>
</tr>
<tr>
<td>Get a “finished” notification through SMTP mail</td>
<td>6.1.2.2</td>
</tr>
</tbody>
</table>

What You Need
To use the DIGITAL TCP/IP Services for OpenVMS network printer services, you need the following:

- The name of the remote print queue
- DEC Remote Print Server LPD protocol extensions software to enter PRINT /PARAMETERS=options=value
- TCP/IP Services for OpenVMS must be installed and LPR/LPD enabled on your OpenVMS system.

Command Summary
To use the remote printing features, enter the commands summarized in Table 6–1 (for complete command descriptions, see Section 6.6).

Table 6–1  Network Printing Commands: Summary

<table>
<thead>
<tr>
<th>DCL Command</th>
<th>UNIX Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRINT (See the OpenVMS documentation.)</td>
<td>lpr (See the UNIX documentation.)</td>
<td>Prints files</td>
</tr>
<tr>
<td>LPQ</td>
<td>lpq</td>
<td>Displays the status of a remote print queue</td>
</tr>
<tr>
<td>LPRM</td>
<td>lprm</td>
<td>Removes jobs from a remote print queue</td>
</tr>
</tbody>
</table>
6.1 Printing at Remote Print Queues

Your system manager can configure your system with LPR/LPD network services that allow you to use the DCL PRINT command to send print jobs to a print queue on a remote internet host. The remote host can be a UNIX system or another OpenVMS system running LPR/LPD.

You print a local file at a printer on a remote host by specifying the remote queue name defined on your local host (see your system manager for queue names). LPD copies the file to the appropriate remote printer's spool directory. A copy of the file to be printed remains in the spooling queue until the printer is ready to print it.

When you enter the DCL PRINT command to send a print job to a remote print queue, you use the /QUEUE qualifier to specify the queue name plus any of the following qualifiers:

/AFTER /BACKUP /BEFORE
/BY_OWNER /CONFIRM /COPIES
/CREATE /DELETE /EXCLUDE
/EXPIRED /FORM /HEADER
/HOLD /IDENTIFY /OBJ_COUNT
/MODIFIED /NAME /NOTE
/OPERATOR /PARAMETERS /PASSALL
/PRIORITY /QUEUE /SETUP
/SINCE /USER /WIDTH

Two of these qualifiers work differently with DIGITAL TCP/IP Services for OpenVMS software than they do in a OpenVMS environment without TCP/IP support. These two qualifiers are:

• /FORM
• /PARAMETERS

The following sections discuss the unique features of these two qualifiers when used for remote printing.

Note

DIGITAL TCP/IP Services for OpenVMS software does not support layup definition files for print requests to remote print queues. A layup definition file sets up the layup features: borders, sheet margins, alternating margins, pages per sheet, first page, page order, and page grid.

6.1.1 PRINT Command: /FORM Qualifier

The DCL PRINT /FORM command customizes the look of the printed page. This qualifier associates a form other than the default with the print job.

To see which forms are defined for your system, enter:

```
$ SHOW QUEUE /FORM
```
To find out the currently mounted form or the default form, enter:

```
$ SHOW QUEUE queue /FULL
```

If the FORM associated with a remote LPD queue specifies a /WIDTH value that is not the standard 132, LPD sends a "W" card in the job's control file with the width specified in the form.

### 6.1.2 PRINT Command: /PARAMETERS Qualifier

DIGITAL TCP/IP Services for OpenVMS supports numerous options for the DCL PRINT /PARAMETERS=(option=value) command. For example, it supports the PAGE_SIZE option as follows:

```
$ PRINT/PARAMETERS=(PAGE_SIZE=size) /QUEUE=queue_name filename
```

When you enter the PRINT /PARAMETERS=(option=value) command, enclose the following in quotation marks:

- Blanks
- Non-alphanumeric characters, including spaces and slashes

You can use the following /PARAMETERS options for both local printing (standard DCL PRINT) and remote printing (DCL PRINT with LPR/LPD network services).

```text
<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DATA_TYPE</td>
<td></td>
</tr>
<tr>
<td>NUMBER_UP</td>
<td></td>
</tr>
<tr>
<td>PAGE_LIMIT</td>
<td></td>
</tr>
<tr>
<td>PAGE_ORIENTATION</td>
<td></td>
</tr>
<tr>
<td>PAGE_SIZE</td>
<td></td>
</tr>
<tr>
<td>SHEET_COUNT</td>
<td></td>
</tr>
<tr>
<td>SHEET_SIZE</td>
<td></td>
</tr>
<tr>
<td>SIDES</td>
<td></td>
</tr>
</tbody>
</table>
```

For a full description of the options supported for DCL local as well as remote printing, enter the following command.

```
$ HELP PRINT_PARAMETER
```

**Note**

This help is available only if the DECprint Supervisor (DCPS) software is installed on your system. See your system manager for more information.

The following /PARAMETERS options are supported only for use with remote printing.

```
HOST    MAIL
NOFLAG  PRINTER
```

The options are described in more detail in the following sections.

### 6.1.2.1 /PARAMETERS Qualifier: Host and Printer Options

Use the HOST and PRINTER options together to send a print job to any remote host and printer that does not have a specific print queue defined on the local system.

In conjunction with the HOST and PRINTER qualifiers, you must also specify the /QUEUE qualifier. The value of the /QUEUE must be a local LPD print queue established for remote printing. This may be a generic LPD queue set up to handle all remote printing requests or a specific LPD queue for a particular remote printer.
For example, the following command specifies that the file PINS.LIS be sent to printer CT_LN05R on remote host BALT using the generic remote printing queue DPR_ANSI.

```shell
$ PRINT/PARAMETERS=(HOST=BALT, PRINTER=CT_LN05R) /QUEUE=DPR_ANSI PINS.LIS
```

The HOST and PRINTER options allow you to use any available network printers, without your system manager having to set up additional LPD remote queues for each of these printers.

Specify the remote host name either by the host name or by its fully qualified domain name (see Section 1.4).

### 6.1.2.2 /PARAMETERS Qualifier: MAIL Option

The MAIL option causes the remote host to notify you through SMTP mail when the print job completes. The following command example specifies the MAIL option.

```shell
$ PRINT/PARAMETERS=MAIL /QUEUE=DPR_ANSI PINS.LIS
```

### 6.1.2.3 /PARAMETERS Qualifier: NOFLAG Option

The NOFLAG option suppresses printing of a banner (flag) page at an LPD queue. For information about LPD queues, see the DIGITAL TCP/IP Services for OpenVMS Management manual.

The following command example specifies the NOFLAG option.

```shell
$ PRINT/PARAMETERS=NOFLAG /QUEUE=DPR_ANSI PINS.LIS
```

### 6.1.3 Remote Queue Printing Examples

The following examples show how to use the remote queue print capabilities of DIGITAL TCP/IP Services for OpenVMS.

1. This example sends local file PINS.LIS to the remote print queue defined locally as FAC3_ANSI and requests notification through SMTP when the job completes at the remote printer.

```shell
$ PRINT /PARAMETERS=MAIL /QUEUE=FAC3_ANSI PINS.LIS
```

2. This example shows how to send a local file to the remote print queue defined locally as OUR_PS for printing at a remote printer. The command specifies that text be printed on both sides of each sheet. The file is ROUGH.TXT.

```shell
$ PRINT /QUEUE=OUR_PS /PARAMETER=(SIDES=2) ROUGH.TXT
```

3. This command sends a print job to the remote queue defined locally as YOUR_PS.

```shell
$ PRINT /QUEUE=YOUR_PS -
    $ /PARAMETERS=(DATA_TYPE=POST,PAGE_ORIENTATION=LANDSCAPE,SIDE=2) -
    $ LET.LIS
```

4. This example sends a print job to Internet host PACE.SATRN.COM to print on printer K1_PRINTER.

```shell
$ PRINT /QUEUE=LPD_OUTQ -
    $ /PARAMETERS=(HOST=PACE.SATRN.COM,PRINTER=K1_PRINTER) -
    $ USER$4:[GRANT.FINAN.SALES]ANNUAL.TXT
6.2 Displaying the Status of Jobs in a Remote Print Queue

To display the status of jobs you send to a remote printer, use the LPQ command. The following information is displayed:

- Your name
- Current rank of job in the queue
- Names of the files in job
- Job identifier
- Total size of job in bytes

The following examples show how you can use the LPQ command.

1. This example displays all entries in the LPS40_QUE queue.
   
   $ LPQ LPS40_QUE

2. This example shows information about Job 4 in the print queue named OFFICE_QUE.
   
   $ LPQ OFFICE_QUE /ENTRY=4

3. This example shows information about Jobs 1, 2, and 3 in print queue PEACE_Q.
   
   $ LPQ PEACE_Q /ENTRY=(1,2,3)

4. This example shows information about user NELSON's jobs in the print queue FRONT_Q.
   
   $ LPQ FRONT_Q /USER=NELSON

6.3 Removing Jobs from the Print Queue

To remove your jobs from a remote print queue, use the LPRM command. Using the LPRM command, you can remove the following:

- All of your active jobs
- All jobs, if you have the required privileges
- Selected jobs

The following examples show how you can use the LPRM command.

1. This example deletes one job from print queue BASE_Q.
   
   $ LPRM BASE_Q /ENTRY=7

2. This example deletes jobs 555, 556, and 558 from queue BASE_Q.
   
   $ LPRM BASE_Q /ENTRY=(555,556,558)

3. In this example, the system manager, who has the required privileges, deletes all jobs from queue MAIN_QUE.
   
   $ LPRM /ALL MAIN_QUE
6.4 Printing Remote UNIX Files on Local Queues

Your system manager can set up a local print queue to handle print jobs for files sent from a remote UNIX host. To print UNIX files on an OpenVMS printer, the UNIX user enters an `lpr` command. (See the appropriate UNIX documentation.)

Local queues set up to receive UNIX print jobs support layup definition files. These are files supported only by DIGITAL and used to set the following layup features: borders, sheet margins, alternating sheet margins, pages per sheet, first page, page order, and page grid.

The following example sends UNIX file `/usr/stanton/recent.cnts` to OpenVMS print queue `REMOTE_QUEUE4` and specifies the formatting defined in the layup file called `layup3`. The `REMOTE_QUEUE4` print queue is set up as a remote queue in the `printcap` file by the system manager.

```
% lpr -Llayup3 -Premote_queue4 /usr/stanton/recent.cnts
```

6.5 Obtaining Online Help

You can obtain online help for the LPR/LPD network printing services by entering the following commands:

```
$ HELP TCPIP_SERVICES LPR_LP
$ HELP LPQ
$ HELP LPRM
```

6.6 Command Descriptions

This section provides complete descriptions of the commands you can use to send a print job to a remote printer, monitor remote print jobs, and remove remote print jobs.
LPQ

Displays the status of your jobs in a remote print queue:
- Current rank of your job in the queue
- Names of your queued files
- Job identifier
- Size of jobs in bytes

Format

LPQ queue [ /ENTRY=n ]
[ /HOST=host ]
[ /PRINTER=remote_printer ]
[ /USER=user_name ]

Parameters

queue
Required.
Queue for which you want status.

Qualifiers

/ENTRY=n
Optional. Default: all jobs. You can specify a list of values.
Displays status for the specified jobs.

/HOST=host
Optional. Default: host defined in the printcap file.
Displays status for the jobs you sent to the specified host. This is the host you also specified in the PRINT /PARAMETERS=(HOST=host) command.

/PRINTER=remote_printer
Optional. Default: printer defined in the printcap file.
Displays status for the jobs you sent to the specified remote printer. This is the queue you also specified in the PRINT /PARAMETERS=(PRINTER=queue) command.

/USER=user
Optional. Default: all users.
Displays status for the jobs sent by the specified user. You can specify a list of values.

Examples

1. $ LPQ LPS40_QUE
   Shows all entries in the LPS40_QUE queue.
2. $ LPQ MAIN_QUE /ENTRY=4  
   Shows information about Job 4 in the print queue named MAIN_QUE.

3. $ LPQ PEACE_8 /ENTRY=(1,2,3)  
   Shows information about Jobs 1, 2, and 3 in print queue PEACE_8.

4. $ LPQ 3RD_FLOOR_Q /USER=MILLER  
   Shows information about user MILLER's jobs in the print queue called 3RD_FLOOR_Q.
LPRM

Removes one or more jobs from a remote print queue.

Format

LPRM queue { /ALL
/ENTRY=n
/USER=user_name }
[ /HOST=host ]
[ /PRINTER=remote_printer ]

Parameters

queue
Required.
Print queue with waiting jobs you want to delete.

Qualifiers

/ALL
Required, unless you specify /ENTRY or /USER.
Removes all jobs for all users from the specified queue. Requires SYSPRV, OPER, or BYPASS privileges. Comparable to the UNIX command lprm -Pqueue - when performed by the root user on the UNIX system.

/ENTRY=n
Required, unless you specify /ALL or /USER.
Removes the specified job. Specify only your own jobs. You can specify a list of values.

/USER=user
Required, unless you specify /ALL or /ENTRY.
Removes jobs by user name. You can specify a list of values.

/HOST=host
Optional. Default: host defined in the printcap file.
Removes jobs by host for the host you specified in the PRINT /PARAMETERS=(HOST=host) command.

/PRINTER=remote_printer
Optional. Default: printer defined in the printcap file.
Removes jobs from the remote printer you specified in the PRINT /PARAMETERS=(PRINTER=queue) command.

Examples

1. $ LPRM BASE_Q /ENTRY=7
   Deletes your Job 7 from print queue BASE_Q.
2. `LPRM FRONT_Q /ENTRY=(555,556,558)`

From queue FRONT_Q, deletes a list of entries: 555, 556, and 558.
Accessing User Information Using the Finger Utility

For displaying information about users on remote systems and your local system, the DIGITAL TCP/IP Services for OpenVMS product includes the Finger utility. For example, you can use the utility to determine which users are logged on to a system or to refresh your memory about the correct login name to use before using FTP or another service to connect to an account on a remote host.

The Finger listing may include such information as:

• User name
• Account name
• Program the user is running
• User’s home directory
• User’s plans, activities, and other information
• User’s project

What You Can Do

The following table lists the capabilities provided by Finger and the sections that explain how to use them.

<table>
<thead>
<tr>
<th>Capability</th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Display brief information about all users on a host</td>
<td>7.3.1</td>
</tr>
<tr>
<td>Display detailed information about one or more specific users on a host</td>
<td>7.3.2</td>
</tr>
<tr>
<td>Display information about all users logged in to OpenVMS Cluster system</td>
<td>7.3.3</td>
</tr>
<tr>
<td>Get information from a host that is not directly accessible to your local host</td>
<td>7.4</td>
</tr>
<tr>
<td>Make planning and project information about yourself available to other Finger users</td>
<td>7.5</td>
</tr>
</tbody>
</table>

What You Need

The Finger software must be enabled (see your system manager). If the Finger software is not enabled on your local OpenVMS host, when you attempt to display information about users on that host, an error message is returned. For example, the following error message indicates the Finger image was not installed with the privileges required. See your system manager.

%SYSTEM-S-NOTALLPRIV, not all requested privileges authorized

The Finger utility must be enabled on any remote host for which you want information. If the software does not exist or is disabled on the remote host, an error message is returned, such as the following:

FINGER-I-CONNREF, Connection refused
Accessing User Information Using the Finger Utility

7.1 Typing FINGER Commands

Use the following rules for command syntax, quotation marks, and wildcards when you enter FINGER command lines.

7.1.1 Quotation Marks

By default, the Finger utility translates all user and host name specifications to lowercase. If you specify any letters that must be uppercase, then you must enclose them in quotation marks. In the following example, the UNIX user name includes uppercase letters that need quotation marks around them:

FINGER "B"OB"M"ILLER@BASE1

7.1.2 Wildcards

Wildcards are not accepted for OpenVMS hosts, but may be valid for some UNIX hosts.

7.1.3 Qualifiers

Qualifiers to the FINGER command must follow immediately after the command, preceding the user and/or host name. If the qualifier follows the user and/or host name, the Finger utility interprets the qualifier as a user name. For example, in the following command the qualifier /FULL incorrectly appears after the user specification. As indicated by the last line in the display, the Finger server interprets "/FULL" as a user login name.

$ FINGER ROLLINS /FULL

Username Real Name Program Login Term/Location
ROLLINS Ben Rollins $ Mon 15:02 64606::ROLLINS

Login name: ROLLINS In real life: Professor Rollins
Account: RES9 Directory: WORK1$:ROLLINS
Last login: Tue 3-MAR-1998 09:05:29
Unread mail: 25
Project: Homeopathic medicine/Silica
No Plan.
Login name: /FULL In real life: ???

The following example shows the correct position of the qualifier (the information displayed now includes user ROLLINS’ real name and current program).

$ FINGER /FULL ROLLINS

[stlab1.bastyr.edu]

Username Real Name Program Login Term/Location
ROLLINS Ben Rollins $ Mon 15:02 64606::ROLLINS
ROLLINS $ Mon 09:42 64606::ROLLINS

Login name: ROLLINS In real life: Professor Rollins
Account: RES9 Directory: WORK1$:ROLLINS
Last login: Tue 3-MAR-1998 09:05:29
Unread mail: 25
Project: Homeopathic medicine/Silica
No Plan.
7.2 Obtaining Online Help

You can obtain online help for the Finger utility by entering either of the following commands:

$ HELP TCPIP_SERVICES FINGER
$ HELP FINGER

7.3 Displaying Information About Users

To display information about all users on a remote host, enter the FINGER command followed by the host name (FINGER @hostname). To display more detailed information about a particular user, specify the user name with the host name (format FINGER username@hostname). To display information about all users on your local host, enter the FINGER command without specifying a host name. To display detailed information about a specific user on your local host, enter the FINGER command followed by the user name. Table 7–1 summarizes the different ways to display user information.

Table 7–1 Ways of Displaying Information

<table>
<thead>
<tr>
<th>If you need ...</th>
<th>Use this command...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brief information about all users on a remote host</td>
<td>FINGER @hostname</td>
</tr>
<tr>
<td>Brief information about all users on your local host</td>
<td>FINGER</td>
</tr>
<tr>
<td>Brief information about all users on your cluster</td>
<td>FINGER/CLUSTER</td>
</tr>
<tr>
<td>Detailed information about a specific user on a remote host</td>
<td>FINGER username@hostname</td>
</tr>
<tr>
<td>Detailed information several users on a remote host</td>
<td>FINGER user1name@hostname user2name@hostname</td>
</tr>
<tr>
<td>Detailed information about a specific user on your local host</td>
<td>FINGER username</td>
</tr>
<tr>
<td>Detailed information about several users on your local host</td>
<td>FINGER user1name user2name</td>
</tr>
<tr>
<td>More detailed information about users on the local host, including their real name and all logins</td>
<td>FINGER/FULL</td>
</tr>
<tr>
<td>Detailed information about a specific local user and brief information about all local users</td>
<td>FINGER/ALL username</td>
</tr>
</tbody>
</table>
7.3 Displaying Information About Users

7.3.1 Displaying Information About All Users

To display brief information about all users on a host, use the FINGER command with the host name only, in the format @hostname. If you use the FINGER command alone (without specifying a host name), you receive brief information about all users on your local system. The following example shows how to display brief information about all users on remote host SCIENCE:

```
$ FINGER @SCIENCE
[science.ucd.edu]
Username Program Login Term/Location
BRADY $ Thu 07:50 dialin_706_101.ucd.lab.edu
CORRIT $ Tue 13:30 64334::CORRIT
DAVE MAIL Mon 15:02 64334::DAVE
DAWSON $ Thu 14:57
FLOYD $ Mon 17:00
KITT TPU Mon 16:57 62555::KITT
MIRTH $ Wed 16:04 UCDVAX::MIRTH
NATALIE $ Tue 09:23 64222::NATALIE
RAPSONG $ Mon 18:50 64442::RAPSONG
```

7.3.2 Displaying Detailed Information About Specific Users

To display details about one or more users on a remote host, specify the user name or a list of user names, including the host name with each user name, as shown in the examples that follow. To display more information about users on your local host, specify the user name(s) without a host name. The information about each user includes the following items in addition to the user (login) name, program, login time, and terminal/location that is returned in the default, brief display:

- Login name
- Full name (real name)
- Working directory
- Last (previous) login
- Number of unread mail messages
- Plans and project, if the user has made the information available

The following examples show how to display information about specific users.

1. This example shows how to receive detailed information about user HOWE on host BEARINGS. The second line of information indicates user HOWE is logged on and using the Mail utility.

```
$ FINGER HOWE@BEARINGS
[bearings.us.beacorp.com]
Username Program Login Term/Location
HOWE MAIL Mon 15:02 84640::HOWE
Login name: HOWE In real life: Abe Howe
Account: INVENT Directory: DISK$1::HOWE
Last login: Tue 3-MAR-1998 10:15:39
No unread mail
Project: Inventory
No Plan.
```
7.3 Displaying Information About Users

2. To display information about several specific users on a remote host, specify each username@hostname separated by a space. This example shows how to display detailed information about users HOWE and JESSE on host BEARINGS, and user billings on UNIX host class. Note that user HOWE is not currently logged on to host BEARINGS. JESSE is logged on, so FINGER includes a line of information for JESSE including the program JESSE is using (DCL at present) and the time of login.

```
$ FINGER HOWE@BEARINGS JESSE@BEARINGS BILLINGS@CLASS
```

```
[bearings.us.beacorp.com]
Login name: HOWE In real life: Abe Howe
Account: INVENT Directory: DISK$1:[HOWE]
Last login: Tue 3-MAR-1998 10:15:39
No unread mail
Project: Inventory
No Plan.
[bearings.us.beacorp.com]
Username Program Login Term/Location
HOWE $ Thu 09:24
[bearings.us.beacorp.com]
Username Program Login Term/Location
JESSE $ Thu 09:24
Login name: JESSE In real life: JESSE BOYD
Account: PLAN3 Directory: DISK$1:[JESSE]
Last login: Mon 2-MAR-1998 16:48:50
Unread mail: 1
Project: Planning
Plan:
Next phase: December
Email: jesse@bearings.us.beacorp.com
Phone: 526-5444
```

```
[bearings.us.beacorp.com]
Login name: billings (messages off) In real life: M. T. Billings
Office: BLDG2-2, 236-8936 Home phone: 508-466-7873
Directory: /usr/users/billings Shell: /usr/bin/csh
On since Jan 17 14:33:06
   on :0
On since Jan 17 14:33:13 15 days Idle Time
   on tty1
On since Jan 17 14:33:13 2 days 23 hours Idle Time
   on tty2
On since Feb 4 13:13:50 2 days 23 hours Idle Time
   on tty5
No Plan.
```

3. To display detailed information about one or more specific users and brief information about all other users logged onto a remote host, specify the user@host format for the specific users plus @host for the brief listing of all users, as in this example.

```
$ FINGER DALB@BEARINGS @BEARINGS
```

```
Username Program Login Term/Location
```

```
Login name: DALB In real life: Bob Dalb
Account: ENG_3 Directory: WORK1$:[DALB]
Last login: Thu 5-MAR-1998 16:26:06
No unread mail
Project: TCP/IP Services for OpenVMS
No Plan.
```

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Accessing User Information Using the Finger Utility

7.3 Displaying Information About Users

4. To specify detailed information about specific users and brief information about the remaining logged-in users on a local host, use the the /ALL qualifier as in this example, which displays specific information about user HOWE at the local host plus brief information about all other users logged in. The output of this command is similar to that shown in the preceding example.

$ FINGER/ALL HOWE

7.3.3 Displaying Information About Users on Your Cluster

To display information about users on all nodes in your local OpenVMS Cluster, use the /CLUSTER qualifier, as in the following examples.

1. This example shows the default display for the FINGER/CLUSTER command.

$ FINGER/CLUSTER
2. You can display each user's real name and every login to cluster members by including the /FULL qualifier, as in this example.

$ FINGER/CLUSTER/FULL

<table>
<thead>
<tr>
<th>Username</th>
<th>Real Name</th>
<th>Node</th>
<th>Program</th>
<th>Login</th>
<th>Term/Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANND</td>
<td>Ann Darin</td>
<td>UCDAXP</td>
<td>$</td>
<td>Mon 17:00</td>
<td></td>
</tr>
<tr>
<td>BRADY</td>
<td>Robert Brady</td>
<td>UCDAXP</td>
<td>$</td>
<td>Thu 07:50 dialin_706_101.ucd.edu</td>
<td></td>
</tr>
<tr>
<td>CALLING</td>
<td>Alvin Calling</td>
<td>UCDWON</td>
<td>$</td>
<td>Fri 08:31</td>
<td></td>
</tr>
<tr>
<td>CURREN</td>
<td>Steve Curren</td>
<td>UCDAXP</td>
<td>$</td>
<td>Tue 13:30 84051::CURREN</td>
<td></td>
</tr>
<tr>
<td>DOBB</td>
<td>Barry Dobb</td>
<td>UCDWON</td>
<td>TCP/IP$FINGER</td>
<td>Mon 11:50</td>
<td></td>
</tr>
<tr>
<td>GILBERT</td>
<td>Joanne Gilbert</td>
<td>UCDVAX</td>
<td>MAIL</td>
<td>Thu 14:34 pccgil.admin.ucd.edu</td>
<td></td>
</tr>
<tr>
<td>IMMIN</td>
<td>Armen Immin</td>
<td>UCDALP</td>
<td>$</td>
<td>Wed 16:21 BIXBY::IMMIN</td>
<td></td>
</tr>
<tr>
<td>KITT</td>
<td>Evelyn Kitt</td>
<td>UCXAXP</td>
<td>$</td>
<td>Mon 16:57 62555::KITT</td>
<td></td>
</tr>
<tr>
<td>KITTEL</td>
<td>Herb Kittel</td>
<td>UCALP</td>
<td>$</td>
<td>Thu 14:12 AGGIE::KITTEL</td>
<td></td>
</tr>
<tr>
<td>LEVINE</td>
<td>Larry Levine</td>
<td>UCDUNI</td>
<td>DECWSSESSION</td>
<td>Thu 10:50</td>
<td></td>
</tr>
<tr>
<td>MILLER</td>
<td>Paul Miller</td>
<td>UCDALP</td>
<td>TCP/IP$FINGER</td>
<td>Thu 15:00 AGGIE::MILLER</td>
<td></td>
</tr>
<tr>
<td>MIRTH</td>
<td>Phil Anson</td>
<td>UCDVAX</td>
<td>$</td>
<td>Tue 17:09</td>
<td></td>
</tr>
<tr>
<td>NATAFLE</td>
<td>Natalie Beardsley</td>
<td>UCDAXP</td>
<td>$</td>
<td>Mon 09:23 64222::NATALIE</td>
<td></td>
</tr>
<tr>
<td>POFF</td>
<td>Pamela Offred</td>
<td>UCXAXP</td>
<td>$</td>
<td>Tue 02:42 AGGIE::POFF</td>
<td></td>
</tr>
<tr>
<td>RAPSONG</td>
<td>Aaron Feller</td>
<td>UCDAXP</td>
<td>$</td>
<td>Mon 18:50 64442::RAPSONG</td>
<td></td>
</tr>
<tr>
<td>TIBBS</td>
<td>Eugene Tibbs</td>
<td>AGGIE</td>
<td>$</td>
<td>Tue 20:43 UCXAXP::TIBBS</td>
<td></td>
</tr>
</tbody>
</table>

7.4 Forwarding Information from Host to Host

If your host does not have a direct connection to a remote host, you can use a forwarding host to get the information about users on that remote host. Your local host must be able to connect directly to the forwarding host, and the forwarding host must be able to connect directly to the destination. Specify the destination host and the forwarding host in the following format: username@destination_host@forwarding_host. For example, system UNION.CTSTATEU.EDU is not directly reachable, but you can get information from it indirectly through a gateway named U-GW.PA.ABCORP.COM. You would enter the following command to get information about user JONES on host UNION.CTSTATEU.EDU:

$ FINGER JONES@UNION.CTSTATEU.EDU@U-GW.PA.ABCORP.COM

By default, the Finger server does not allow queries to be forwarded from one host to another. To enable forwarding on the Finger server, see your system manager.

7.5 Making Your Information Available to Other Users

You can use the Finger utility to display a user's project and plans. The project (a single line of text) indicates the user's current project, work assignment, or work group. The user's plans can include several lines of information, such as where the user will be throughout the week, what the user plans to accomplish during the week, or even such information as the user's Web site, E-mail address, and telephone number, as in the following example:
I will be in my office Monday through Wednesday working at the S.F. lab. On Thursday and Friday, I will be at UC Irvine for a conference. Web site http://bio.ucd.edu/peters/r_peters.html

If you want to make such information about yourself available to other users through the Finger utility, create the following files in your home directory and add the appropriate information:

- **.PLAN** A file that contains your plans, whereabouts, and other information you want to have displayed. The file can contain more than one line.
- **.PROJECT** A file that specifies your project and/or work group. The file can contain only one line.

### 7.6 Command Description

To use FINGER commands, enter them at the DCL prompt.

This section provides a complete description of the FINGER command, its parameters, and qualifiers.
FINGER

Displays information about users on a host. You can display:

• Brief listings of all users on a host
• Detailed listings about specific users
• Listing of users on a cluster

Specifying the FINGER command without a user or host specification displays information about users logged in on your local system.

Format

FINGER [/ALL | /CLUSTER | /FULL] [username]@[hostname]

Parameters

username
Optional. Required for detailed information about a user.

Specify the user login name. For information about a user on your local system, do not include the @hostname. For information about a user on a remote system, include the host name (username@hostname).

@hostname
Optional. Required for information about users on a remote system.

For information about a specific user on a remote host, include the user name with the host name (username@hostname). For information about all users on the remote host, specify the host name only (@hostname). Omit the host name to display information about users on your local host.

Qualifiers

/ALL
Optional. Use when specifying a local user name. The /ALL qualifier must follow immediately after the FINGER command.

Displays a brief listing of all users in addition to detailed information about any specified users. Use this qualifier primarily for displaying information about users on the local host. The /ALL qualifier is ignored by most remote Finger servers when you specify a remote host name in the command line. To display brief information about all users on a remote host in addition to detailed information about specific users, specify the user@hostname format for each user plus @hostname (to list brief information about all users). Separate each user@hostname and @hostname specification with a space.

/CLUSTER
Optional. The /CLUSTER qualifier must follow immediately after the FINGER command. Do not specify a remote host name with this qualifier.

Displays information about all users logged in to the local OpenVMS Cluster system.

/FULL
Optional. The /FULL qualifier must follow immediately after the FINGER command.
FINGER Command Reference

FINGER

Displays detailed information such as the user’s real name and all logins of the user (without /FULL, the display includes the last login only). Use this qualifier primarily for displaying information about users on the local host.

Examples

1. $ FINGER FRANKEL@KCRA

   Username Program Login Term/Location
   FRANKEL $ Mon 15:10 KCRA::FRANKEL

   Login name: frankel In real Life: Sam Frankel
   Account: CC_Y9M Directory: WORK1$:[FRANKEL]
   Last login: Mon 30-MAR-1998 13:10:22
   No unread mail
   No plan

   Displays detailed information about user FRANKEL at host KCRA.

2. $ FINGER @OXYGEN

   [oxygen.gp.org]
   Username Program Login Term/Location
   BARD $ Mon 17:00
   CASON LSEDIT Thu 14:57
   CORR $ Tue 13:30 24151::CORR
   DUDLEY $ Mon 15:02 24646::DUDLEY
   GRAND $ Thu 07:50 NITROGEN::GRAND
   KURT $ Mon 16:57 22556::KURT
   KYLIE MAIL Thu 14:12 ELEMENT::KYLIE
   MYRA $ Wed 16:04 BIGVAX::MYRA
   NASON $ Tue 09:23 24200::NASON
   PHILLIPS $ Tue 02:42 BIGALP::PHILLIPS
   RAWLINGS $ Mon 18:50 24042::RAWLINGS

   Displays brief information about users logged in to host OXYGEN.

3. $ FINGER/FULL

   Username Real Name Program Login Term/Location
   BAIRD Randall Baird $ Mon 17:00
   CARR Rich Carr LSEDIT Thu 14:57
   CORTEZ Julia Cortez $ Tue 13:30 23441::CORTEZ
   DANBOY Dan Keller $ Wed 16:12 ogrady.ucsb.edu
   GANDHI T.J. Gandhi TPU Mon 16:57 12556::GANDHI
   LIMO Michael Limorley MAIL Thu 14:12 TOPDAY::LIMO
   MENNING Mark Menning $ Wed 16:04 TOPDAY::MENNING
   NELSON Anne Nelson $ Tue 09:23 22200::NELSON
   ROBERTS Michael Roberts $ Mon 18:50 22042::ROBERTS

   Displays the real name and all logins for each user.
4. $ FINGER/CLUSTER

<table>
<thead>
<tr>
<th>Username</th>
<th>Node</th>
<th>Program</th>
<th>Login</th>
<th>Term/Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMITH</td>
<td>MOUNTB</td>
<td>TPU</td>
<td>Fri 09:47</td>
<td>MOUNTB::SMITH</td>
</tr>
<tr>
<td>JONES</td>
<td>MOUNTC</td>
<td>$</td>
<td>Tue 18:02</td>
<td></td>
</tr>
<tr>
<td>BROWN</td>
<td>MOUNTC</td>
<td>$</td>
<td>Mon 17:04</td>
<td></td>
</tr>
<tr>
<td>TAYLOR</td>
<td>MOUNTB</td>
<td>EDT</td>
<td>Thu 15:59</td>
<td></td>
</tr>
<tr>
<td>CROSBY</td>
<td>MOUNTB</td>
<td>RTPAD</td>
<td>Thu 14:59</td>
<td></td>
</tr>
<tr>
<td>CARPENTER</td>
<td>MOUNTB</td>
<td>$</td>
<td>Wed 17:23</td>
<td>MOUNTB::SYSTEM</td>
</tr>
<tr>
<td>BLACK</td>
<td>MOUNTC</td>
<td>$</td>
<td>Tue 10:42</td>
<td>MOUNTC::BLACK</td>
</tr>
</tbody>
</table>

Displays information about all users on all members of the cluster.
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