VMS

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VMS DECnet Test Sender/DECnet Test Receiver Utility Manual

### VMS DECnet Test Sender/DECnet Test Receiver Utility Manual

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This document provides information for VMS users who want to test network task-to-task operations.

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### Preface

This reference manual presents the commands that make up the DECnet Test Sender/DECnet Test Receiver (DTS/DTR) Utility.

#### **Intended Audience**

The VMS DECnet Test Sender/DECnet Test Receiver Utility Manual is intended as a reference to the formats and syntax of the DTS commands for those already familiar with DECnet-VAX. System managers can use DTS to run connection, disconnection, data, and interrupt tests to check the software involved in task-to-task communication over the network.

#### **Document Structure**

This document consists of the following three sections:

- Description—Provides a full description of the DTS/DTR Utility, including the following topics:
  - -Operational characteristics -Command syntax
- Usage Summary—Outlines the following DTS/DTR information:
  - -Invoking the utility
  - -Exiting from the utility
  - -Printing test results
- Commands—Describes DTS commands, including format, parameters, qualifiers, and examples.

#### **Associated Documents**

Before using the DTS/DTR Utility, you should be familiar with the networking concepts presented in the VMS Networking Manual.

For information concerning VAX PSI, refer to the following manuals, which make up the VAX PSI documentation set:

- VAX P.S.I. Introduction
- VAX P.S.I. Installation Procedures
- VAX P.S.I. X.25 Programmer's Guide
- VAX P.S.I. X.29 Programmer's Guide
- VAX P.S.I. Management Guide
- VAX P.S.I. PAD and Mail Utilities Manual
- VAX P.S.I. Problem Solving Guide
- Public Network Information

The following functional specifications define DIGITAL Network Architecture (DNA) protocols to which all implementations of DECnet adhere:

- DECnet DIGITAL Network Architecture General Description
- DIGITAL Data Communications Message Protocol Functional Specification
- Network Services Protocol Functional Specification
- Maintenance Operation Protocol Functional Specification
- Data Access Protocol Functional Specification
- Routing Layer Functional Specification
- DNA Session Control Functional Specification
- DNA Phase IV Network Management Functional Specification
- Ethernet Node Product Architecture Specification
- Ethernet Data Link Functional Specification

#### Conventions

Convention	Meaning
RET	In examples, a key name (usually abbreviated) shown within a box indicates that you press a key on the keyboard; in text, a key name is not enclosed in a box. In this example, the key is the RETURN key. (Note that the RETURN key is not usually shown in syntax statements or in all examples; however, assume that you must press the RETURN key after entering a command or responding to a prompt.)
CTRL/C	A key combination, shown in uppercase with a slash separating two key names, indicates that you hold down the first key while you press the second key. For example, the key combination CTRL/C indicates that you hold down the key labeled CTRL while you press the key labeled C. In examples, a key combination is enclosed in a box.
\$ SHOW TIME 05-JUN-1988 11:55:22	In examples, system output (what the system displays) is shown in black. User input (what you enter) is shown in red.
\$ TYPE MYFILE.DAT	In examples, a vertical series of periods, or ellipsis, means either that not all the data that the system would display in response to a command is shown or that not all the data a user would enter is shown.

Convention	Meaning In examples, a horizontal ellipsis indicates that additional parameters, values, or other information can be entered, that preceding items can be repeated one or more times, or that optional arguments in a statement have been omitted.		
input-file,			
[logical-name]	Brackets indicate that the enclosed item is optional. (Brackets are not, however, optiona in the syntax of a directory name in a file specification or in the syntax of a substring specification in an assignment statement.)		
quotation marks apostrophes	The term quotation marks is used to refer to double quotation marks ("). The term apostrophe (') is used to refer to a single quotation mark.		

# New and Changed Features

This version of the VMS DECnet Test Sender/DECnet Test Receiver Utility Manual contains no new technical information.

### **DTS/DTR** Description

This section describes the operational characteristics of the DECnet Test Sender/DECnet Test Receiver (DTS/DTR) Utility and the command syntax for DTS.

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#### **Operational Characteristics**

DTS and DTR are cooperating tasks that perform various functions to exercise network software. DTR functions as a slave to DTS. DTS initiates each test by issuing a connection request to DTR. DTS passes parameters pertinent to the type of test request to DTR in the optional data of the connection request. The user interface to DTS consists of a group of commands. These commands enable you to select the type of test and subtest and to specify options relative to the operation of the test. These options include parameters to regulate the duration of the test, the type of information to be used for the test, and buffer-level control.

The DTS command syntax allows for two types of buffer-level option: SQUEUE and RQUEUE. SQUEUE affects the operation of DTS, whereas RQUEUE affects the operation of DTR. The SQUEUE parameter specifies the transmission buffer level for DTS. This level is the number of transmission requests that DTS attempts to keep outstanding to the network during the data test. For an echo test, the SQUEUE parameter also specifies the DTS buffer level for receiving data. The RQUEUE parameter specifies the DTR buffer level for receiving data during the data test.

Note that the VMS DECnet Test Receiver (DTRECV) image cannot perform multiple buffering. In addition, it does not support any negative acknowledgment (NAK) or BACK options nor flow control other than segment. The VMS DECnet Test Sender (DTSEND) image does not support multiple buffering either.

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#### **DTS Command Syntax**

This section describes the DTS command syntax for all tests. Each command consists of a command keyword, optional general command qualifiers, each preceded by a slash (/) character, and optional command-specific qualifiers, each preceded by a slash character. You may abbreviate command keywords and qualifiers to four characters or less (if unique).

Note that, when using DTS commands in a batch job, you must use uppercase characters in the command.

### **DTS/DTR Description**

The general DTS command syntax and the definition of each command component is as follows.

command-keyword/general-qualifier,.../command-specific-qualifier,...

command-keyword	Specifies the general test to be performed.CONNECTIndicates a connect test		
	DISCONNECT	Indicates a disconnect test	
	DATA	Indicates a data test	
	INTERRUPT	Indicates an interrupt test	
general-qualifier	Specifies one or more general test characteristics regardless of the test to be performed. These qualifiers and their default values are described in each command (CONNECT, DATA, DISCONNECT, and INTERRUPT) where they apply.		
command-specific-qualifier	•	or more test-specific qualifiers e operation of the test.	

The general command syntax adheres to the DCL rules for comments and continuation lines, as shown in the following example:

\$ RUN SY	S\$SYSTEM:DTSEND			
_TEST:	DATA/PRINT/TYPE=SEQ	!Perform	Data Test	
•				
•				
_TEST:	INTERRUPT/NODENAME=DALLAS -			
	_/PRINT/TYPE=PAT		Interrupt	Test
			_	
•				
TEST:	EXIT			
\$	EXII			
•				

# **DTS/DTR Usage Summary**

DECnet Test Sender (DTS) and DECnet Test Receiver (DTR) are the DECnet transmitter and receiver test programs that exercise network task-to-task capabilities. DTSEND and DTRECV are the DECnet-VAX implementations of these programs. The images and command files to use DTSEND and DTRECV are included with the DECnet-VAX software.

There are four basic network tests provided by DTS and DTR:

- Connection tests
- Data tests
- Disconnection tests
- Interrupt tests

Each test is composed of a set of subtests. See the following sections for a description of each test and its subtests.

#### FORMAT \$ RUN SYS\$SYSTEM:DTSEND

COMMAND PARAMETERS	None.
usage summary	Before invoking DTS, be sure that the necessary line (if any) is in the ON state. To invoke DTS, type RUN SYS\$SYSTEM:DTSEND in response to the DCL prompt.
	DTS returns with the following information and prompt:
	DTS Version xxx initiated on dd-mmm-yy hh:mm:ss _Test:
	DTS accepts input entered interactively at the terminal. DTS also accepts a command procedure as input.
	To exit DTS and thereby terminate the test, enter EXIT at the <i>Test:</i> prompt. For example:
	_Test: EXIT
	DTS terminated on dd-mmm-yy hh:mm:ss \$
	Use the /PRINT qualifier to print test results. Also, you can use the /STATISTICS and /DISPLAY qualifiers to print statistics and messages transmitted to DTR, respectively. The /STATISTICS and /DISPLAY qualifiers apply only to the data and interrupt tests. See the individual commands for more information.

,

	This section explains how to use the four DTS tests. Examples are provided for each test.
COMMANDS	

#### **DTS Commands**

CONNECT DATA DISCONNECT INTERRUPT

#### CONNECT Invokes a connection test. FORMAT CONNECT [/general-qualifier[,...] /command-specific-qualifier[,...]] **GENERAL** /NODENAME=node-id Identifies the node (by name or address) on which DTR is to run. The default QUALIFIERS is the local node. Because you cannot use access control information as part of the node name, DTR runs on the default nonprivileged account on the remote node. /PRINT /NOPRINT Instructs DTS to print (or log) test results. The default is /NOPRINT. /SPEED=number Indicates the line speed (bits per second) of the test line. DTS uses this qualifier for reporting statistics. (DECnet does not control line speeds.) The default is /SPEED=1000000. Once selected, these qualifiers remain active until you explicitly change them or exit DTS. **COMMAND-**/TYPE=test-type Indicates the subtest for the connection test. There are two subtests: SPECIFIC QUALIFIERS ACCEPT Indicates a connect accept test. The default is /TYPE=ACCEPT. REJECT Indicates a connect reject test. /RETURN=return-option /NORETURN Indicates the type of optional user data DTR returns. The default is /NORETURN where DTR returns no optional user data. There are two possibilities:

STANDARD	Indicates standard user data.
RECEIVED	Indicates received user data.

### DESCRIPTION

Connection tests evaluate the ability of the network software to process connect, connect accept, and connect reject requests with and without optional user data. Connection tests that you may perform include the following:

- Connect reject without user data
- Connect accept without user data
- Connect reject with 16 bytes of standard user data
- Connect accept with 16 bytes of standard user data
- Connect reject with received user data used as reject user data
- Connect accept with received user data used as accept user data

#### **EXAMPLES**

**1** \_Test: CONNECT/TYPE=ACCEPT/RETURN=RECEIVED

This command invokes the connection test with the connect accept subtest. DTS attempts to connect to DTR on the local node (by default). Connect user data is to be returned as part of the test.

**2** \_Test: CONNECT/NODENAME=TRNTO

This command invokes the connection test with the connect accept subtest. DTS attempts to connect to DTR on remote node TRNTO. DTR returns no optional user data.

#### DATA Invokes a data test. FORMAT DATA [/general-qualifier[,...] /command-specific-qualifier[,...]] GENERAL /NODENAME=node-id Identifies the node (by name or address) on which DTR is to run. The default QUALIFIERS is the local node. Because you cannot use access control information as part of the node name, DTR runs on the default nonprivileged account on the remote node. /PRINT /NOPRINT Instructs DTS to print (or log) test results. The default is /NOPRINT. /STATISTICS /NOSTATISTICS Instructs DTS to print statistics on data and interrupt tests. The default is /STATISTICS. /DISPLAY=number /NODISPLAY Instructs DTS to print the specified number of bytes (in hexadecimal) of data and interrupt messages transmitted to DTR. The default is /NODISPLAY. /SPEED=number Indicates the line speed (bits per second) of the test line. DTS uses this qualifier for reporting statistics. (DECnet does not control line speeds.) The default is /SPEED=1000000. Once selected, these qualifiers remain active until you explicitly change them or exit DTS. COMMAND-/TYPE=test-type Indicates the subtest for the data test. There are four subtests: SPECIFIC QUALIFIERS SINK Indicates a sink test. The default is /TYPE=SINK. SEQ Indicates a sequence test. PAT Indicates a pattern test. ECHO Indicates an echo test.

#### /SIZE=number

Indicates the data message length in bytes. The lower bounds are 0 for a sink or echo test; 4 for a sequence test; and 5 for a pattern test. The upper bound is 4096 bytes for all tests. The default is /SIZE=128.

#### /[test-duration]

Indicates the duration of the test. There are three units of time for this parameter:

/SECONDS=number /MINUTES=number /HOURS=number

The number specifies the duration of the test. The default unit is /SECONDS=30. The maximum test duration is 3,600,000 seconds or 1000 hours.

#### /FLOW=flow-control

#### /NOFLOW

Indicates the flow control type—that is, the DTR buffering level. There are two types:

SEGMENT Indicates segment flow control.

MESSAGE Indicates message flow control.

With /NOFLOW, DTR uses no flow control. The default is /FLOW=MESSAGE.

#### /RQUEUE=number

Indicates the number of pending receives for DTR to maintain. The maximum number is 8. The default is /RQUEUE=1.

#### /SQUEUE=number

Indicates the number of pending transmissions for DTS to maintain. The default is /SQUEUE=1.

#### /NAK=number

#### /NONAK

Indicates the number of segments between NAKs. The default is /NONAK.

#### /BACK=number

#### /NOBACK

Indicates the number of segments before back pressuring. The default is /NOBACK.

DESCRIPTION Data tests provide a full spectrum of test capabilities, ranging from data sink operations to data integrity checking. Data tests that you may perform include the following: . Sink Test. DTR ignores all data received during this test. DTR performs neither sequence nor content validation. Sequence Test. Data messages transmitted by DTS to DTR include a 4-byte sequence number. During the sequence test, if a message is received out of sequence, DTR aborts the logical link and the test. Pattern Test. Data messages transmitted to DTR have both a sequence number and a standard data pattern. During the pattern test, if either the sequence number or the received data does not match the expected data, DTR aborts the logical link and the test. Echo Test. DTR transmits all data messages received back to DTS during this test. Neither DTS nor DTR performs sequence or data validity checking.

#### EXAMPLE

```
_Test: DATA/PRINT/TYPE=SEQ/SIZE=128/SECONDS=10/FLOW=MESSAGE
```

\_DTS-S-NORMAL, normal successful completion

```
Test parameters:
Test duration (sec) 10
Target nodename ""
Line speed (baud) 1000000
Message size (bytes) 128
Summary statistics:
Total messages XMIT 788 RECV 0
Total bytes XMIT 100864
Messages per second 78.8
Bytes per second 78.8
Bytes per second 10086
Line throughput (baud) 80691
_ Line utilization 8.0
```

This command invokes the data test with the sequence subtest. DTS sends messages to DTR on the local node where test information is to be printed. The message size is 128 bytes, and the duration of the test is 10 seconds. DTR uses message flow control.

# DISCONNECT

Invokes a disconnection test.

FORMAT	DISCONNECT	[/general-qualifier[,]
		/command-specific-qualifier[,]]

GENERAL QUALIFIERS

#### /NODENAME=node-id

Identifies the node (by name or address) on which DTR is to run. The default is the local node. Because you cannot use access control information as part of the node name, DTR runs on the default nonprivileged account on the remote node.

#### /PRINT

#### /NOPRINT

Instructs DTS to print (or log) test results. The default is /NOPRINT.

#### /SPEED=number

Indicates the line speed (bits per second) of the test line. DTS uses this qualifier for reporting statistics. (DECnet does not control line speeds.) The default is /SPEED=1000000.

Once selected, these qualifiers remain active until you explicitly change them or exit DTS.

#### COMMAND-SPECIFIC QUALIFIERS

#### /TYPE=test-type

Indicates the subtest for the disconnection test. There are two subtests:

SYNCHRONOUS	Indicates a synchronous disconnect	t test.
ABORT	Indicates a disconnect abort test. /TYPE=ABORT.	The default is

#### /RETURN=return-option

#### /NORETURN

Indicates the type of optional user data DTR returns. There are two possibilities:

STANDARD Indicates standard user data.

RECEIVED Indicates received user data.

The default is /NORETURN where DTR returns no optional user data.

### DTS DISCONNECT

DESCRIPTION

Disconnection tests evaluate whether DTS detects the difference between disconnection and abort sequences generated by DTR as well as the ability of DTS to receive the proper optional user data. Disconnection tests that you can perform include the following:

- Disconnect without user data
- Abort without user data
- Disconnect with 16 bytes of standard user data
- Abort with 16 bytes of standard user data
- Disconnect with received connect user data used as disconnect user data
- Abort with received connect user data used as abort user data

#### **EXAMPLE**

\_Test: DISCONNECT/NODENAME=DENVER/TYPE=ABORT

This command invokes the disconnection test with the disconnect abort subtest. DTS performs this test with DTR on remote node DENVER. No optional user data is to be returned.

PT		
Invokes an interrupt test.		
INTERRUPT [/general-qualifier[,] /command-specific-qualifier[,]]		
<b>/NODENAME=node-id</b> Identifies the node (by name or address) on which DTR is to run. The defaul is the local node. Because you cannot use access control information as part of the node name, DTR runs on the default nonprivileged account on the remote node.		
/PRINT		
<b>/NOPRINT</b> Instructs DTS to print (or log) test results. The default is /NOPRINT.		
/STATISTICS		
<b>/NOSTATISTICS</b> Instructs DTS to print statistics on data and interrupt tests. The default is /STATISTICS.		
/DISPLAY		
<b>/NODISPLAY</b> Instructs DTS to print the data and interrupt messages transmitted to DTR. The default is /NODISPLAY.		
<b>/SPEED=number</b> Indicates the line speed (bits per second) of the test line. DTS uses this qualifier for reporting statistics. (DECnet does not control line speeds.) The default is /SPEED=1000000.		
Once selected, these qualifiers remain active until you explicitly change them or exit DTS.		
/TYPE=test-typeIndicates the subtest for the interrupt test. There are four subtests:SINKIndicates a sink test. The default is /TYPE=SINK.SEQIndicates a sequence test.PATIndicates a pattern test.ECHOIndicates an echo test.		

#### /SIZE=number

Indicates the data message length in bytes. The lower bounds are 0 for a sink or echo test; 4 for a sequence test; and 5 for a pattern test. The upper bound is 16 bytes for all tests. The default is /SIZE=16.

#### /[test-duration]

Indicates the duration of the test. There are three units of time for this parameter:

/SECONDS=number /MINUTES=number /HOURS=number

The number specifies the duration of the test. The default unit is /SECONDS=30. The maximum test duration is 3,600,000 seconds or 1000 hours.

#### RQUEUE=number

Indicates the number of pending receives for DTR to maintain. The maximum number is 8. The default is /RQUEUE=1.

#### SQUEUE=number

Indicates the number of pending transmissions for DTS to maintain. The default is /SQUEUE=1.

DESCRIPTION

As with data tests, interrupt tests provide a full range of test capabilities from data sink operations to data integrity checking. Interrupt tests that you can perform include the following:

- Sink Test. DTR ignores all interrupt data received during this test. DTR performs neither sequence nor content validation.
- Sequence Test. Interrupt messages transmitted by DTS to DTR include a 4-byte sequence number. During the sequence test, if a message is received out of sequence, DTR aborts the logical link and the test.
- Pattern Test. Interrupt messages transmitted to DTR have both a sequence number and a standard data pattern. During the pattern test, if either the sequence number or the received data does not match the expected data, DTR aborts the logical link and the test.
- Echo Test. DTR transmits all interrupt messages received back to DTS during this test. Neither DTS nor DTR performs sequence or data validity checking.

### DTS INTERRUPT

#### **EXAMPLE**

```
_Test:
        INTERRUPT/NODENAME=DALLAS/PRINT/TYPE=PAT/SIZE=16
         _DTS-S-NORMAL, normal successful completion
         Test parameters:
         Test duration (sec) 30
         Target nodename "DALLAS"
         Line speed (baud) 1000000
          Message size (bytes) 16
         Summary statistics:
         Total messages XMIT 2734 RECV O
         Total bytes XMIT 43744
         Messages per second 91.1
         Bytes per second 1458
         Line throughput (baud) 11665
          __ Line utilization 1.1
                        This command invokes the interrupt test with the pattern subtest. DTS sends
                        interrupt messages to DTR on node DALLAS where test information is to be
                        printed. The interrupt message size is 16 bytes, and the duration of the test is
```

30 seconds (by default).

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