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## DECrouter 200

### Management Guide Volume II (Non-PTT)

AA-MK13A-TE

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# DECrouter 200

## Management Guide Volume II (Non-PTT)

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This guide explains how to maintain, monitor, manage, and test the DECrouter 200 routing server. This guide is divided into two volumes. Topics in Volume II include using the DECrouter 200 Configuration Program (DRCP) and customizing the permanent database of the DECrouter 200 system. This guide is for the DECrouter 200 manager.

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## Preface

This is Volume II of the *DECrouter 200 Management Guide* for the non-PTT software kit. The *DECrouter 200 Management Guide* tells you how to operate, maintain, monitor, test, and troubleshoot the DECrouter 200 Ethernet communications routing server. Volume II in particular shows you how to define and modify software parameters of the DECrouter 200 system.

The *DECrouter 200 Management Guide* follows a tutorial format, with some reference material, including complete descriptions for all the commands you can use to manage the system. One reference chapter discusses the commands of the DECrouter 200 Configuration Program (DRCP) and another explains Network Control Program (NCP) commands. This guide also presents explanations of the error messages generated by DRCP and event messages logged by NCP's Event Logger.

The *DECrouter 200 Management Guide* mainly addresses software management. Use it in conjunction with the *DECrouter 200 Hardware Installation/Owner's Guide*.

Another DECrouter 200 manual that you will find helpful is the *DECrouter 200 Software Installation Guide*. See this guide for operating-system-specific information about DECnet event logging, invoking the Network Control Program, starting the DECrouter Configuration Program (DRCP), starting the Router Configuration procedure, running the Remote Monitor, and running the Node List Builder utility.

The *DECrouter 200 Management Guide, Volumes I and II*, assumes that you are familiar with routing and networking concepts. These concepts are briefly discussed in this guide but are treated in depth in the *Routing and Networking Overview* manual.



## Intended Audience

This guide is for the **DECrouter 200 manager**, the person responsible for initializing, maintaining, managing, and troubleshooting the DECrouter 200 system.

## Terminology

“Router” is used throughout this manual to mean the “DECrouter 200 hardware unit, its firmware, and its operating software.”

## Structure of This Manual

The *DECrouter 200 Management Guide* is divided into two volumes. Volume I covers all management tasks except customizing the router’s software image on a load host. Volume II describes all the router’s permanent database parameters and tells you how to customize them for your network with the DRCP utility.

Volume I has 9 chapters and 4 appendixes. Volume II has 2 chapters and 2 appendixes. Some chapters are tutorial in nature, some solely for reference, and some a combination of both.

### Volume I

- Chapter 1      Introduces DECrouter 200 concepts and DECrouter 200 management tasks. This chapter describes the DECrouter 200’s environment and position in both a local area network and a wider network. It also summarizes the router’s possible hardware configurations.
- Chapter 2      Describes the router’s network components and introduces routing concepts.
- Chapter 3      Introduces the DECrouter 200 management tools.
- Chapter 4      Explains how to configure the load host’s router node database and DECnet databases.
- Chapter 5      Describes the different methods you can use to initiate a down-line load of the router software image from a load host to the DECrouter 200 unit. Command examples are provided.
- Chapter 6      Shows you how to use NCP to manage, monitor, and modify the operations of the running router. This chapter explains the use of NCP SHOW and SET commands, the router’s DECnet counters, and DECnet event logging.
- Chapter 7      Details the use of management tools for monitoring and testing router components, and for analyzing and troubleshooting problems. Non-technical DECrouter 200 managers can use this chapter.

- Chapter 8 Describes troubleshooting procedures. Nontechnical DECrouter 200 managers can use these procedures.
  - Chapter 9 Contains NCP command descriptions. This is a reference chapter.
  - Appendix A Summarizes the syntax of the NCP commands you use to manage the running router.
  - Appendix B Lists and describes the DECnet event messages generated by the router and messages about down-line loading that are generated by the router's load hosts.
  - Appendix C Gives instructions for setting up each type of supported modem.
  - Appendix D Summarizes some of the hardware configurations supported by the DECrouter 200 system.
- Volume II
- Chapter 1 Explains how to modify router parameters in the DECrouter 200 software image stored on the load host. This chapter fully explains DRCP and helps you customize your router's permanent database by defining each router parameter.
  - Chapter 2 Contains DRCP command descriptions. This is a reference chapter.
  - Appendix A Summarizes the syntax of all the DRCP commands.
  - Appendix B Lists the status, warning, and error messages generated by DRCP, along with descriptions of their meanings and appropriate corrective actions.

### **Using This Manual**

If you are familiar with managing Digital routers, either the DECrouter 200 system or other routers, you may first want to read Volume II Section 1.1, which discusses all the DECrouter 200 parameters, and then go on to Volume II, Chapter 2, for descriptions of the DRCP commands you use to set these parameters. Reference the other chapters as you need to.

If, on the other hand, you have not previously been a router manager, it is a good idea to read the chapters in this order:

1. Preface
2. Volume I Chapter 1
3. Volume I Chapter 2
4. Volume I Chapter 3
5. Volume I Chapter 4

6. Volume II Chapter 1
7. Volume I Chapter 5
8. Volume I Chapter 6
9. Volume I Chapter 7
10. Volume I Chapter 8

In particular, ensure that you understand the router's software parameters (see Volume II, Chapter 1). It is also especially important to understand down-line loading (see Volume I, Chapter 5) and the difference between changing values in the router's permanent database versus changing them in the operational database (see Volume I, Section 1.4.1).

### **Other DECrouter 200 Documents**

You may find this additional DECrouter 200 documentation helpful:

- *DECrouter 200 Hardware Installation/Owner's Guide*  
Explains how to install the DECrouter 200 hardware unit and how to verify its operation. Also discusses site preparation. The *DECrouter 200 Hardware Installation/Owner's Guide* is for the hardware installer and the router manager.
- *DECrouter 200 Identification Card*  
Provides the space to record the serial number, Ethernet address, DECnet node address, and DECnet node name of the router. This card is for the use of the network manager, the software installer, and the router manager.
- *DECrouter 200 Software Installation Guide (VMS)*  
Each software installation guide explains how to:
  - Install the DECrouter 200 distribution software onto a DECnet Phase IV system that you want to establish as a load host.
  - Configure that system's node database for routers.
  - Verify the load host installation and the DECrouter 200 installation.
  - Invoke NCP.
  - Start DRCP.

This guide is intended for the load host system manager and the server manager.

- *DECrouter 200 Technical Guide*

For second-level support (Digital field service personnel), this manual provides general operating instructions, detailed hardware logical functions, and diagnostic software information.

The manual is for training, field service, and manufacturing. The depth of technical information requires previous training or experience with Ethernet networks and with Digital VAX-11 architecture.

- *Routing and Networking Overview*

This manual is an introduction to routing in DECnet networks. It defines basic routing terminology and concepts. This manual also describes the types of computer systems that perform routing, explains how they carry out their routing functions, and provides guidelines for configuring networks for optimal routing performance.

This manual is intended for the network manager and other managers who participate in configuring and maintaining networks.

## **DECrouter 200 On-Line Documentation**

- *DECrouter 200 Release Notes*

Describes any discrepancies between the actual product and the information in the documentation set. These notes are intended for the software installer and the DECrouter 200 manager.

- DRCP On-Line Help

Provides reference information for all commands used to customize the router software image in the permanent database on the load host. DRCP Help is intended for the DECrouter 200 manager.

## **Associated Documents**

You should be familiar with the documentation set for each host system you use to manage the DECrouter 200, especially the host's DECnet documentation.

You also may need to refer to the manuals that describe the Ethernet hardware components to which the DECrouter 200 unit is connected, such as the H4000 or DECOM transceivers, and the Digital Equipment Local Network Interconnect (DELNI).

## **Conventions Used in This Manual**

To effectively use this manual, familiarize yourself with the general conventions and graphic conventions described in this preface:

- All numbers are decimal unless otherwise noted.
- All Ethernet addresses are given in hexadecimal.

## Graphic Conventions Used in This Manual

Convention	Meaning
Special type	Indicates a literal example of system output or user input. System output is in black type; user input is in red type.
lowercase/ UPPERCASE	In VMS command lines, UPPERCASE indicates keywords to be entered. Note that you can type the characters in either uppercase or lowercase. You can abbreviate command keywords to the smallest number of characters that DRCP or the host system accepts.

### NOTE

Many literal and nonliteral examples, file names, and utility names in running text assume that the host (management host, load host, logging host, etc.) is a DECnet-VAX node. If, in fact, your host system is a DECnet-ULTRIX node, type the commands and names in lowercase.

<b>bold</b>	<p>In nonliteral examples from DECnet-ULTRIX hosts and in running text about DECnet-ULTRIX hosts, indicates command names and options, file names, and utility names.</p> <p>In the command format within DRCP and NCP command descriptions, indicates the default.</p> <p>In running text in general, introduces new terms, which the text then defines.</p>
<i>italics</i>	Indicate a variable.
{ }	Indicates that you must specify the enclosed value or, if there are several enclosed values, at least one of those values. (Do not type the braces.)
[ ]	Indicates that the enclosed value or values are optional. (Do not type the brackets.)
...	Indicates that not all the display text or user input is shown.
.	
.	
.	

**key**

Indicates that you press the specified key.

**CTRL/x**

Indicates that you should hold the CONTROL key down and then press the key specified by *x*.

**RET**

Indicates the return key. Unless otherwise specified, you should end every command line by pressing **RET**. If you are using an IBM personal computer, note that this key is labeled differently on various models (refer to the documentation for your particular model to determine the correct key to use as a return key).



# 1

## Customizing the DECrouter 200 Software Image

This tutorial chapter explains how to customize the DECrouter 200 software image, a file with executable code and the router's permanent database parameters. To change parameter values in the permanent database, you issue DRCP SET and CLEAR commands. This procedure is known as **customizing the router's software image**.

To customize the router's software image, run the DECrouter 200 Configuration Program (DRCP). DRCP is the DECrouter 200 management utility you use to define, modify, and display permanent database parameters. This chapter fully describes the DECrouter 200 parameters and how you use DRCP. Specifically, this chapter:

- Defines the DECrouter 200 parameters and provides guidelines for selecting values
- Presents an overview of the DRCP commands
- Shows you how to invoke DRCP and open a software image file
- Discusses possible problems with opening software image files
- Tells how to use DRCP on-line help
- Shows how to display parameters
- Shows how to define and modify parameters
- Explains DRCP command files
- Shows how you can automatically create a command file or DRCP commands



- Shows how to reset all values to the defaults
- Shows how to ensure against lost parameter changes
- Shows how to restore lost changes
- Discusses how to repeat your DRCP session at the other load hosts

See Volume I, Section 3.2, for a discussion of the reasons for customizing the router's software image.

## 1.1 Specifying Values for DECrouter 200 Parameters

This section defines the DECrouter 200 operating parameters that make up the router's permanent and operational databases: circuit, executor, line, logging, and node parameters. The definitions include information to consider as you select values for these parameters. This section also summarizes the DRCP commands that you use to display and change these parameters in the permanent database.

Use this section for tutorial help. The parameters are explained in depth, with guidelines for choosing values. For related information, see:

- Volume I, Section 1.4.1, for the difference between using NCP commands to change parameters in the operational database of the running router and using DRCP commands to change parameters in the permanent database on the load host.

Some router parameters can be changed in both the operational and permanent databases, some in only the permanent database, and a few in only the operational database.

- Volume II, Chapter 2, for DRCP command descriptions with syntax information and examples of command lines.
- Volume I, Chapter 9, for NCP command descriptions with syntax information, examples of command lines, and the privilege level of each command.
- Volume II, Appendix A, for the syntax of DRCP commands.
- Volume I, Appendix A, for the syntax of NCP commands.
- The *Routing and Networking Overview*. This manual fully explains how to configure networks and customize the router's software image for optimal performance.

One of your tasks as router manager is evaluating routing and networking considerations when you define parameters.

Table 1-1 lists the router's parameters. For each parameter, the table shows its default and range of valid values.

**Table 1-1: DECrouter 200 Parameters and Values**

<b>Parameter</b>	<b>Default</b>	<b>Range</b>
<b>Executor Parameters</b>		
BROADCAST ROUTING TIMER	30	5-120 seconds
BUFFER SIZE	576	246-1482
LOGGING HOST	Load host	Any DECnet load host
MAXIMUM ADDRESS	1023	2-1023
MAXIMUM BROADCAST NONROUTERS	1022	0-1022
MAXIMUM BROADCAST ROUTERS	32	1-32
MAXIMUM COST	1022	2-1022
MAXIMUM HOPS	30	1-30
NONPRIVILEGED PASSWORD	None	1-39 alphanumeric characters
PATHSPLITS	1	1-4
PRIVILEGED PASSWORD	None	1-39 alphanumeric characters
<b>Circuit Parameters (Asynchronous Circuits)</b>		
COST	4	1-25
HELLO TIMER	30	3-8191 seconds
STATE	OFF	ON, OFF, MONITOR (for ASYNC-1) ON, OFF (for ASYNC-2 – ASYNC-8)
VERIFICATION	DISABLED	ENABLED, DISABLED, INBOUND
<b>Circuit Parameters (Ethernet Circuit)</b>		
COST	1	1-25
HELLO TIMER	30	3-8191 seconds
ROUTING PRIORITY	64	1-128
STATE	ON	ON, OFF

(Continued)

**Table 1-1 (Cont.): DECrouter 200 Parameters and Values**

<b>Parameter</b>	<b>Default</b>	<b>Range</b>
<b>Line Parameters (Asynchronous Lines)</b>		
CALL ATTEMPTS	3	1-25
CALL SETUP TIMER	60	1-300 seconds
CONNECTION TYPE	INCOMING	DIALBACK, INCOMING
LINE SPEED	9600 bps	300, 600, 1200, 2400, 4800, 9600, 19200
MODEM	DATA __LEADS __ONLY	CODEX, DATA __LEADS __ONLY, DF03, DF112, DF224, HAYES, YES
RECALL TIMER	3	1-60 minutes
<b>Line Parameter (Ethernet Line)</b>		
SERVICE PASSWORD	0 (no password checking)	0 to FFFFFFFFFFFFFFFF
<b>Event Logging Parameters</b>		
CONSOLE	Enabled	n/a
EVENT	KNOWN EVENTS	KNOWN EVENTS
FILE	Enabled	n/a
MONITOR	Enabled	n/a
<b>Node Parameters</b>		
DTEADDRESS	None	1-30 selected ASCII characters
INBOUND TYPE	None	ENDNODE, ROUTER
NAME	None	A valid DECnet node name
RECEIVE PASSWORD	None	1-8 alphanumeric characters
TRANSMIT PASSWORD	None	1-8 alphanumeric characters

Table 1-2 summarizes the DRCP commands that display and change permanent router characteristics.

**Table 1–2: DRCP Commands to Display and Change Permanent Parameters**

<b>Command</b>	<b>Function</b>
SET CIRCUIT	Modifies parameters as you specify
SET EXECUTOR	
SET LINE	
SET LOGGING	
SET NODE	
CLEAR EXECUTOR	Returns parameters to default values
CLEAR LINE	
CLEAR LOGGING	
CLEAR NODE	
SHOW CIRCUIT	Displays parameters
SHOW EXECUTOR	
SHOW LINE	
SHOW LOGGING	
SHOW NODE	

The following sections define the DECrouter 200 operating parameters.

### **1.1.1 Circuit Parameters**

To view the current permanent values for circuit parameters, use the **SHOW CIRCUIT *circuit-id*** or **SHOW KNOWN CIRCUITS** command. To change these values, issue the **SET CIRCUIT** command.

These are the router's circuit parameters, along with suggestions for setting values:

- COST

Specifies the routing cost of the circuit. The router uses the cost value to determine the routing path to a destination node, if more than one path exists. The router calculates the path cost for each path to the destination node and chooses the least costly path.

Changing the cost of one or more circuits controls routing paths. For example, if one circuit is heavily used, you can divert traffic to another circuit by increasing the cost of the heavily used circuit.

**Considerations:** The router is less likely to route messages along a high-cost circuit than a low-cost circuit. Therefore, give high-speed lines lower cost values and low-speed lines higher cost values. In this way, you force more messages along the high-speed lines and thus improve network traffic flow.

The default is 1 for the Ethernet circuit and 4 for the asynchronous circuits; the range of valid values is 1 to 25.

- HELLO TIMER

Specifies how often the router sends hello messages to the adjacent nodes on all circuits. If an adjacent node does not receive a hello message from the router within the specified time, it considers the router unreachable. The amount of elapsed time for this to happen is determined by the listen timer on the adjacent node.

When connected to a DECnet Phase III node, the router ignores the hello timer and automatically uses an appropriate value for that connection.

**Considerations:** Do not set too high a value. If the timer value is too large, the adjacent node waits a long time before it detects that the router is not reachable.

The default is 30 seconds; the range of valid values is 3 to 8191.

- ROUTING PRIORITY

Specifies the routing priority for the Ethernet circuit.

DECnet compares the routing priority values of all the nodes on the Ethernet, including all the DECrouter 200 nodes, and designates the router with the highest priority as the designated router. If two or more nodes on the Ethernet have the same highest routing priority value, the node with the highest node address is selected as the designated router.

**Considerations:** If two or more routers are on the same Ethernet, the designated router provides message routing services for the end nodes. If you specify a high priority for your DECrouter 200 system, it is more likely to be chosen as the designated router.

The designated router should be a reliable node, with resources free enough to perform routing responsibilities satisfactorily. If your router is likely to be rebooted often, or if its load is heavy, specify a low priority to lessen the probability that it will be selected as the designated router.

If any other router on the Ethernet is a DECnet Router/X.25 Gateway, it is better to give your DECrouter 200 system a higher priority and thus increase its workload, leaving the combined Router/Gateway free for other processing.

To learn which is the designated router, use the NCP SHOW ACTIVE CIRCUITS CHARACTERISTICS command (execute it locally at a node on the same Ethernet or remotely at the DECrouter 200 node when it is running). The Monitor utility also displays the designated router (see Volume I, Section 7.3).

The default is 64; the range of valid values is 0 to 127.

- STATE

Specifies the operational state of a DECrouter 200 circuit. This parameter controls network traffic because the state of a circuit affects the reachability of an adjacent node.

Change the state of a circuit to control the flow of data through the router and the network.

### CAUTION

Be sure to specify ON for at least one of the router's circuits (the default). If the circuits are all OFF, your router will be completely inaccessible after you initiate a down-line load and you will not be able to use the NCP SET CIRCUIT command to turn the circuits ON.

MONITOR applies only to asynchronous circuit ASYNC-1. MONITOR allows a terminal connected to circuit ASYNC-1 (port J1) to support the Monitor utility (see Volume I, Section 7.3).

**Considerations:** Turning off the appropriate circuits improves the router's performance over the remaining circuits.

The default for the asynchronous circuits is OFF. Traffic cannot flow over these circuits until you change the state to ON, which allows traffic over the circuit. This is the normal operational state allowing for complete route-through functions. OFF prevents traffic over the circuit. The circuit is unavailable for network activity.

The default for the Ethernet circuit is ON.

- VERIFICATION

Determines whether the router performs password checking during the routing verification message. Enabling VERIFICATION means that the router checks the receive password (defined with the SET NODE command) for a node that is requesting access.

If you specify ENABLED, the requesting node must supply a password that matches the receive password you defined for this node or the router rejects the connection request.

Setting VERIFICATION INBOUND means that during the routing verification message, the requesting node must send its receive password before the router sends its transmit password. Note that only one of the two nodes establishing a connection can have VERIFICATION set to INBOUND at one time.

The router applies the following rules when an adjacent node requests access:

- If you enable verification for a circuit, you must define a receive password for each node using that circuit.
- If you leave verification disabled for a circuit, it does not matter whether or not the nodes using that circuit have receive and transmit passwords. The router does no password checking and allows access to all requesting adjacent nodes.
- When the router performs password checking during routing verification, only if a node's receive password matches the transmit password sent by the node will the router allow access over the circuit.

**Considerations:** By default, access control verification is not in effect for communications over the router's asynchronous circuits. If you wish to enable access control verification for a circuit to prevent unauthorized access to the router, set VERIFICATION ENABLED and define receive and transmit passwords for the adjacent nodes connected by the circuit (see Section 1.1.5 on node parameters).

The default is DISABLED; the valid values are ENABLED, DISABLED, and INBOUND.

### 1.1.2 Executor Parameters

To view the current values for executor parameters, use the SHOW EXECUTOR command. To change these values, issue the SET EXECUTOR command. To clear the network privileged password or the network nonprivileged password, execute the CLEAR EXECUTOR PASSWORD command.

These are the router's executor parameters, along with suggestions for setting values:

- **BROADCAST ROUTING TIMER**

Determines the intervals at which routing messages are transmitted on Ethernet circuits. (This parameter affects only routing messages that do not involve configuration changes.)

When the broadcast routing timer expires, your router multicasts a routing message to all the other routers on the Ethernet.

The default is 30 seconds; the range of valid values is 5 to 120.

- **BUFFER SIZE**

Specifies the size for buffers used by the router for intermediate storage of user data being received and forwarded to adjacent nodes. The buffer size is used for all lines.

This parameter also sets the largest possible segment size of all messages received by the router. The segment size, minus a 24-byte DECnet header, is the largest block of message data that can be transmitted over a physical line.

This physical limitation does not restrict the size of user messages. If the message being transferred exceeds the segment size, DECnet divides the message into the necessary number of segments. The segments are transmitted to the destination node and there the message is reconstructed.

### **WARNING**

All nodes in the network should have the same buffer size.

**Considerations:** If the buffer size is smaller than that of another node using the router to forward messages, the router may not forward the entire message. You can set the buffer size to its maximum value without trading off system memory. By specifying the highest possible value, you ensure that the router can forward all messages sent to it.

The default is 576; the range of valid values is 246 to 1482.

- **LOGGING HOST**

Assigns a particular DECnet node to receive DECnet event messages generated by the router. The logging host is also known as the sink node. Any DECnet node can be the logging host.

**Considerations:** Event logging lets you monitor the router's activity on a continuing basis. By default, the last load host to load the router receives the router's event messages. Whenever the router is reloaded, however, the load host may change. Therefore, Digital suggests that you define one logging host for recording all event messages about the router's activity.



Check the following values:

- Check that the DECnet node address or DECnet node name you specify is valid. If you type an invalid address or name, for example, a DECnet node address that does not actually exist on the network, all future logging messages will be lost.
- Check that the DECnet node address of the logging host does not exceed the values for the router's MAXIMUM ADDRESS and MAXIMUM AREA or all future logging messages will be lost.
- Check that event logging is enabled on the node you specify (see Volume I, Section 5.4.1).

The default logging host is the last load host that performed a down-line load. The range of valid values is the node ID of any DECnet node.

- **MAXIMUM ADDRESS**

Specifies the router's highest reachable address. Use MAXIMUM ADDRESS to limit the size of the operational database.

#### **NOTE**

All nodes in the same area should have the same maximum address. For guidelines on selecting the maximum address, see the *Routing and Networking Overview* manual.

**Considerations:** Do not specify a value that is less than the load host's DECnet node address. If you do, immediately after a down-line load the router automatically resets MAXIMUM ADDRESS to the higher of these two numbers, making the database unnecessarily large.

If the address you specify is lower than the address of any actual nodes, those nodes are excluded from the operational routing database. The router will not send them routing update messages nor initialize communications with them.

Choose the lowest address that still exceeds the highest existing node address in the network. But choose a value sufficiently larger than the current network size to leave room for future expansion, depending on the anticipated growth rate of your network. Then, you will not have to change the parameter every time a node is added to the network.

Assigning an unnecessarily large value to the parameter, or keeping the default value, could result in larger routing update messages. This can waste bandwidth on the Ethernet and the asynchronous circuits. To ensure the smallest maximum address, the network manager should assign node numbers starting with 1 and incremented by 1.

Specify an integer in the range of 2 to 1023. The default is 1023.

- **MAXIMUM BROADCAST NONROUTERS**

Specifies the maximum number of Ethernet end nodes that the router's operational database can contain at one time. A **broadcast nonrouter** is an Ethernet end node.

Select a value that is large enough to include all the end nodes on the same Ethernet as the router. In multiple area networks, this applies to all end nodes in the same area and on the same Ethernet as the router.

If the network manager is likely to add new end nodes, specify a larger number than the actual number of current nonrouters so that each time a node is added, you will not have to modify this parameter in the permanent database and then reload the router.

**Considerations:** If you set a value that is lower than the actual number of Ethernet end nodes in the same area as your router, some nonrouting nodes may be unreachable. See Volume I, Section 8.2.1, for more details on problems that can arise.

When the number of active end nodes reaches the limit, the router rejects all additional end nodes requesting communication links. In this case, DECnet logs "Adjacency rejected" event message (4.14) (see Volume I, Section B.5).

Setting the value too high may introduce additional processing requirements on the router's routing function.

The default is 1022; the range of valid values is 0 to 1022.

- **MAXIMUM BROADCAST ROUTERS**

Specifies the maximum number of other Ethernet routing nodes that the router's operational database can contain at one time. A **broadcast router** is an Ethernet routing node.

This value applies to routing nodes within the same area on the same Ethernet as the router.

Select a value that is large enough to include all the other routing nodes. If the network manager is likely to add new routers, specify a larger number than the actual number of current routers so that each time a routing node is added, you will not have to modify this parameter in the permanent database and then reload the router.

**Considerations:** If the number you specify is less than the actual number of routers on the Ethernet, some routing nodes may be unreachable. This condition may cause parts of the network to become partitioned and unreachable. Do not specify a number that is less than the actual number of routers.

When the number of active routing nodes reaches the limit, the router drops from the routing database the routing nodes with the lowest routing priority (Section 1.1.1 discusses the routing priority circuit parameter).

A value that is too high may introduce additional processing requirements on the router's routing function. Configure as few routing nodes as possible to minimize routing overhead.

#### NOTE

Your Ethernet should contain as few routing nodes as possible.

Where possible, convert full-function routing nodes to end nodes, letting dedicated routers such as the DECrouter 200 system perform the routing. By using fewer routing nodes, you reduce system overhead and get better system performance. The trade-off is less configuration flexibility since nonrouting nodes can have only one physical link. However, they require less memory and are less expensive.

The default is 32; the range of valid values is 1 to 32.

- **MAXIMUM COST**

Specifies the maximum total path cost that the router allows for all hops from itself to another node. Use MAXIMUM COST to limit the amount of routing traffic when nodes become unreachable.

The router uses this value to determine whether a destination node is reachable. A node is unreachable if the cost to get to it exceeds the value of this parameter. Select a value large enough to include all the nodes you want to be reachable.

**Considerations:** The higher this value, the more information the nodes must exchange and the longer the network takes to reconfigure itself when a change occurs.

This parameter limits the size of the reachable network. If you set a high value, the router can reach more nodes but if the value is too high, the network has to exchange more information and takes longer to reconfigure itself when a topology change occurs.

If you have an extremely large network that includes distant nodes with which communications are unnecessary, use MAXIMUM COST to exclude these nodes from reach.

The default is 1022; the range of valid values is 2 to 1022.

- **MAXIMUM HOPS**

Specifies the maximum number of routing hops the router allows from itself to reachable nodes. Use MAXIMUM HOPS to limit the amount of routing traffic when nodes become unreachable.

The router uses this parameter to determine whether a destination node is reachable. A remote node is unreachable if the number of hops required to get to it exceeds the value set for this parameter. The value of `MAXIMUM HOPS` should always be equal to, or greater than, the longest possible path within the network.

**Considerations:** The higher this value, the more information the nodes must exchange and the longer the network takes to reconfigure itself when a change occurs. Set `MAXIMUM HOPS` to about 1 1/2 times the diameter (span) of the router's area.

This parameter limits the size of the reachable network. If you set a high value, the router can reach more nodes. If you have an extremely large network that includes distant nodes with which communications are unnecessary, use `MAXIMUM HOPS` to exclude these nodes from reach.

Setting this parameter too large causes excess network traffic. Packets circulating around the network as a result of a topology change will circulate longer before a router discards them. This situation uses more resources than necessary on routing nodes.

The default is 30; the range of valid values is 1 to 30.

- **NONPRIVILEGED PASSWORD**

Specifies a network management nonprivileged password.

This password provides router security and limits unnecessary processing. Defining this password prevents unauthorized users from issuing nonprivileged commands that display the router's operating parameters. The nonprivileged password makes issuing `NCP SHOW` commands that execute at the router a privileged operation.

**Considerations:** If you do not define this password, anyone can execute `NCP` nonprivileged commands that display the router's operational database. If you do define this password, users must specify either the nonprivileged or the privileged password to issue nonprivileged `NCP` commands that execute at the router.

Use the nonprivileged password in conjunction with the privileged password. If you want to protect nonprivileged operations, you most likely will want to protect privileged operations as well.

Default: none; the range of valid values is a string of from 1 to 39 alphanumeric characters.

- **PATHSPLITS**

Specifies the number of circuits over which the router performs path splitting.

The router performs path splitting when it can use several circuits to access a destination node. The router divides traffic bound for that destination evenly over the circuits. (Each of the paths to the destination node must have the same total path cost.)

If you want to enable path splitting over two to four of the circuits connected to the router, you must set this parameter, specifying the number of paths over which the splitting will occur.

**Considerations:** By using path splitting, you can configure several of the router's lines on several paths to a destination, each path having the same total path cost. Thus, you can attain high reliability for traffic sent to the destination.

Another benefit of path splitting is that you can connect several low-speed lines to a remote node, with the combined throughput being equivalent to what a single high-speed line would attain. This configuration may result in significant cost savings.

**NOTE**

Ensure that nodes that will receive data split over equal paths support out-of-order packet caching. Otherwise, they may receive packets out of order, which can cause communications problems.

The default is 1; the range of valid values is 1 to 4.

- **PRIVILEGED PASSWORD**

Specifies a network management privileged password.

This password provides router security and limits unnecessary processing. Defining this password prevents unauthorized users from issuing privileged commands that affect the router's operations and counters. The privileged password makes issuing privileged NCP commands that execute at the router a privileged operation.

**NOTE**

The previous software version allows only one network management password for the router. Command files you created from the previous software version may have this command: SET EXECUTOR PASSWORD. This command in a command file that you run to customize a V1.1 image automatically converts to SET EXECUTOR PRIVILEGED PASSWORD and sets the router's PRIVILEGED password.

**Considerations:** Digital highly recommends that you define a network management privileged password for your router. If you do not specify a password, any NCP user can change the router's operational database. If you do define this password, users must specify the privileged password to issue privileged NCP commands that execute at the router.

Default: none; the range of valid values is a string of from 1 to 39 alphanumeric characters.

### 1.1.3 Line Parameters

Use most of the parameters for the asynchronous lines to set up dial-back security for nodes. The router's dial-back feature can verify the identity of a node requesting a connection.

Whenever a remote node on a "dial-back" line sends a connection request to the router, the router breaks the connection and immediately phones the requesting node at the telephone number specified as the node's DTEADDRESS (see SET NODE). Only when the node answers, does the router allow access.

For the router to call back this node, you must also configure this line with a modem (MODEM parameter) that supports the dial-back feature. (The remote node can have any type of modem.)

The "dial-back" line parameters work in conjunction with one node parameter, DTEADDRESS. Specify a DTE address (phone number) for a remote node on the line.

The following parameters relate to dial-back security:

- CALL ATTEMPTS (Line parameter)
- CALL SETUP TIMER (Line parameter)
- CONNECTION TYPE (Line parameter)
- MODEM (Line parameter)
- RECALL TIMER (Line parameter)
- DTEADDRESS (Node parameter)

The CALL ATTEMPTS, CALL SETUP TIMER, and RECALL TIMER parameters are meaningful only if the line you are setting is a modem line to be used for dial-back security.

All the "dial-back" line parameters are related to each other. Note that you can set or modify them in any order with one exception. You must first set CONNECTION TYPE to DIALBACK and then set the MODEM parameter.

To view the current values for line parameters, use the `SHOW LINE line-id` or `SHOW KNOWN LINES` command. To change these values, issue the `SET LINE` command. To clear the DECnet service password, execute the `CLEAR LINE ETHER-1 SERVICE PASSWORD` command.

These are the router's line parameters, along with suggestions for setting values:

- **CALL ATTEMPTS**

Specifies the total number of times that the router tries to call a node on a dial-back line if the attempted connection is not successful.

**Considerations:** This parameter is meaningful only if the line you are setting is a modem line to be used for dial-back security.

The default is 3 tries; the range of valid values is 1 to 25.

- **CALL SETUP TIMER**

During a dial-back call, specifies the number of seconds that the router waits for an answer from a remote modem. When this value is exceeded, the router aborts its dial-back attempt.

The default is 60 seconds; the range of valid values is 1 to 300.

- **CONNECTION TYPE**

Indicates the type of connection that the line supports. The value `DIALBACK` specifies that the router should perform a dial-back security check when a remote node on the line requests access. If you are not setting up dial-back security for any nodes on this line, use the default `INCOMING`.

**Considerations:** You must set this parameter if the line is a modem line to be used for automatic dial-back.

If you specify `DIALBACK`, you must also specify a `DTEADDRESS` for at least one node calling on this line (see Section 1.1.5 on node parameters).

The default is `INCOMING` (hard-wired adjacent node or modem); the other valid value is `DIALBACK` (modem for dial-back is connected [see `MODEM` parameter]).

- **LINE SPEED**

Indicates the receive and transmit baud rate for the specified line.

**Considerations:** The setting for this parameter must be consistent with the setting for the connected device, either the adjacent node or a modem. If a modem is attached to the line, the setting for `LINE SPEED` must equal the modem's baud rate.

If this parameter is set wrong, the line will not work. If you or the network manager makes hardware changes that affect these parameters, use SET LINE to change the parameters and then reload the router.

The default for LINE SPEED is 9600 bps; the range of valid values is 300, 600, 1200, 2400, 4800, 9600, 19200.

- **MODEM**

If the CONNECTION TYPE is INCOMING, indicates whether the line is connected by a modem; if the CONNECTION TYPE is DIALBACK, indicates the type of modem.

By default, the router assumes that its asynchronous lines are hard-wired to the connected computer systems (DATA\_\_LEADS\_\_ONLY). If, instead, you are connecting a modem to the line, you must modify this parameter.

With a supported modem, you can use the router's dial-back security feature. To set up dial-back security for a node connected to this line, you must select one of these values:

---

<b>Value for MODEM</b>	<b>Use for This Modem</b>
CODEX	Codex 2233 modem
CODEX	Codex 2260 modem
DF03	DF03 Digital modem
DF112	DF112 Digital modem
DF224	DF224 Digital modem (Scholar)
HAYES	Hayes Smartmodem 2400

---

The MODEM parameter has two other possible values for incoming line types:

---

<b>Value for MODEM</b>	<b>Use</b>
DATA__LEADS__ONLY	The line is hard-wired to the node.
YES	A modem is connected to the line but you are not setting up the dial-back function.

---



The range of valid values depends on the setting for CONNECTION TYPE:

---

Value for CONNECTION TYPE	Valid Values for MODEM
INCOMING	DATA __LEADS __ONLY YES
DIALBACK	CODEX DF03 DF112 DF224 HAYES

---

**Considerations:** If you set this parameter incorrectly, the line will not work.

- **RECALL TIMER**

Specifies the number of minutes between each of the router's attempts to call a node on a dial-back line.

**Considerations:** This parameter is meaningful only if the line you are setting is a modem line to be used for automatic dial-back.

The default is 3 minutes; the range of valid values is 1 to 60.

- **SERVICE PASSWORD**

Specifies the DECnet service password that users at load hosts must enter with the NCP LOAD command and users at either load hosts or management hosts must enter with the NCP TRIGGER command (see Volume I, Section 3.5.1.2, for information about the DECnet service password).

If you define a DECnet service password, anyone, including you, at another node who tries to access the router to perform a remote maintenance activity usually must give this password.

**Considerations:** The service password provides security for the DECrouter 200 system, preventing unauthorized personnel from reloading DECrouter 200.

The default is 0, which means that the router does not check the DECnet service password (see Volume I, Section 3.5.1.2). The range of valid values is a hexadecimal string (the characters 0 to 9 and A to F) of from 1 to 16 characters.

## 1.1.4 Logging Parameters

Event logging is a service provided by DECnet nodes. On load hosts, DECnet event-logging messages can confirm that a down-line load to the router was successful (see Volume I, Section 5.6.3). On management hosts, event-logging messages provide status information about the router's operations (see Volume I, Section 6.4.3, and Volume I, Appendix B).

Operating system-specific information about setting up event logging is in the *DECrouter 200 Software Installation Guide* for the operating system of the load host. In addition, event logging is explained in the NCP documentation of each load host and management host operating system.

Event logging is enabled in the router's permanent database by default. By disabling event logging when appropriate, you can free the logging host of unnecessary processing. You may want to disable logging after you are satisfied that the router is operating properly.

When event logging is set up on a DECnet node, you can specify the destination, called either the **sink** or the **logging host**, of the messages.

Digital suggests that you set up one DECnet sink node to receive all the logging events associated with your router. In this way, all status information, including down-line loading status, is available at one convenient location.

To view the current values for event logging parameters, use the SHOW LOGGING command. To change these values, issue the SET LOGGING command. To clear these values, execute the CLEAR LOGGING command.

These are the router's parameters that control the logging of DECnet event messages, along with suggestions for setting values:

- **CONSOLE**  
Specifies the host's console as the logging sink. By default, logging is enabled at all three sinks.
- **EVENT**  
Identifies the kinds of events you want logged by class and type. Event classes are:
  - Network Management
  - Session Control
  - End Communication
  - Routing
  - Data Link
  - Physical Link

The default is all possible DECnet events, namely KNOWN EVENTS.

- **FILE**  
Specifies the host's DECnet event logging file as the logging sink. By default, logging is enabled at all three sinks.
- **KNOWN EVENTS**  
Refers to all six classes of the DECnet events that the router can generate.
- **MONITOR**  
Specifies the host's monitor as the logging sink. By default, logging is enabled at all three sinks.

### 1.1.5 Node Parameters

You can enter up to 1,023 node names in the database. As many as 100 nodes can have other defined parameters. Define as many parameters for a node as you need.

Set the DTEADDRESS parameter as part of establishing dial-back security (see the DTEADDRESS description below).

To view the current values for node parameters, use the SHOW NODE *node-id* or SHOW KNOWN NODES command. To change these values, issue the SET NODE command. To clear these values, execute the CLEAR NODE *node-id* or CLEAR KNOWN NODES command.

These are the router's node parameters, along with suggestions for setting values:

- **DTEADDRESS**  
Specifies the node's telephone number plus special characters. The router uses the value of this parameter to call a node on a line that has been set for dial-back security checks.

The DTEADDRESS must be in the format required by the particular modem on the line that connects this node (see Appendix C for details). The value for this parameter includes:

- The actual telephone number
- Control characters required by the modem
- Optional characters you can use to make your input more readable

There is no default; the range of valid values is a string of from 1 to 30 valid ASCII characters. Table 2-2 shows these valid characters.

**Considerations:** This parameter is meaningful only if you are setting up the node for automatic dial-back. All of the following parameters relate to dial-back security:

- CALL ATTEMPTS (Line parameter)
- CALL SETUP TIMER (Line parameter)
- CONNECTION TYPE (Line parameter)
- MODEM (Line parameter)
- RECALL TIMER (Line parameter)
- DTEADDRESS (Node parameter)

You must set this parameter if you want automatic dial-back to this node.

- **INBOUND TYPE**

Specifies a type identifier for the node. The router requires this identifier from the node in the routing initialization message before the router establishes a connection. This parameter is most useful for nodes on dial-in circuits.

The valid values are ENDNODE and ROUTER. There is no default.

**Considerations:** If the node is a DECrouter 200 node or any other routing node, specify ROUTER. If not, specify ENDNODE.

- **NAME**

Identifies the DECnet node name of the node. You can enter up to 1,023 node names in the database.

Node names are not necessary for the DECrouter 200's routing function. On the routing level, the router recognizes remote nodes solely by their DECnet node address.

However, names are convenient. You can specify them instead of DECnet node addresses when you issue further DRCP SET NODE commands and the DRCP SHOW NODE and CLEAR NODE commands. If you define a NAME for a node, you can also specify this name with network management NCP commands that require node IDs, such as the NCP SHOW NODE command.

**Considerations:** No names of remote nodes are known to the router unless you define them. By defining the node name of a remote node, you can identify and access that node by name. Specifying nodes by their names is usually easier than specifying them by their addresses.

No node names are defined by default; the range of valid values is a string of from 1 to 6 alphanumeric characters. At least one character must be a letter.

- **RECEIVE PASSWORD**

Specifies a password that the router uses to control access from an adjacent node connected by an asynchronous circuit. The node must send a matching transmit password to the router before communications proceed.

You can define receive passwords for as many as 100 nodes.

If you enable access verification for the node's circuit (SET CIRCUIT VERIFICATION ENABLED), the node cannot access the router without first supplying a password that matches the receive password you specified for this node. When the router verifies the password, the link becomes operational – the circuit state changes from ON-STARTING to ON.

In multiple area networks, this parameter is especially significant for circuits connecting adjacent DECnet Phase III nodes. Phase III nodes in a multiple area network must have a transmit password.

There is no default receive password and, in addition, access VERIFICATION is DISABLED by default; the range of valid values is a string of from 1 to 8 alphanumeric characters.

**Considerations:** If you specify a receive password, you can prevent unauthorized access from remote nodes using dial-in lines. The receive password helps ensure security from unauthorized dial-in connections.

- **TRANSMIT PASSWORD**

If an adjacent node connected by an asynchronous circuit has set up a receive password, TRANSMIT PASSWORD specifies a password that the router must supply to gain access to that node. Your router must send the transmit password you specified for this node to match the node's receive password before communications proceed.

You can define transmit passwords for as many as 100 nodes.

If a node has not set up a receive password, you do not have to specify a transmit password for this node.

There is no default transmit password; the range of valid values is a string of from 1 to 8 alphanumeric characters.

**Considerations:** If a node on one of the asynchronous circuits has its own receive password and therefore requires a password from the router, specify the same password as that node's transmit password. Define a transmit password only if the adjacent non-Ethernet node on the circuit requires it.

## 1.2 Introduction to DRCP

Use DRCP commands to specify values for DECrouter 200 parameters that determine how the router operates.

You can use DRCP to create a customized software image for one or more routers and to create alternate images, perhaps when you want to test the effectiveness of different software configurations.

DRCP is an automated program that prompts you for all the information you need to modify or display the permanent database. DRCP provides on-line help.

DRCP acts directly on the image file when you enter SET and CLEAR commands and then close the file. However, for your changes to affect the router, you must down-line load the changed image from a load host to your DECrouter 200 unit. Changes to the permanent database are called “permanent” because they are not affected when the router is reloaded.

### 1.2.1 Locating DRCP

DRCP is part of the DECrouter 200 software distribution kit. After the DECrouter 200 software installer performs the entire installation procedure described in the *DECrouter 200 Software Installation Guide*, DRCP is in the appropriate directory of each assigned load host for your router.

#### NOTE

For convenience, the *DECrouter 200 Management Guide* calls this load host directory the **server directory**.

For the name of this directory, see the *DECrouter 200 Software Installation Guide* for the load host’s operating system. On VAX/VMS load hosts, for example, this directory is SYS\$COMMON:[DECSERVER]. See Section 1.4 for information about invoking DRCP from the server directory.

The DECrouter 200 software image also resides on the router’s load hosts in the same directory. (The *DECrouter 200 Software Installation Guide* explains the installation and creation of router software image files.) This directory contains image files and all related utilities for various Ethernet communications server products. For example, in addition to files for DECrouter 200, you may also find files for:

- The DECrouter 2000 product
- The DECserver 100 product
- The DECserver 200 product
- The DECserver 500 product
- The Ethernet Terminal Server product
- The Terminal Server Manager product

The host on which you run DRCP can be any one of your router's load hosts. All router load hosts must have DECnet installed, but DECnet does not have to be running while you are making changes with DRCP commands.

Coordinate using DRCP with the load host system manager because, for most load host operating systems, you need certain privileges to run this utility.

## **1.2.2 Keeping a Record of Changes**

You may find it helpful to keep a record of your DRCP sessions. Before you open a software image file to customize the router's permanent database, you can issue the SET LOG-FILE command. This command makes a log file of all the DRCP commands you issue and all the prompts, messages, and displays that DRCP returns.

Note that DRCP log files have been enhanced from previous software versions so that the logs include all autoprompting and, if SET VERIFY is in effect, each issued command.

After you open an image file, especially if you plan to make more than one or two parameter changes, Digital strongly recommends that you first create two command files, one that resets the parameters to all default values and one that customizes the parameters as you specify them.

The CREATE COMMAND-FILE command automatically generates DRCP command files (see Section 1.9.1.2 for details).

## **1.2.3 Setting Related Parameters**

Some of the line parameters relate to dial-back security. If you want to use the dial-back feature, you must set the CONNECTION TYPE and MODEM parameters. The order in which you set these parameters is important. Set CONNECTION TYPE to DIALBACK first and then set the MODEM parameter.

## **1.2.4 Similarity of DRCP Commands and NCP Commands**

DRCP commands and the NCP commands for DECrouter 200 management have a similar command syntax. Some of the commands are the same, as you can change some parameter values both in the permanent database and in the operational database.

DRCP SET and CLEAR commands modify the router's permanent database. Volume I, Chapters 6 and 9, discuss the NCP commands you use for managing the operational database. See Volume I, Section 1.4.1, for an explanation of the differences between changing values in the permanent database, as opposed to changing values in the operational database.

## 1.2.5 Making Your Parameter Changes Effective

To make your customized parameters effective, down-line load the router's software image from a load host to the router. As soon as the new software is loaded, the values in the permanent database also become the values in the operational database.

## 1.3 Overview of DRCP Commands

This section outlines the DRCP commands. See Section 2.4 for guidelines to entering DRCP commands, Section 2.5 for a summary of the DRCP commands, and Section 2.6 for complete command descriptions.

There are several types of DRCP commands:

- On-line help  
The HELP command gives information about DRCP commands.
- File manipulation  
The OPEN, CLOSE, CREATE COMMAND-FILE, SET VERIFY, SET NOVERIFY, SET LOG-FILE, and SHOW IMAGE commands:
  - Open software image files
  - Close software image files
  - Create DRCP command files and control their execution
  - Create log files of DRCP sessions
  - Display information about DRCP sessions
- Parameter display  
The SHOW CIRCUIT, SHOW EXECUTOR, SHOW LINE, SHOW LOGGING, SHOW NODE, and SHOW SYSTEM commands display parameters.
- Parameter modification  
The SET CIRCUIT, SET EXECUTOR, SET LINE, SET LOGGING, SET NODE, CLEAR EXECUTOR, CLEAR LINE, CLEAR LOGGING, and CLEAR NODE commands modify parameters.
- Exiting  
The EXIT and QUIT commands exit DRCP.

See Chapter 2 for complete command descriptions showing command format, use, parameters, and examples. See Section 1.1 for parameter definitions, including what to consider when you are deciding on parameter values.



## 1.4 Invoking DRCP

Before you can invoke DRCP, the software must be installed on the load host. See the appropriate *DECrouter 200 Software Installation Guide* for details on installing the DECrouter 200 software distribution files.

On most systems, to use DRCP you must have privileges. See the load host's system manager.

For the commands to invoke DRCP, see the *DECrouter 200 Software Installation Guide* for the operating system of the load host you are using. The command to run the program varies for each supported operating system, but once you begin it, DRCP is identical on all load hosts. Here is an example for a VAX/VMS load host:

```
$ SET DEFAULT SYS$COMMON:[DECSEVER] (RET)
$ RUN DRCP.EXE (RET)
```

DECrouter 200 Configuration Program V1.1 (NON-PTT KIT)

DRCP>

## 1.5 Opening a DECrouter 200 Software Image File

The DECrouter 200 software image and the DRCP program are in the same server directory. For all load hosts, the image file is named RTR`node-name`.SYS, where `node-name` is the router's DECnet node name.

The OPEN command opens the software image file. At the DRCP prompt (DRCP>), issue the OPEN command and specify the name of the image file you want to open. The following example opens an image file named RTRRAVEN.SYS:

```
DRCP>OPEN RTRRAVEN.SYS (RET)
%DRCP-I-OPEN, software image RTRRAVEN.SYS opened successfully
DRCP>
```

See Section 2.5 for a complete command description of the OPEN command and its options.

Before opening a file, you can use the HELP, SET LOG-FILE, SET VERIFY, and SET NOVERIFY commands, but you cannot issue any CLEAR, CREATE COMMAND-FILE, SET, or SHOW commands until you execute the OPEN command.

## 1.6 Problems with Opening Files

If DRCP cannot open a DECrouter 200 software image file, one of several problems may exist:

- The image file you specified does not exist on this load host.
- The image file is not in the correct directory.
- You do not have the required privileges to access the file.

- The image file is currently being accessed by another DRCP user.
- You have another router software image file open.
- A down-line load of the software image is in process.
- The image file is invalidly formatted.
- The image file you specified is a different software version than the version of the DRCP program. They did not come from the same software kit.

If an error condition exists, DRCP displays an error message. The following list gives you all the possible DRCP error messages resulting from OPEN failures and the appropriate corrective actions you can take.

- %DRCP-E-OPENF, software image *filename* open failed

Perhaps you mistyped the file name or perhaps this system is not a load host for your router. To check for installed router software and image file names, follow these steps:

1. Exit DRCP.
2. Run ROUCONFIG.
3. Select the List option from the ROUCONFIG Menu (see the *DECrouter 200 Software Installation Guide*).

If the load host, directory, and file name are all correct, check the protection status of the file and directory. As router manager, you should have full access privileges. Speak to the load host system manager about obtaining these privileges, if necessary.

If another user has the same image file open, determine that person's identity and talk about router management responsibilities. It is best for one person to manage the router and be responsible for customizing its software image. If there is a backup manager, ensure that you are both aware of all changes to the router's permanent database and the reasons for the changes.

If a down-line load is in progress, you obviously did not initiate it. Try to determine why the router automatically reinitialized. Perhaps it did so because of a problem that you are about to correct by modifying the software image file.

- %DRCP-E-FILEOPEN, another software image is currently open

You tried to open an image file while another one is open. Close the open file and then try again.

- `%DRCP-E-READF`, read parameters failed, image corruption

The software image file has been corrupted. Delete it. If there is a copy on another load host, you can copy the file or you can create another one for your router with ROUCONFIG. Follow these steps:

1. Exit DRCP.
2. Run ROUCONFIG (see the *DECrouter 200 Software Installation Guide* for your load host's operating system).
3. Select the Delete option from the ROUCONFIG menu to remove the corrupted image file.
4. Select the Add option from the ROUCONFIG menu.
5. Either customize the new image file from the start or repeat all your previous changes. The second way is very fast if all the SET and CLEAR commands are in a command file, as Digital suggests.

Make the new changes that you were trying to make when you got the error message.

- `%DRCP-E-VERSIONSKEW`, DRCP and software image are different versions  
`%DRCP-I-VERSION`. This is DRCP version V1.1

You are using a version of DRCP that is different from the release of the image file you are trying to open. The information message displays the software version of the DRCP program you are running. Ensure that DRCP and the router image are from the same software distribution kit.

After displaying these two messages, DRCP exits and returns you to the system prompt.

See Appendix B for the meanings of all the DRCP messages and what to do about error situations.

## 1.7 Help and Autoprompting

DRCP offers two kinds of on-line help. The HELP command displays brief command descriptions and the autoprompting feature provides help with specifying values for individual parameters.

### 1.7.1 The HELP Command

If you are not sure how to enter DRCP commands, you can use the HELP command. You can issue HELP at any time at the DRCP > prompt, whether an image file is open or not. Type:

```
DRCP> HELP (RET)
```

DRCP displays:

Information available:

Autoprompt	CLEAR	CLOSE	CREATE	EXIT
HELP	OPEN	QUIT	SET	SHOW

Topic?

For further information, type one of the topics. DRCP gives you a brief description of the topic and lists any subtopics associated with it. DRCP then prompts you for a subtopic. For example:

Topic? SET (RET)

SET

Use the SET command to change network system parameters. The SET command can be issued to modify circuit, line, node, executor and logging characteristics.

Additional information available:

CIRCUIT	EXECUTOR	LINE	LOGGING	LOG-FILE	NODE	VERIFY
---------	----------	------	---------	----------	------	--------

Subtopic?

You can also start out by requesting help for a specific command. Type HELP and the command name, for example:

DRCP> HELP OPEN (RET)

OPEN

Use the OPEN command to open a software image to examine or modify the network system parameters. The OPEN command must be issued prior to any set/show commands that change network system parameters. The OPEN command can be issued with a /READ switch that will prevent the image from being modified (CLOSE/WRITE command will override this switch). Any modifications will be written into the software image).

For more help see HELP CLOSE.

EXAMPLES: DRCP>OPEN SYSTEM  
DRCP>OPEN/READ SYSTEM

Topic?

## 1.7.2 Autoprompting

Autoprompting is useful when you have entered the first keywords of a command and are not sure of the valid parameters or values.

After typing two command keywords, SET EXECUTOR or CLEAR NODE, for example, press the RETURN key and DRCP displays, usually line by line, each possible parameter for the command and the range of valid values. After each prompt line, you can either enter a value to make a change, or press the RETURN key for no change.

The following example shows autoprompting for the SET EXECUTOR command, with changes made to a few executor parameters:

```
DRCP> SET EXECUTOR (RET)
Broadcast Routing Timer      (5-120): (RET)
Buffer Size                  (246 - 1482): (RET)
Logging Host                 (Node or $HOST): (RET)
Maximum Address              (2 - 1023): (RET)
Maximum Broadcast Router    (1 - 32): (RET)
Maximum Broadcast Nonrouter (0 - 1022): (RET)
Maximum Cost                 (2 - 1022): 3 (RET)
Maximum Hops                 (1 - 30): (RET)
Nonprivileged Password      (Alphanumeric String): WINGS (RET)
Pathsplits                   (1 - 4): (RET)
Privileged Password         (Alphanumeric String): BIRDY (RET)
DRCP>
```

If you make a mistake while entering a command, DRCP informs you with an error message and provides help with the command syntax and parameters.

## 1.8 Displaying Parameters

Whenever you have an open image file, you can display its parameters with DRCP SHOW commands. Table 1-3 summarizes the functions of the DRCP SHOW commands.

**Table 1-3: Summary of DRCP SHOW Commands**

Command	Function
SHOW CIRCUIT	Displays the router's circuit parameters.
SHOW EXECUTOR	Displays the router's executor parameters.
SHOW IMAGE	Displays the name of the open software image file, its current read/write status, and the time and place it was last modified.
SHOW LINE	Displays the router's line parameters.
SHOW LOGGING	Displays assigned DECnet logging sinks and the kinds of events enabled for DECnet event logging.

(Continued)

**Table 1-3 (Cont.): Summary of DRCP SHOW Commands**

Command	Function
SHOW NODE	Displays defined node names and other defined characteristics for nodes in the router's database.
SHOW SYSTEM	Displays all parameter values in the open DECrouter 200 software image file: executor, lines, circuits, logging, and nodes. In addition, it displays DRCP session status on the open image.

The SHOW SYSTEM command is useful if you want to view or record all current parameters. To view all the parameters and values, simply issue SHOW SYSTEM. To record them, follow these steps:

1. At the DRCP > prompt, issue the SET LOG-FILE command to make a log of the SHOW SYSTEM display. On the command line, specify a name for the log file. This example opens a log file named RTRDOVE.LOG:

```
DRCP> SET LOG-FILE RTRDOVE.LOG (RET)
```

2. Open the software image file, for example:

```
DRCP> OPEN RTRDOVE.SYS (RET)
%DRCP-I-OPEN, software image RTRDOVE.SYS opened successfully
```

3. Issue the SHOW SYSTEM command:

```
DRCP> SHOW SYSTEM (RET)
```

You see the router parameters displayed while DRCP also saves the display in the log file.

4. When you are ready, close the image file in the manner you wish – CLOSE, QUIT, EXIT, or (CTRL/Z) ; when you exit DRCP, it automatically closes the log file, for example:

```
DRCP> EXIT (RET)
%DRCP-I-WRITEPARMS, writing network software parameters
%DRCP-I-CLOSE, software image RTRDOVE.SYS closed successfully
%DRCP-I-LOGCLOSE, log-file RTRDOVE.LOG closed successfully
$
```

Typing, printing, or editing the log file provides you with all the parameter values for your unit, whether they are default values or customized values.

The SHOW IMAGE display does not display router parameters but it is very helpful if you manage many units and forget the particular image file with which you are currently working. This command is also useful to remind you how you opened the current open file: for read only or for both read/write. In addition, SHOW IMAGE displays the date and node on which the image was last modified.

## 1.9 Using DRCP Command Files

You can execute DRCP commands from a command file. In fact, Digital suggests that instead of customizing the router's software image command by command, you create a command file with all the DRCP SET and CLEAR commands you want to execute and then run the command file. This approach has the following advantages:

- If you manage more than one router, customizing is easier because you can apply, using one step, the same set of commands to multiple images.
- If your router has more than one load host (as Digital recommends), customizing is easier because, again, you can apply the same set of commands to multiple images by copying and rerunning the command file.
- It is easy for you to define alternate software images, either to experiment with the efficiency of different values or to switch to an alternate image due to temporary network changes.

Using DRCP command files to customize the router's software image lets you safely and easily test different software configurations or use them temporarily as needed. You could use an alternate software image for testing purposes, such as evaluating the effects of different circuit parameters on performance. If the new values are not desirable, you can run a DRCP command file with default values to return to the original software image.

- It protects your efforts in case the software image becomes corrupted or deleted by mistake, and you need to reissue the same SET and CLEAR commands.
- It protects your efforts in case you mistakenly run a command file that resets all the defaults (see Section 1.11).
- The command file is a record of all the current values you defined. While you are managing the router with NCP, if you forget a value that does not show up on any NCP display, for example, the privileged password, you can type or print the command file for ready reference.

### NOTE

It is a good idea to read/write protect this file.

- It helps with problem analysis. If you need to submit a Software Performance Report (SPR), send along this command file to help Digital analyze the problem (see Volume I, Section 8.5.1).

## 1.9.1 Creating a Command File

You can use DRCP to create a command file of DRCP commands or you can create a DRCP command file of your own.

### NOTE

DRCP command files cannot be nested.

**1.9.1.1 Creating a File Manually** — Create a DRCP command file manually in the same way that you would create any command file:

1. Use the editor of your choice.
2. Open a new file, naming it with the appropriate extension, for example, .COM for VAX/VMS load host systems.
3. Type the SET and CLEAR commands you want to include.
4. For convenience, start with the OPEN command and end with the CLOSE command, if you plan to use this command file to customize only one particular software image.
5. If you wish to add comments, precede each line of a comment with an exclamation point (!).

**1.9.1.2 Creating a File Automatically** — To create a DRCP command file automatically, open an image file and then issue the CREATE COMMAND-FILE command.

You can open the file with either the OPEN or OPEN/READ command. With the file open for read only, you can specify new parameter values while the original software image file remains unchanged.

Follow these steps to automatically create a DRCP command file:

1. Open the default DECrouter 200 software image file with either the OPEN or OPEN/READ command. Digital suggests that you use OPEN/READ.
2. Create a command file with all the default values, to restore the default image. Issue the CREATE COMMAND-FILE command and specify a name for the file. The following VAX/VMS example opens the default image file RTRDOVE.SYS for a router named DOVE and creates a command file with all defaults named RTRDOVE\_\_DEFAULTS.COM:

```
DRCP> OPEN RTRDOVE.SYS (RET)
%DRCP-I-OPEN, software image RTRDOVE.SYS opened successfully
DRCP> CREATE COMMAND-FILE RTRDOVE_DEFAULTS.COM (RET)
%DRCP-I-CREATE, command file RTRDOVE_DEFAULTS.COM created successfully
DRCP> CLOSE (RET)
%DRCP-I-WRITEPARMS, writing network software parameters
%DRCP-I-CLOSE, software image RTRDOVE.SYS closed successfully
DRCP>
```



The command file is closed. You now have a command file with SET commands that restore default values. See Section 1.11 for a discussion of the usefulness of this file.

### NOTE

On an MS-DOS load host, .BAT is the file-name extension for a DRCP command file.

3. Reopen the default software image file with either the OPEN or OPEN/READ command. Issue the appropriate SET and CLEAR commands (see Section 1.1 for guidelines when you are deciding on values to change). Issue the CREATE COMMAND-FILE command and specify a name for the file.

The next VAX/VMS example opens RTRDOVE.SYS for read only to protect it and creates a command file named RTRDOVE\_\_CUSTOM.COM with all the current values — both the defaults you did not change and the new values you specified:

```
DRCP> OPEN/READ RTRDOVE.SYS (RET)
%DRCP-I-OPEN, software image RTRDOVE.SYS opened successfully
DRCP> SET ... (RET)
.
.
.
DRCP> SET ... (RET)
DRCP> CREATE COMMAND-FILE RTRDOVE_CUSTOM.COM (RET)
%DRCP-I-CREATE, command file RTRDOVE_CUSTOM.COM created successfully
DRCP> CLOSE (RET)
%DRCP-I-WRITEPARMS, writing network software parameters
%DRCP-I-CLOSE, software image RTRDOVE.SYS closed successfully
DRCP>
```

## 1.9.2 Running a Command File

Run a DRCP command file any time you need to restore all the default values (specify the command file that sets the defaults) or to restore the customized software image (specify the command file that customizes as you specified).

To run a DRCP command file, type the “at” symbol (@) followed by the file name at the DRCP> prompt. To see each command displayed as it is executed, enter the SET VERIFY command before running the command file. (SET NOVERIFY is the default.)

The following example runs a DRCP command file named RTRDOVE\_\_CUSTOM.COM on VAX/VMS to customize the image file RTRDOVE.SYS. The default SET NOVERIFY is in effect so that DRCP does not display the commands as they execute.

```
$ SET DEFAULT SYS_$COMMON:[DECSEVER] (RET)
$ RUN DRCP (RET)
```

DECrouter 200 Configuration Program V1.1 (NON-PTT KIT)

```
DRCP>@RTRDOVE_CUSTOM.COM (RET)
%DRCP-I-OPEN, software image RTRDOVE.SYS opened successfully
%DRCP-I-WRITEPARMS, writing network software parameters
%DRCP-I-CLOSE, software image RTRDOVE.SYS closed successfully
DRCP>
```

### 1.9.3 Examples of DRCP Command Files

This section shows two hard-copy printouts of command files generated by the CREATE COMMAND-FILE command on VAX/VMS:

- The command file generated when the router software image contains all default values
- A command file generated after SET commands have modified some parameters

In the first example, the router is named DOVE, its image file is RTRDOVE.SYS, and the command file is named RTRDOVE\_\_DEFAULTS.COM.

```
!
!DECrouter 200 command file RTRDOVE__DEFAULTS.COM - Wed Jan 11 12:06:39 1989
!
OPEN RTRDOVE.SYS
SET EXECUTOR MAXIMUM ADDRESS 1023
SET EXECUTOR MAXIMUM BROADCAST ROUTERS 32
SET EXECUTOR MAXIMUM BROADCAST NONROUTERS 1022
SET EXECUTOR MAXIMUM HOPS 30
SET EXECUTOR MAXIMUM COST 1022
SET EXECUTOR BUFFER SIZE 576
SET EXECUTOR PATHSPLITS 1
SET LINE ASYNC-1 CONNECTION TYPE INCOMING
SET LINE ASYNC-1 LINE SPEED 9600 MODEM DATA__LEADS__ONLY
SET LINE ASYNC-1 CALL ATTEMPTS 3 CALL SETUP TIMER 60 RECALL TIMER 3
SET LINE ASYNC-2 CONNECTION TYPE INCOMING
SET LINE ASYNC-2 LINE SPEED 9600 MODEM DATA__LEADS__ONLY
SET LINE ASYNC-2 CALL ATTEMPTS 3 CALL SETUP TIMER 60 RECALL TIMER 3
SET LINE ASYNC-3 CONNECTION TYPE INCOMING
SET LINE ASYNC-3 LINE SPEED 9600 MODEM DATA__LEADS__ONLY
SET LINE ASYNC-3 CALL ATTEMPTS 3 CALL SETUP TIMER 60 RECALL TIMER 3
SET LINE ASYNC-4 CONNECTION TYPE INCOMING
SET LINE ASYNC-4 LINE SPEED 9600 MODEM DATA__LEADS__ONLY
SET LINE ASYNC-4 CALL ATTEMPTS 3 CALL SETUP TIMER 60 RECALL TIMER 3
```

```

SET LINE ASYNC-5 CONNECTION TYPE INCOMING
SET LINE ASYNC-5 LINE SPEED 9600 MODEM DATA__LEADS__ONLY
SET LINE ASYNC-5 CALL ATTEMPTS 3 CALL SETUP TIMER 60 RECALL TIMER 3
SET LINE ASYNC-6 CONNECTION TYPE INCOMING
SET LINE ASYNC-6 LINE SPEED 9600 MODEM DATA__LEADS__ONLY
SET LINE ASYNC-6 CALL ATTEMPTS 3 CALL SETUP TIMER 60 RECALL TIMER 3
SET LINE ASYNC-7 CONNECTION TYPE INCOMING
SET LINE ASYNC-7 LINE SPEED 9600 MODEM DATA__LEADS__ONLY
SET LINE ASYNC-7 CALL ATTEMPTS 3 CALL SETUP TIMER 60 RECALL TIMER 3
SET LINE ASYNC-8 CONNECTION TYPE INCOMING
SET LINE ASYNC-8 LINE SPEED 9600 MODEM DATA__LEADS__ONLY
SET LINE ASYNC-8 CALL ATTEMPTS 3 CALL SETUP TIMER 60 RECALL TIMER 3
SET CIRCUIT ASYNC-1 COST 4 HELLO TIMER 30 STATE OFF VERIFICATION DISABLED
SET CIRCUIT ASYNC-2 COST 4 HELLO TIMER 30 STATE OFF VERIFICATION DISABLED
SET CIRCUIT ASYNC-3 COST 4 HELLO TIMER 30 STATE OFF VERIFICATION DISABLED
SET CIRCUIT ASYNC-4 COST 4 HELLO TIMER 30 STATE OFF VERIFICATION DISABLED
SET CIRCUIT ASYNC-5 COST 4 HELLO TIMER 30 STATE OFF VERIFICATION DISABLED
SET CIRCUIT ASYNC-6 COST 4 HELLO TIMER 30 STATE OFF VERIFICATION DISABLED
SET CIRCUIT ASYNC-7 COST 4 HELLO TIMER 30 STATE OFF VERIFICATION DISABLED
SET CIRCUIT ASYNC-8 COST 4 HELLO TIMER 30 STATE OFF VERIFICATION DISABLED
SET CIRCUIT ETHER-1 COST 1 HELLO TIMER 30 ROUTING PRIORITY 64 STATE ON
SET LOGGING CONSOLE
SET LOGGING MONITOR
SET LOGGING FILE
SET LOGGING KNOWN EVENTS
CLOSE

```

The following example shows a typical command file that can be used to customize some parameters for router DOVE, whose image file is named RTRDOVE.SYS. The command file is named RTRDOVE\_\_CUSTOM.COM. This command file has DRCP SET commands that:

- Define network management passwords for the router
- Specify a logging host
- Modify other executor parameters
- Set up dial-back security for lines ASYNC-2, ASYNC-3, ASYNC-4, ASYNC-5, and ASYNC-6
- Set up line ASYNC-7 to support a modem
- Set up circuit ASYNC-1 to run the Local Monitor
- Turn on the router's other asynchronous circuits

- Enable access verification for some of the circuits
- Define three node names and set up access security for them, including the dial-back security feature:
  - Node SWANS
  - Node GEESE
  - Node DUCKY

The customized parameters appear in **boldface** type.

```

!  

!DECrouter 200 command file RTRDOVE__CUSTOM.COM - Wed Jan 11 12:26:39 1989  

!  

OPEN RTRDOVE.SYS  

SET EXECUTOR MAXIMUM ADDRESS 999  

SET EXECUTOR MAXIMUM BROADCAST ROUTERS 10  

SET EXECUTOR MAXIMUM BROADCAST NONROUTERS 998  

SET EXECUTOR MAXIMUM HOPS 5  

SET EXECUTOR MAXIMUM COST 5  

SET EXECUTOR BUFFER SIZE 576  

SET EXECUTOR PATHSPLITS 2  

SET EXECUTOR PRIVILEGED PASSWORD BIRDY  

SET EXECUTOR NONPRIVILEGED PASSWORD WINGS  

SET EXECUTOR LOGGING HOST NENE  

SET LINE ASYNC-1 CONNECTION TYPE INCOMING  

SET LINE ASYNC-1 LINE SPEED 9600 MODEM DATA__LEADS__ONLY  

SET LINE ASYNC-1 CALL ATTEMPTS 3 CALL SETUP TIMER 60 RECALL TIMER 3  

SET LINE ASYNC-2 CONNECTION TYPE DIALBACK  

SET LINE ASYNC-2 LINE SPEED 1200 MODEM DF03  

SET LINE ASYNC-2 CALL ATTEMPTS 3 CALL SETUP TIMER 60 RECALL TIMER 3  

SET LINE ASYNC-3 CONNECTION TYPE DIALBACK  

SET LINE ASYNC-3 LINE SPEED 1200 MODEM DF03  

SET LINE ASYNC-3 CALL ATTEMPTS 5 CALL SETUP TIMER 90 RECALL TIMER 1  

SET LINE ASYNC-4 CONNECTION TYPE DIALBACK  

SET LINE ASYNC-4 LINE SPEED 2400 MODEM HAYES  

SET LINE ASYNC-4 CALL ATTEMPTS 8 CALL SETUP TIMER 120 RECALL TIMER 1  

SET LINE ASYNC-5 CONNECTION TYPE DIALBACK  

SET LINE ASYNC-5 LINE SPEED 2400 MODEM DF224  

SET LINE ASYNC-5 CALL ATTEMPTS 3 CALL SETUP TIMER 60 RECALL TIMER 3  

SET LINE ASYNC-6 CONNECTION TYPE DIALBACK  

SET LINE ASYNC-6 LINE SPEED 1200 MODEM DF03  

SET LINE ASYNC-6 CALL ATTEMPTS 3 CALL SETUP TIMER 60 RECALL TIMER 3

```

```

SET LINE ASYNC-7 CONNECTION TYPE INCOMING
SET LINE ASYNC-7 LINE SPEED 1200 MODEM YES
SET LINE ASYNC-7 CALL ATTEMPTS 3 CALL SETUP TIMER 60 RECALL TIMER 3
SET LINE ASYNC-8 CONNECTION TYPE INCOMING
SET LINE ASYNC-8 LINE SPEED 9600 MODEM DATA __LEADS__ ONLY
SET LINE ASYNC-8 CALL ATTEMPTS 3 CALL SETUP TIMER 60 RECALL TIMER 3
SET LINE ETHER-1 SERVICE PASSWORD FF44
SET CIRCUIT ASYNC-1 COST 4 HELLO TIMER 30 STATE MONITOR VERIFICATION DISABLED
SET CIRCUIT ASYNC-2 COST 4 HELLO TIMER 30 STATE ON VERIFICATION ENABLED
SET CIRCUIT ASYNC-3 COST 4 HELLO TIMER 30 STATE ON VERIFICATION ENABLED
SET CIRCUIT ASYNC-4 COST 4 HELLO TIMER 30 STATE ON VERIFICATION ENABLED
SET CIRCUIT ASYNC-5 COST 4 HELLO TIMER 30 STATE ON VERIFICATION ENABLED
SET CIRCUIT ASYNC-6 COST 4 HELLO TIMER 30 STATE ON VERIFICATION ENABLED
SET CIRCUIT ASYNC-7 COST 4 HELLO TIMER 30 STATE ON VERIFICATION ENABLED
SET CIRCUIT ASYNC-8 COST 4 HELLO TIMER 30 STATE ON VERIFICATION ENABLED
SET CIRCUIT ETHER-1 COST 1 HELLO TIMER 30 ROUTING PRIORITY 64 STATE ON
SET NODE 55.1 NAME SWANS
SET NODE 55.1 RECEIVE PASSWORD CYGNET
SET NODE 55.1 DTEADDRESS 1-(617)555-2222
SET NODE 55.1 INBOUND TYPE ENDNODE
SET NODE 55.2 NAME GEESE
SET NODE 55.2 TRANSMIT PASSWORD GANDER
SET NODE 55.2 RECEIVE PASSWORD GOSLING
SET NODE 55.2 DTEADDRESS T(617)555-4444
SET NODE 55.2 INBOUND TYPE ENDNODE
SET NODE 55.3 NAME DUCKY
SET NODE 55.3 TRANSMIT PASSWORD DRAKE
SET NODE 55.3 RECEIVE PASSWORD DUCKLING
SET NODE 55.3 DTEADDRESS P-9-P-555-6666
SET NODE 55.3 INBOUND TYPE ENDNODE
SET LOGGING CONSOLE
SET LOGGING MONITOR
SET LOGGING FILE
SET LOGGING KNOWN EVENTS
CLOSE

```

## 1.10 Creating a Node Configuration Command File

One of the DECrouter 200 software distribution files, called the DECrouter 200 Node List Builder, is a utility that generates a very useful DRCP command file. The name of the distribution file in VAX/VMS kits is `NODE__COMMAND__BLD.EXE`. For the name of this file for each load host, see Appendix A in the *DECrouter 200 Software Installation Guide* for the appropriate operating system.

The DECrouter 200 Node List Builder helps you create a node configuration command file that you can then use instead of issuing individual SET NODE *node-number* NAME *node-name* commands. This command file, which you name, automatically defines node names in the router's permanent database. Usually, you have many node names to enter, perhaps over 1000, so defining names with a command file is a time-saving method.

It is probably most convenient to create a node configuration command file at the load host from which you will next run DRCP, although this location is not required.

The following example shows the procedure from a VAX/VMS node named MYBIRD with eight node definitions. It uses the default executor (the local node) and names the created file NODES.LIS. To create a node configuration command file, follow these steps:

1. Issue the NCP SHOW KNOWN NODES SUMMARY command to generate a list of DECnet node addresses with their associated node names. On the command line, direct the list to a file with any name you wish to give it, for example:

```
$ MCR NCP SHOW KNOWN NODES SUMMARY TO NODES.LIS (RET)
```

2. If you wish, type the file to glance at the list of nodes, for example:

```
$ TYPE NODES.LIS (RET)
```

```
Known Node Volatile Summary as of 12-Jan-1989 12:43:31
```

```
Executor node = 55.567 (MYBIRD)
```

```
State                = on
Identification       = DECnet-VAX V4.6,  VMS V4.6
Active links         = 2
```

Node	State	Active Links	Delay	Circuit	Next node
1.1 (ENETO1)				BNT-0	4.378 (LKGRT3)
1.2 (ENETO2)				BNT-0	4.378 (LKGRT3)
1.3 (ENETO3)				BNT-0	4.378 (LKGRT3)
1.4 (ENETO4)				BNT-0	4.378 (LKGRT3)
1.5 (ENETO5)				BNT-0	4.378 (LKGRT3)
1.6 (ENETO6)				BNT-0	4.378 (LKGRT3)
1.7 (ENETO7)				BNT-0	4.378 (LKGRT3)
1.8				BNT-0	4.378 (LKGRT3)

## NOTE

Since the purpose of the utility is entering names in the router's database, if a DECnet node address does not have an associated node name, as is the case with example node 1.8, the utility omits the node from the final node configuration command file.

3. At your system prompt, run the Node List Builder utility to create the command file. Answer the program's two prompts with the appropriate file names:
  - The name of the file with the list of node names
  - The name you want to give to the new command file

Here, the same file NODES.LIS is used to generate a command file called NODES.COM:

```
$ SET DEFAULT SYS$COMMON:[DECSERVER] (RET)
```

```
$ RUN NODE_COMMAND_BLD (RET)
```

```
DECrouter 200 V1.1 Node List Builder
```

```
Please enter input node list file spec [dev:file.ext]: NODES.LIS (RET)
```

```
Please enter output node command file spec [dev:file.ext]: NODES.COM (RET)
```

The final result, NODES.COM, looks like this:

```
$ TYPE NODES.COM (RET)
```

```
set node 1.1 name ENETO1
set node 1.2 name ENETO2
set node 1.3 name ENETO3
set node 1.4 name ENETO4
set node 1.5 name ENETO5
set node 1.6 name ENETO6
set node 1.7 name ENETO7
```

The result of using the DECrouter 200 Node List Builder is a command file that contains many DRCP SET NODE commands, each identifying the node name associated with a particular DECnet node address.

After you create this node configuration command file, you can merge it and an existing DRCP command file that customizes the router's software image. Edit the file that customizes. Put the SET NODE *node-number* NAME *node-name* commands at the top of the file so that later SET NODE commands can accept node names on the command line.

## 1.11 Resetting All Parameter Values to the Defaults

There are several possible reasons for wanting to reset, all at one time, all of the router's parameters to default values. Remember that resetting default values erases all your customized router parameters. Digital recommends that you always customize by putting your SET commands in one DRCP command file and that you reset all the defaults in the router's software image only when necessary.

If you want to return all router values to the original defaults, follow one of these two possible procedures:

- Run the DRCP command file you previously created with the CREATE COMMAND-FILE command (see Section 1.9.1.2).

This command file, in the load host's server directory, contains SET commands to reset parameter default values. However, note that some parameters, for example, passwords, do not have defaults. Once you set values for these parameters, you must use CLEAR commands to delete them from the database.

The "default" DRCP command file does not have CLEAR commands but after you create this file, you can edit it to add CLEAR commands.

- Copy your router's software image file to a file with another name to save it. Then use ROUCONFIG to delete the current software image file and create a new one (see Volume I, Chapter 4, for an overview of ROUCONFIG and see the *DECrouter 200 Software Installation Guide* for directions).

Use the Delete option of the ROUCONFIG command file, in the load host's server directory, to delete the current software image file. Use the Add option of ROUCONFIG to create a new software image for your router. The new image has all default values.

Digital recommends the first method. You can use the "defaults" command file as a ready reference on router default values. To view a hard copy, see Section 1.9.3. You can also type or print the file from the server directory.

## 1.12 Ensuring Against and Restoring Lost Changes

The best way to ensure against lost changes to a DECrouter 200 software image file is to put all DRCP SET commands for customizing into a command file. This method is effective whether the file is mistakenly deleted or accidentally corrupted. See Section 1.9 for information about DRCP command files.



There are two ways to restore a customized software image, should the file be mistakenly deleted or accidentally corrupted:

1. If you previously customized your router's software image by putting all the necessary DRCP SET commands in a command file, as Digital suggests, invoke DRCP, open the software image, and run the command file again.
2. If another load host has the customized file with all the latest changes, copy this image file from load host to load host.

Digital recommends the first method.

### **1.13 After Running DRCP**

After you finish customizing values, ensure that every load host assigned to your router has the updated software image. Repeat your DRCP session at the other load hosts. This procedure is especially easy if you put all the commands in a DRCP command file, which Digital recommends, and then copy the command file to the other load hosts.

Digital suggests that you do not copy the updated image file itself from load host to load host. However, if you do, be sure that you maintain only one version, the latest version, of the file in a load host's server directory.

When all the load hosts have the new software image file, down-line load it to your router. You can initiate a down-line load from your router (see Volume I, Section 5.2.1) or from a load host (see Volume I, Section 5.2.2) or from a management host (see Volume I, Section 5.2.3).

# 2

## DRCP Command Descriptions

This chapter describes all the DRCP commands. Use this chapter as a reference when you are issuing DRCP commands to customize your router's software image file.

### NOTE

Before using DRCP for the first time, read Chapter 1 to learn about customizing the router's software image on a load host. Chapter 1 also fully explains the router's parameters and gives you guidelines for choosing values. Chapter 1 is tutorial in nature.

You can make many parameter changes in both the router's permanent and operational databases. Digital suggests that you modify your router's databases only after you understand the differences between making changes in the permanent database versus making them in the operational database. Section 1.4.1 in Volume I explains these differences.

The execution of DRCP commands usually produces a message. See Appendix B for a list of DRCP error and information messages and their meanings.

## 2.1 Conventions Used for Command Descriptions

The format for each command follows the graphic conventions in the Preface. In addition, the command descriptions follow these conventions:

- The command descriptions are presented in alphabetical order.
- Each command description includes:
  - A short statement of the command's use
  - The complete command syntax
  - A brief description of each parameter, including its possible values and defaults
  - Examples
- Each example of the SHOW commands includes a complete display. Depending on your management host, NCP SHOW commands may display all the router's parameters or only a partial list.
- Each command format indicates whether the possible parameters are required or optional.
- Each command format shows the possible parameters alphabetically.
- Each command format **boldfaces** the default parameter and the default parameter values.
- After the command format, the parameter definitions are presented alphabetically by parameter. These definitions conclude with the valid values and defaults.

## 2.2 Example of Syntax Conventions

The following example reflects the graphic conventions used in this manual and the command description conventions used in this chapter and in Volume I, Chapter 9.

```

SET CIRCUIT ASYNC-n { COST n
                       HELLO TIMER seconds
                       STATE { ON
                              OFF
                              MONITOR }
                       VERIFICATION { DISABLED
                                       ENABLED
                                       INBOUND } }

```

or

```

SET CIRCUIT ETHER-1 { COST n
                     HELLO TIMER seconds
                     ROUTING PRIORITY n
                     STATE { ON
                             OFF } }

```

When issuing this command, you must specify ASYNC-*n* or ETHER-1. If you choose ASYNC-*n*, you must specify a circuit, represented by *n*.

You must specify at least one parameter, although you can specify as many as you want. After the parameter, you must specify a value. For example, after typing STATE, you must also type one value, either ON or OFF.

Bold type indicates a default value. For example, VERIFICATION has three valid values and DISABLED is the default. Italics indicates a variable string that you must specify. For example, after you type HELLO TIMER you must specify the number of seconds.

## 2.3 Definitions of Common Variables

The DRCP command descriptions in this chapter frequently use the following variables:

**ASYNC-*n*** The number of an asynchronous circuit or asynchronous line: 1 through 8, corresponding to ports 1 through 8. The ports are labeled J1 through J8 on the DECrouter 200 hardware unit.

***dialing-string*** The DTE address (phone number) plus any special characters that the router uses for dial-back security calls. The *dialing-string* is the value of the DTEADDRESS node parameter. **DTE** means **data terminal equipment device**.

**ETHER-1** The Ethernet circuit or Ethernet line running from the Ethernet port on the DECrouter 200 hardware unit.

<i>event-number</i>	A code for a particular kind of DECnet event. Specify event numbers in the form <i>class.type</i> . For example, event code 0.3 refers to automatic service events including down-line loads and event code 0.7 refers to aborted service events. All the event logging codes are listed in Volume I, Appendix B.
<i>hex-password</i>	A string of from 1 to 16 hexadecimal digits (the characters 0 to 9 and A to F) that name a password for the DECnet service password (with the SET LINE command). For example, FF44 is a valid <i>hex-password</i> .
<i>node-address</i>	A DECnet node address. Each DECnet node address must be a unique decimal number from 1 to 1023.  If your DECnet network is divided into areas, each DECnet node address takes the form <i>area.node-number</i> . Here, <i>area</i> is a decimal area number from 2 to 63, <i>node-number</i> is the node address, and the period distinguishes area from address. For example, 2.1003 is a valid node address.
<i>node-id</i>	A DECnet node name or a DECnet node address is valid.
<i>node-name</i>	A valid DECnet node name. DECnet node names must be from 1 to 6 alphanumeric characters. At least one character must be a letter.
<i>nonpriv-password</i>	A string of from 1 to 39 alphanumeric characters that names a network management nonprivileged password for your router. Defining this password makes any future NCP SHOW command that executes at the router a privileged operation.
<i>priv-password</i>	A string of from 1 to 39 alphanumeric characters that names a network management privileged password for your router. Defining this password makes any future privileged NCP command that executes at the router a privileged operation.

## 2.4 Guidelines for Entering DRCP Commands

When you issue DRCP commands, follow these guidelines:

- You can abbreviate command keywords to the smallest number of characters that distinguishes the keyword to DRCP, usually three characters for each word. (Exceptions are noted.)

For example, the SET EXECUTOR command has a parameter called PRIVILEGED PASSWORD. To set BIRDY as the password, you can enter this command as follows:

```
DRCP> SET EXE PRI PAS BIRDY (RET)
```

- If a command can take multiple parameters, you can enter several parameters on one command line in any order. Each command format lists the possible parameters alphabetically, but this order is presented only for easy look-up reference.

On the command line, leave one space between each parameter.

- DRCP provides autoprompting.

If a command requires at least one parameter, you can type the command's verb-noun combination and then simply press the RETURN key. DRCP prompts you parameter by parameter for the required information. The prompts include the valid values (see Section 1.7.2 on autoprompting).

If a parameter requires that you specify a value, you can type the verb-noun-parameter combination and then press the RETURN key. DRCP prompts you for a value. Each prompt includes the valid values (see Section 1.7.2 on autoprompting).

After the autoprompt, if you do not enter any data and press the RETURN key, there is no change and DRCP returns you to the DRCP > prompt.

- For SET, SHOW, and CLEAR commands, when you want to specify all the possible targets – for example, all DECnet events (*event-number*), all circuits (*circuit-id*), all lines (*line-id*), or all nodes (*node-id*) – you can use an asterisk (\*) as a wildcard character instead of issuing multiple commands. For example, the following commands affect all nodes, lines, circuits, and events, respectively:

```
DRCP> SHOW NODE * (RET)
DRCP> SHOW LINE * (RET)
DRCP> SET CIRCUIT ASYNC-* STATE ON (RET)
DRCP> CLEAR LOGGING EVENT *.* (RET)
```

To specify all the asynchronous lines, type ASYNC-\* as the line ID. Likewise, to specify the asynchronous circuits, type ASYNC-\* as the circuit ID.

If you want to change a parameter for all the lines (or all the circuits) except for one or two, you can save time by first using the wildcard character to change the parameters for all the lines (or all the circuits) and then issuing additional SET commands to specify the exceptions, for example:

```
DRCP> SET CIRCUIT ASYNC-* STATE ON (RET)
DRCP> SET CIRCUIT ASYNC-1 STATE MONITOR (RET)
```

- For most SET, SHOW, and CLEAR commands, the wildcard character \* has the equivalent keyword KNOWN, such as KNOWN CIRCUITS, KNOWN LINES, KNOWN EVENTS, and KNOWN NODES. The following commands in each pair, for example, are equivalent:

```
DRCP> SHOW NODE * (RET)
DRCP> SHOW KNOWN NODES (RET)

DRCP> CLEAR LOGGING EVENT *.* (RET)
DRCP> CLEAR LOGGING KNOWN EVENTS (RET)
```

- The SHOW commands are useful for verifying current settings. By default, the parameters are displayed at your terminal. To additionally direct output to a log file, use the SET LOG-FILE command.
- For on-line information, type the HELP command. See the HELP command description.

## 2.5 DRCP Command Summary

Table 2-1 summarizes the functions of the DRCP commands.

**Table 2-1: Summary of DRCP Commands**

Command	Function
CLEAR EXECUTOR	Clears either the router's network privileged password or its network nonprivileged password.
CLEAR LINE	Clears the router's DECnet service password.
CLEAR LOGGING	Clears the assignment of logging sinks and disables DECnet event logging.
CLEAR NODE	Clears node names or other node parameters from the router's database.

(Continued)

**Table 2–1 (Cont.): Summary of DRCP Commands**

<b>Command</b>	<b>Function</b>
CLOSE	Closes the open DECrouter 200 software image file without exiting DRCP.
CREATE COMMAND-FILE	Creates a command file that sets all parameters to the current values.
EXIT	Closes the open DECrouter 200 software image file, saves any changes, and exits DRCP.
HELP	Displays information about DRCP commands.
OPEN	Opens a DECrouter 200 software image file.
QUIT	Closes the open DECrouter 200 software image file without saving any of the current session's changes to this image, and exits DRCP.
SET CIRCUIT	Defines and modifies the router's circuit parameters.
SET EXECUTOR	Defines and modifies the router's executor parameters.
SET LINE	Defines and modifies the router's line parameters.
SET LOGGING	Defines and modifies assigned DECnet logging sinks and the kinds of events you want to log.
SET NODE	Defines and modifies parameters for remote nodes.
SET LOG-FILE	Creates a log file of all the DRCP commands you enter during a session, including messages, information displays, and autoprompting.
SET VERIFY/NOVERIFY	Enables or disables the display of the commands in a DRCP command file as they execute.
SHOW CIRCUIT	Displays the router's circuit parameters.
SHOW EXECUTOR	Displays the router's executor parameters.
SHOW IMAGE	Displays the name of the open software image file, its current read/write status, and when and where it was last modified.
SHOW LINE	Displays the router's line parameters.
SHOW LOGGING	Displays assigned DECnet logging sinks and the kinds of events enabled for DECnet event logging.
SHOW NODE	Displays defined node names and other defined node parameters.
SHOW SYSTEM	Displays all these parameter values in the open DECrouter 200 software image file: executor, lines, circuits, logging, and nodes. In addition, displays DRCP session status on the open image.



## **2.6 Command Descriptions**

The rest of this chapter presents complete descriptions of all the DRCP commands. Because these command descriptions are for reference, the parameter definitions here are quite brief. For more information about parameters, see the definitions in Section 1.1. These definitions include guidelines to help you choose the correct and the most efficient values.

If you are already familiar with running DRCP and executing DRCP commands, you may need only to refresh your memory with the summary of DRCP command syntax (see Appendix A).

---

## CLEAR EXECUTOR

This command clears the router's privileged password or nonprivileged password as previously defined with the SET EXECUTOR command. The result is that some formerly privileged NCP operations are no longer protected.

Digital highly recommends that you do not clear your router's network management passwords. (If you want to change password definitions, use the SET EXECUTOR command.)

### Format

CLEAR EXECUTOR PRIVILEGED PASSWORD

or

CLEAR EXECUTOR NONPRIVILEGED PASSWORD

where

NONPRIVILEGED PASSWORD

clears the router's nonprivileged password.

PRIVILEGED PASSWORD

clears the router's privileged password.

### Examples

```
DRCP> CLEAR EXECUTOR NONPRIVILEGED PASSWORD (RET)
```

```
DRCP> CLEAR EXECUTOR PRIVILEGED PASSWORD (RET)
```

---

## CLEAR LINE

This command clears the router's DECnet service password as previously defined with the SET LINE command. The result of clearing the service password is that, after one down-line load, any NCP user can issue the NCP LOAD and TRIGGER commands to initiate another down-line load of the router's software image to the router.

Digital highly recommends that you do not clear the DECnet service password for your router in its permanent database. To change passwords, use the SET LINE command.

### Format

CLEAR LINE ETHER-1 SERVICE PASSWORD

where

ETHER-1

identifies the router's Ethernet line.

SERVICE PASSWORD

is the DECnet service password you defined with the SET LINE ETHER-1 SERVICE PASSWORD command.

### Example

```
DRCP> CLEAR LINE ETHER-1 SERVICE PASSWORD (RET)
```

---

## CLEAR LOGGING

This command clears the assignment of logging hosts (sinks). The command also disables the logging of a specific kind of event or of all events.

### Format

```
CLEAR LOGGING { CONSOLE  
                EVENT event-number  
                FILE  
                KNOWN EVENTS  
                MONITOR }
```

where

#### CONSOLE

clears the host's console as the logging sink.

#### EVENT

identifies the kinds of events you do not want to log.

Specify event numbers in the form *class.type*. For example, event code 0.3 refers to automatic service events including down-line loads and event code 0.7 refers to aborted service events (event logging codes are listed in Volume I, Appendix B).

#### FILE

clears the host's DECnet event logging file as the logging sink.

#### KNOWN EVENTS

clears all possible DECnet events:

---

Event Layer	Events
Network Management	= 0.0, 0.4-0.7, 0.9
Session Control	= 2.0-1
End Communication	= 3.1-2
Routing	= 4.0-6, 4.8-12, 4.14-16, 4.18
Data Link	= 5.3-4, 5.14-15
Physical Link	= 6.0, 6.2

---

## CLEAR LOGGING

Clearing KNOWN EVENTS means that absolutely no DECnet events affecting the router will be logged.

### MONITOR

clears the host's monitor as the logging sink.

#### Example 1

```
DRCP> CLEAR LOGGING CONSOLE KNOWN EVENTS (RET)
```

#### Example 2

```
DRCP> CLEAR LOGGING FILE EVENT 5.* (RET)
```

---

## CLEAR NODE

This command clears node parameters that you previously defined with the SET NODE command.

### Format

CLEAR NODE *node-id* { ALL  
DTEADDRESS  
INBOUND TYPE  
NAME  
RECEIVE PASSWORD  
TRANSMIT PASSWORD }

or

CLEAR KNOWN NODES { ALL  
DTEADDRESS  
INBOUND TYPE  
NAME  
RECEIVE PASSWORD  
TRANSMIT PASSWORD }

where

**ALL**

clears the node name and all its other current parameters.

**DTEADDRESS**

clears the telephone number.

**INBOUND TYPE**

clears the INBOUND TYPE.

*node-id*

is the DECnet node name (if you defined one) or DECnet node address of the node you want to clear or the node for which you want to clear parameters.

**NAME**

clears a DECnet node name you previously defined for a specific DECnet node address.

## CLEAR NODE

### KNOWN NODES

clears the kind of information you specify for all nodes. You must specify the information you want cleared: ALL, DTEADDRESS, INBOUND TYPE, NAME, RECEIVE PASSWORD, or TRANSMIT PASSWORD.

### NOTE

In this version of DRCP, KNOWN NODES works differently from the previous software release.

### RECEIVE PASSWORD

clears the receive password.

### TRANSMIT PASSWORD

clears the transmit password.

### Example 1

The following command clears node name RAVEN, with DECnet node address 55.22, from the router's database. The router now recognizes this node only as node 55.22.

```
DRCP> CLEAR NODE RAVEN NAME (RET)
```

### Example 2

```
DRCP> CLEAR NODE CROW RECEIVE PASSWORD TRANSMIT PASSWORD (RET)
```

### Example 3

The following command clears all the defined node names from the database. The router still knows each of these nodes by its DECnet node address. If you defined any other node characteristics, they are still valid.

```
DRCP> CLEAR KNOWN NODES NAME (RET)
```

---

## CLOSE

This command closes an open software image file and keeps DRCP running so that you can open another file. If you opened the file for read only, the CLOSE command does not save any changes you may have made; otherwise, CLOSE saves all updates.

Use the /WRITE switch if, after opening the file for read only, you change values that you want to save. This switch overrides the read-only status, retaining the new values when you close the file (same save function as EXIT).

Use the /NOWRITE switch if you opened the file for writing changes but you now want to disregard those changes (same no-save function as QUIT).

### Format

```
CLOSE [ /NOWRITE ]  
      [ /WRITE   ]
```

### Example

The following command closes the software image file named RTRDOVE.SYS.

```
DRCP> CLOSE (RET)  
%DRCP-I-WRITEPARMS, writing network software parameters  
%DRCP-I-CLOSE, software image RTRDOVE.SYS closed successfully  
DRCP>
```



---

## CREATE COMMAND-FILE

This command creates a command file that contains DRCP SET commands. In the command file, the values for each parameter are set to all the current values.

If you open a file, make parameter changes, and then create the command file, it includes these latest values.

The command file is useful in two situations:

- If you generate the file after making parameter changes, it becomes a record of your modifications. You can use it to restore automatically your customized software image should it get corrupted or be mistakenly deleted.
- If you generate a command file before you begin to customize your software image, the command file becomes a handy record of all the router's default values.

### Format

```
CREATE COMMAND-FILE filename
```

where

*filename* specifies the name of the command file.

### Example

The following VAX/VMS example creates a command file named CHANGE\_IMAGE.COM. The command file is created after many SET commands customize the software image of a router named DOVE, so that this file can automatically duplicate, if necessary, all the changes. The status message indicates that the command file was created successfully.

```
DRCP> OPEN RTRDOVE.SYS (RET)
%DRCP-I-OPEN, software image RTRDOVE.SYS opened successfully
DRCP> SET ... (RET)
.
.
.
DRCP> SET ... (RET)
DRCP> CREATE COMMAND-FILE CHANGE_IMAGE.COM (RET)
%DRCP-I-CREATE, command file CHANGE_IMAGE.COM created successfully
DRCP>
```

---

## EXIT

This command exits DRCP and returns you to the system prompt. If a software image file is open, EXIT closes the file in the same manner as the CLOSE command:

- If you issued OPEN, EXIT saves all your changed values since you opened the file.
- If you issued OPEN/READ, EXIT disregards any changes you made.

### Format

EXIT

### Example

The following example on a VAX/VMS system exits DRCP when there is an open file named RTRCHICK.SYS:

```
DRCP> EXIT (RET)
%DRCP-I-WRITEPARMS, writing network software parameters
%DRCP-I-CLOSE, software image RTRCHICK.SYS closed successfully
$
```

---

## HELP

This command provides on-line information about using DRCP.

### Format

HELP [*command*]

### Format Notes

1. Typing HELP displays the commands and topics for which information is available.
2. Typing HELP plus a specific command displays information about that command.

### Example 1

```
DRCP> HELP (RET)
```

Information available:

```
Autoprompt CLEAR   CLOSE   CREATE  EXIT
HELP        OPEN    QUIT    SET     SHOW
```

Topic?

### Example 2

```
DRCP> HELP SET (RET)
```

SET

Use the SET command to change network system parameters. The SET command can be issued to modify circuit, line, node, executor and logging characteristics.

Additional information available:

```
CIRCUIT  EXECUTOR  LINE  LOGGING  LOG-FILE  NODE  VERIFY
```

Set subtopic?

---

## OPEN

This command opens the DECrouter 200 software image file you specify. You must open an image file before you can display its information with DRCP SHOW commands or customize it with DRCP SET commands. You can open only one image file at a time.

Use the /READ switch to open the file for read only. You can use this switch to protect the image from any mistakes you might make since these changes are not saved. If you change your mind and decide to retain all your changes, you can override the read-only status with the CLOSE/WRITE command.

### NOTE

If you open the file without the read-only switch and then decide you want to cancel your changes, issue either the CLOSE/NOWRITE command or the QUIT command.

### Format

OPEN[/READ] *filename*

where

*filename* is the name of the file you want to open.

### Example 1

The following command opens router RAVEN's software image file RTRRAVEN.SYS.

```
DRCP> OPEN RTRRAVEN.SYS (RET)
%DRCP-I-OPEN, software image RTRRAVEN.SYS opened successfully
```

### Example 2

The following command opens router CROW's software image file RTRCROW.SYS for read only.

```
DRCP> OPEN/READ RTRCROW.SYS (RET)
%DRCP-I-OPEN, software image RTRCROW.SYS opened successfully
```

---

## QUIT

This command aborts your DRCP session. If a software image file is open, DRCP closes the file without saving the changes you made since you last opened it.

### Format

QUIT

### Example

```
DRCP> QUIT (RET)
```

---

## SET CIRCUIT

This command defines and changes circuit parameters for the router's eight asynchronous circuits and its Ethernet circuit.

### Format

```
SET CIRCUIT ASYNC-n { COST n
HELLO TIMER seconds
STATE { ON
      { OFF
      { MONITOR
VERIFICATION { DISABLED
              { ENABLED
              { INBOUND }
```

or

```
SET CIRCUIT ETHER-1 { COST n
HELLO TIMER seconds
ROUTING PRIORITY n
STATE { ON
      { OFF }
```

where

### COST

specifies the routing cost of the circuit. Specify an integer in the range of 1 to 25. The default is 1 for the Ethernet circuit and 4 for the asynchronous circuits.

### HELLO TIMER

specifies how often the router sends hello messages to the adjacent nodes on all circuits. Specify the seconds in the range of 3 to 8191. The default is 30.

### ROUTING PRIORITY

specifies the ETHER-1 circuit routing priority. Specify an integer in the range of 1 to 128. The default is 64.

### NOTE

When you type this parameter, DRCP accepts ROUTING PRIORITY, ROUTER PRIORITY, and the standard three-letter abbreviation ROU PRI. The parameter is identical to ROUTER PRIORITY in the operational database.

## SET CIRCUIT

### STATE

specifies the operational state of the circuit.

### CAUTION

Be sure to specify ON for at least one of the router's circuits (the default). If the circuits are all OFF, your router will be completely inaccessible after you initiate a down-line load and you will not be able to use the NCP SET CIRCUIT command to turn the circuits ON.

In this case, the only solution is to modify the permanent database again, setting at least one circuit ON (the default) and then down-line loading again.

Specify one of these states:

- ON

Allows traffic over the circuit. This is the normal operational state allowing for complete route-through functions.

- OFF

Prevents traffic over the circuit. The circuit is unavailable for network activity.

- MONITOR

Applies only to asynchronous circuit ASYNC-1. Allows a terminal connected to circuit ASYNC-1 (port J1) to support the Local Monitor (see Volume I, Section 7.3).

### NOTE

If you issue SET CIRCUIT for an asynchronous circuit other than ASYNC-1, specify STATE MONITOR, and then press the RETURN key, DRCP prompts you for a value (ON, OFF, MONITOR) but only ON and OFF are valid for a circuit other than ASYNC-1. Typing MONITOR results in an error message.

Valid values – asynchronous circuits: ON, OFF

– Ethernet circuit: ON, OFF

– ASYNC-1 circuit: ON, OFF, MONITOR

The default for the asynchronous circuits is OFF. The default for the Ethernet circuit is ON.

## VERIFICATION

determines whether the router checks the receive password (defined with the SET NODE command) for an adjacent node that is requesting access. This checking is for adjacent nodes on the specified circuit.

If you specify password checking with ENABLED, the requesting node must supply a password that matches the receive password you defined for this node. If it does not supply the identical password, the router rejects the connection request.

If you specify password checking with INBOUND, a remote node must send a routing verification message before your router sends a verification message. Note that only one of the two nodes establishing the connection can have VERIFICATION set to INBOUND on the circuit at one time.

Specify one of these: ENABLED, DISABLED, INBOUND. The default is DISABLED.

### Example 1

To set circuit ASYNC-4's routing cost to 2 and its hello timer to 20, issue:

```
DRCP> SET CIRCUIT ASYNC-4 COST 2 HELLO TIMER 20 (RET)
```

### Example 2

To set password checking by enabling verification for all the asynchronous circuits, issue:

```
DRCP> SET CIRCUIT ASYNC-* VERIFICATION ENABLED (RET)
```

### Example 3

This example assumes that you want to use all your router's circuits, including circuit ASYNC-1 for the Local Monitor. To turn on all the asynchronous circuits and set the state to MONITOR for ASYNC-1 so that you can attach a terminal to port J1 and run the Local Monitor, issue the following commands:

```
DRCP> SET CIRCUIT ASYNC-* STATE ON (RET)  
DRCP> SET CIRCUIT ASYNC-1 STATE MONITOR (RET)
```

### Example 4

To assign a cost of 1 to all the router's circuits except ASYNC-4, to which you want to assign cost 2, issue:

```
DRCP> SET CIRCUIT ASYNC-* COST 1 (RET)  
DRCP> SET CIRCUIT ASYNC-4 COST 2 (RET)
```

### Example 5

To change the ROUTING PRIORITY to 127 for the Ethernet circuit, issue:

```
DRCP> SET CIRCUIT ETHER-1 ROUTING PRIORITY 127 (RET)
```



---

## SET EXECUTOR

This command defines and changes the router's executor parameters.

### Format

```
SET EXECUTOR { BROADCAST ROUTING TIMER seconds
               BUFFER SIZE bytes
               LOGGING HOST { DECnet-node-id
                             $HOST
               }
               MAXIMUM ADDRESS n
               MAXIMUM BROADCAST NONROUTERS n
               MAXIMUM BROADCAST ROUTERS n
               MAXIMUM COST n
               MAXIMUM HOPS n
               NONPRIVILEGED PASSWORD nonpriv-password
               PATHSPLITS n
               PRIVILEGED PASSWORD priv-password }
```

where

### BROADCAST ROUTING TIMER

determines the intervals at which routing messages are transmitted. (This parameter affects only routing messages that do not involve configuration changes.)

Specify the seconds in the range of 5 to 120. The default is 30 seconds.

### BUFFER SIZE

specifies the size for buffers used by the router for intermediate storage of user data being received and forwarded to adjacent nodes. The buffer size is used for all lines.

### CAUTION

All nodes in the network should have the same buffer size.

Specify the bytes as an integer in the range of 246 to 1482. The default is 576.

### LOGGING HOST

assigns a particular DECnet node to receive DECnet event messages generated by the router.

Specify either the DECnet node name or DECnet node address of a DECnet node that supports event logging.

If you change logging hosts and then wish to reestablish the load host as the logging host (the default), you can specify the load host node in one of two ways:

- Specify the load host's *node-id* in the usual way.
- Specify the symbolic name \$HOST.

When the router is running, the default logging host is the last load host that performed a down-line load.

### MAXIMUM ADDRESS

specifies the router's highest reachable address. Specify an integer in the range of 2 to 1023. The default is 1023.

### MAXIMUM BROADCAST NONROUTERS

specifies the maximum number of Ethernet end nodes that the router's operational database can contain at one time. A **broadcast nonrouter** is an Ethernet end node.

Specify an integer in the range 0 to 1022. The default is 1022.

### MAXIMUM BROADCAST ROUTERS

specifies the maximum number of other Ethernet routing nodes that the router's operational database can contain at one time. A **broadcast router** is an Ethernet routing node.

Specify an integer in the range of 1 to 32. The default is 32.

### MAXIMUM COST

specifies the maximum total path cost that the router allows for all intra-area hops from itself to another node.

Specify an integer in the range of 2 to 1022. The default is 1022.

### MAXIMUM HOPS

specifies the maximum number of intra-area routing hops that the router allows from itself to reachable nodes.

Specify an integer in the range of 1 to 30. The default is 30.

## SET EXECUTOR

### NONPRIVILEGED PASSWORD

defines a network management nonprivileged password. Defining this password makes issuing nonprivileged NCP commands that display the router's operating parameters a privileged operation.

Specify a password with from 1 to 39 alphanumeric characters (use in conjunction with the privileged password). There is no default.

### PATHSPLITS

specifies the number of circuits over which the router performs path splitting. Specify the number of lines in the range of 1 to 4. The default is 1.

### PRIVILEGED PASSWORD

defines a network management privileged password. Defining this password makes issuing privileged NCP commands that execute at the router a privileged operation.

Specify a password with from 1 to 39 alphanumeric characters. There is no default.

### NOTE

The previous software version allows only one network management password for the router. Command files you created from the previous software version may have this command: SET EXECUTOR PASSWORD. This command automatically converts to SET EXECUTOR PRIVILEGED PASSWORD.

### Examples

The following SET EXECUTOR examples customize several parameters. The example in the SHOW EXECUTOR command description shows these customized parameters displayed.

#### Example 1

To set the maximum address to 500, issue:

```
DRCP> SET EXECUTOR MAXIMUM ADDRESS 500 (RET)
```

#### Example 2

To change the broadcast routing timer to 20 seconds, issue:

```
DRCP> SET EXECUTOR BROADCAST ROUTING TIMER 20 (RET)
```

## SET EXECUTOR

### Example 3

To define the router's privileged password as BIRDY and its nonprivileged password as WORMS, issue:

```
DRCP> SET EXECUTOR PRIV PASSWORD BIRDY NONPRIV PASSWORD WORMS (RET)
```

### Example 4

This example permanently designates node 55.1 as the logging host, regardless of the latest load host. The node name appears on the command line because node 55.1 was previously defined as node NENE with the SET NODE command.

```
DRCP> SET EXECUTOR LOGGING HOST NENE (RET)
```

---

## SET LINE

This command defines and changes line parameters for the router's eight asynchronous lines and its Ethernet line. Use the parameters for the asynchronous lines to set up dial-back security for nodes on these lines.

Note that each line's parameter values must be consistent with the same values for the connected device, either the adjacent node or a modem.

Some of the line parameters relate to the dial-back security feature. These asynchronous line parameters work in conjunction with the DTEADDRESS node parameter (see SET NODE).

### Format Notes

1. You can specify the LINE SPEED parameter by typing either SPEED or LINE SPEED.
2. The valid values for MODEM and LINE SPEED depend on the value of CONNECTION TYPE. You must set these parameters to use the dial-back security feature.
3. To set up dial-back for a line, first set CONNECTION TYPE to DIALBACK and then set MODEM, etc.

### Format

```
SET LINE ASYNC-n { CALL ATTEMPTS n
                   CALL SETUP TIMER seconds
                   CONNECTION TYPE { DIALBACK }
                                   { INCOMING }
                   LINE SPEED bps
                   MODEM { CODEX
                          DATA __ LEADS __ ONLY
                          DF03
                          DF112
                          DF224
                          HAYES
                          YES
                   }
                   RECALL TIMER minutes }
```

or

```
SET LINE ETHER-1 SERVICE PASSWORD hex-password
```

where

### CALL ATTEMPTS

specifies the total number of times that the router tries to call a node on a dial-back line if the attempted connection is not successful.

Specify a number in the range of 1 to 25. The default is 3 tries.

#### NOTE

If CONNECTION TYPE is INCOMING, CALL ATTEMPTS is meaningless.

### CALL SETUP TIMER

during a dial-back call, specifies the number of seconds that the router waits for an answer from a remote modem. When this value is exceeded, the router aborts its dial-back attempt.

The default is 60 seconds; the range of valid values is 1 to 300.

#### NOTE

If CONNECTION TYPE is INCOMING, CALL SETUP TIMER is meaningless.

### CONNECTION TYPE

indicates the type of connection that the line supports. The value DIALBACK specifies dial-back security checking. If you are not setting up dial-back security for the node on this line, use the default INCOMING. The other valid value is DIALBACK.

#### NOTE

If you specify DIALBACK, you must also specify a DTEADDRESS for at least one node calling on this line (see SET NODE).

If CONNECTION TYPE is INCOMING, these parameters are meaningless: CALL ATTEMPTS, CALL SETUP TIMER, and RECALL TIMER.

### LINE SPEED

specifies the receive and transmit speed for the line.

#### NOTE

When you modify this parameter, you can type either LINE SPEED or SPEED on the SET LINE command line.

## SET LINE

The setting for this parameter must be consistent with the setting for the connected device, either the adjacent node or a modem. If this parameter is set wrong, the line will not work.

The default is 9600 bps. Specify the speed as one of the following: 300, 600, 1200, 2400, 4800, 9600, or 19200 bps. The valid value depends on CONNECTION TYPE and MODEM:

---

Values of CONNECTION TYPE and MODEM	Valid Values for LINE SPEED
<b>INCOMING</b>	
DATA __LEADS __ONLY	Same as speed of adjacent node on the line
YES	Same as modem's baud rate
<b>DIALBACK</b>	
CODEX	Same as modem's baud rate
DF03	Same as modem's baud rate
DF112	Same as modem's baud rate
DF224	Same as modem's baud rate
HAYES	Same as modem's baud rate

---

### MODEM

indicates whether the line is connected by a modem and, if the CONNECTION TYPE is DIALBACK, the type of modem. To set up dial-back security, select one of these values:

---

Value for MODEM	Use for This Modem
CODEX	Codex 2233 modem
CODEX	Codex 2260 modem
DF03	DF03 Digital modem
DF112	DF112 Digital modem
DF224	DF224 Digital modem (Scholar)
HAYES	Hayes Smartmodem 2400

---

The MODEM parameter has two other possible values:

Value for MODEM	Use
YES	Another modem model is on the line.
DATA__LEADS__ONLY	The line is hard-wired to the node.

The range of valid values depends on the setting for CONNECTION TYPE:

Value of CONNECTION TYPE	Valid Values for MODEM
INCOMING	DATA__LEADS__ONLY YES
DIALBACK	CODEX DF03 DF112 DF224 HAYES

#### RECALL TIMER

specifies the number of minutes between each of the router's attempts to call a node on a dial-back line.

The default is 3 minutes; the range of valid values is 1 to 60.

#### NOTE

If CONNECTION TYPE is INCOMING, RECALL TIMER is meaningless.

#### SERVICE PASSWORD

specifies the DECnet service password that users at load hosts must enter with the NCP LOAD command and users at either load hosts or management hosts must enter with the NCP TRIGGER command.

Specify a password that contains from 1 to 16 hexadecimal digits. The default is 0, which means that the router does not check the DECnet service password (see Volume I, Section 3.5.1.2, for details).



## SET LINE

### Example 1

This example sets up asynchronous line ASYNC-7 for dial-back security. The modem connected to this line is a Digital DF03 modem running at 1200 bps.

```
DRCP> SET LINE ASYNC-7 CONNECTION TYPE DIALBACK (RET)
```

```
%DRCP-I-CONNTYPESET, On line ASYNC-7 CONNECTION TYPE  
has been changed to DIALBACK. It may be necessary  
to change the MODEM and LINE SPEED parameters.
```

```
DRCP> SET LINE ASYNC-7 MODEM DF03 SPEED 1200 (RET)  
DRCP>
```

### Example 2

Example 2 sets up asynchronous line ASYNC-2 for dial-back security with more call attempts than the default of three tries, a higher setting for the call set-up timer than the default of 60 seconds, and a higher setting for the recall timer than the default of 3 minutes.

The CALL ATTEMPTS parameter is set to 8, CALL SETUP TIMER to 90 seconds, CONNECTION TYPE to DIALBACK, MODEM to HAYES, RECALL TIMER to 30 minutes, and LINE SPEED to 2400 bps.

```
DRCP> SET LINE ASYNC-2 CON TYP DIALB MODEM HAYES SPEED 2400 (RET)
```

```
%DRCP-I-CONNTYPESET, On line ASYNC-2 CONNECTION TYPE  
has been changed to DIALBACK. It may be necessary  
to change the MODEM and LINE SPEED parameters.
```

```
DRCP> SET LIN ASYNC-2 CAL ATT 8 CAL SETUP TIM 90 RECAL TIM 30 (RET)  
DRCP>
```

### Example 3

This example prevents unauthorized access to your router by remote maintenance requests such as the NCP LOAD and TRIGGER commands. Here, the password FF44 is defined:

```
DRCP> SET LINE ETHER-1 SERVICE PASSWORD FF44 (RET)
```

---

## SET LOG-FILE

This command creates a log file of all the DRCP commands you enter during a session from the time you issue the command until you exit DRCP. The file includes all messages and autoprompting.

The log file can be especially useful for recording information displayed in response to SHOW commands.

### NOTE

Only one log file can be open at a time. If you open a second log file with SET LOG-FILE when another log file is already open, DRCP automatically closes the open file and creates the new file you specify.

### Format

SET LOG-FILE *filename*

where

*filename* is the name of the log file you want created.

### Format Note

To abbreviate this command, type at least the first four characters of the keyword LOG-FILE: LOG-

### Example

This example shows the creation of a log file named RTRDOVE.LOG before issuing the SHOW SYSTEM command in order to log all of router DOVE's current parameters. This log file is created on a VAX/VMS load host. After the commands and SHOW SYSTEM display, the example shows the created log file.

```
DRCP> SET LOG-FILE RTRDOVE.LOG (RET)
%DRCP-I-LOGOPEN, Log-file RTRDOVE.LOG opened successfully
DRCP> OPEN RTRDOVE.SYS (RET)
%DRCP-I-OPEN, software image RTRDOVE.SYS opened successfully
DRCP> SHOW SYSTEM (RET)
```

```
DECrouter 200 Executor Characteristics as of Wed Jan 25 12:46:32 1989
```

```
Broadcast Routing Timer      = 30
Buffer Size                   = 576
Logging Host                  = 55.1 (NENE)
.
.
.
```

## SET LOG-FILE

DECrouter 200 Line Characteristics as of Wed Jan 25 12:46:33 1989

```
Line id           = ASYNC-1
Communication Mode = ASYNCHRONOUS
Connection Type   = INCOMING
Modem             = DATA_LEADS_ONLY
Duplex           = FULL
Line Speed       = 9600
Call Attempts    = 3
Call Setup Timer = 60
Recall Timer     = 3
```

DECrouter 200 Line Characteristics as of Wed Jan 25 12:46:35 1989

```
Line id           = ASYNC-2
Communication Mode = ASYNCHRONOUS
Connection Type   = DIALBACK
Modem             = HAYES
Duplex           = FULL
Line Speed       = 2400
Call Attempts    = 8
Call Setup Timer = 90
Recall Timer     = 30
```

.  
.  
.

DECrouter 200 Line Characteristics as of Wed Jan 25 12:46:47 1989

```
Line id           = ETHER-1
Service password = FF44
```

DECrouter 200 Circuit Characteristics as of Wed Jan 25 12:46:50 1989

```
Circuit id       = ASYNC-1
Cost             = 1
Hello Timer      = 15
State           = MONITOR
Verification     = DISABLED
```

DECrouter 200 Circuit Characteristics as of Wed Jan 25 12:46:52 1989

```
Circuit id       = ASYNC-2
Cost             = 1
Hello Timer      = 30
State           = ON
Verification     = ENABLED
```

.  
.  
.

## SET LOG-FILE

DECrouter 200 Circuit Characteristics as of Wed Jan 25 12:47:05 1989

```
Circuit id      = ETHER-1
Cost            = 1
Hello Timer     = 30
Routing Priority = 64
State          = ON
```

DECrouter 200 Logging Characteristics as of Wed Jan 25 12:47:06 1989

Logging sink type = Console Monitor File

```
Event Layer      Events
Network Management = 0.0, 0.4-0.7, 0.9
```

DECrouter 200 Node List as of Wed Jan 25 12:47:08 1989

55.1 ( NENE )

```
DTEAddress      = T(508)444-1234
Receive password = MYBIRD
Transmit password = CHIRP
Inbound type    = ENDNODE
```

DECrouter 200 Image Characteristics as of Wed Jan 25 12:47:13 1989

```
System image = RTRDOVE.SYS
System image is open for read/write.
Last modified at Wed Jan 25 12:09:59 1989 on node NENE
```

```
DRCP> EXIT (RET)
%DRCP-I-WRITEPARMS, writing network software parameters
%DRCP-I-CLOSE, software image RTRDOVE.SYS closed successfully
%DRCP-I-LOGCLOSE, Log-file RTRDOVE.LOG closed successfully
$ TYPE RTRDOVE.LOG (RET)
DECrouter 200 Log file - Wed Jan 25 12:46:32 1989

DRCP> OPEN RTRDOVE.SYS
%DRCP-I-OPEN, software image RTRDOVE.SYS opened successfully
DRCP> SHOW SYSTEM
```

## SET LOG-FILE

DECrouter 200 Executor Characteristics as of Wed Jan 25 12:46:32 1989

.  
.  
.

DRCP>EXIT (RET)

%DRCP-I-WRITEPARMS, writing network software parameters

%DRCP-I-CLOSE, software image RTRDOVE.SYS closed successfully

DECrouter 200 Log file - Wed Jan 25 12:47:14 1989

\$

---

## SET LOGGING

This command specifies logging sinks where you want DECnet events to be logged: logging console, logging file, logging monitor. The command also lets you specify the kinds of events you want logged.

Events are logged at the logging host you specified with the SET EXECUTOR LOGGING HOST command or at the default logging host. The default logging host is the last load host that performed a down-line load. For more information about logging sinks, such as the name of the logging file, see the logging host's DECnet documentation.

### Format

```
SET LOGGING { CONSOLE  
              EVENT event-number  
              FILE  
              KNOWN EVENTS  
              MONITOR }
```

where

#### CONSOLE

specifies the host's console as the logging sink. By default, logging is enabled at all three sinks.

#### EVENT

identifies the kinds of events you want logged.

Specify event numbers in the form *class.type*. For example, event code 0.3 refers to automatic service events including down-line loads and event code 0.7 refers to aborted service events (DECnet event logging codes are listed in Volume I, Appendix B).

The default is all possible DECnet events, namely KNOWN EVENTS (see KNOWN EVENTS).

#### FILE

specifies the host's DECnet event logging file as the logging sink. By default, logging is enabled at all three sinks.

## SET LOGGING

### KNOWN EVENTS

refers to all possible DECnet events:

Event Layer	Events
Network Management	= 0.0, 0.4-0.7, 0.9
Session Control	= 2.0-1
End Communication	= 3.1-2
Routing	= 4.0-6, 4.8-12, 4.14-16, 4.18
Data Link	= 5.3-4, 5.14-15
Physical Link	= 6.0, 6.2

### MONITOR

specifies the host's monitor as the logging sink. By default, logging is enabled at all three sinks.

### Example

This example sets up event logging at the console of the logging host for all valid class 5 events.

```
DRCP> SET LOGGING CONSOLE EVENT 5.* (RET)
```

---

## SET NODE

This command defines and changes node parameters for the adjacent nodes connected by the router's asynchronous circuits.

If there are many node names you want to enter, as is likely, it is more helpful to use an automated procedure rather than the SET NODE command to define node names (see Section 1.10).

The DTEADDRESS parameter is required if you want to set up the dial-back security feature. DTEADDRESS works in conjunction with the line parameters for the line to which the node is connected (see SET LINE).

Note that the operating router recognizes all nodes by their DECnet node addresses. Specifying associated DECnet node names is not necessary. Define node names only if you find it more convenient to specify nodes by name rather than by address when you issue commands.

Whether you specify nodes by name or address, the other node parameters provide important access security.

### Format

```
SET NODE node-id { DTEADDRESS dialing-string
                   INBOUND TYPE { ENDNODE
                                 { ROUTER }
                   NAME DECnet-node-name
                   RECEIVE PASSWORD password
                   TRANSMIT PASSWORD password }
```

where

### DTEADDRESS

specifies the node's telephone number plus special characters. Type the *dialing-string* in the format required by the modem on the line to which the node is connected (see Volume I, Appendix C, for details). The *dialing-string* includes:

- The actual telephone number
- Control characters required by the modem
- Optional characters you can use to make your input more readable



## SET NODE

Table 2-2 shows the valid characters for the *dialing-string*.

**Table 2-2: DTEADDRESS Node Parameter: Valid Characters**

Character	Description	
0 through 9 # * - ( )	The actual telephone number with optional characters	
=		Specifies a pause. (Most modems have a default pause that is used to allow switching between phone systems.)
P		Specifies pulse dialing
T		Specifies tone dialing
W		Specifies a wait of a defined length of time for a second dial tone

You can define a DTEADDRESS for as many as 100 nodes. Specify a string of from 1 to 30 valid ASCII characters; there is no default.

### NOTE

This parameter is related to the CONNECTION TYPE line parameter. If you specify a DTE address in order to establish dial-back security, you must set the CONNECTION TYPE line parameter to DIALBACK (see SET LINE).

### INBOUND TYPE

specifies a type identifier for the node. The router requires this identifier from the node in the routing initialization message before the router establishes a connection. This parameter is most useful for nodes on dial-in circuits. You can define inbound type for 100 nodes.

Specify ENDNODE or ROUTER. There is no default.

### NAME

is the DECnet node name for the node.

Node names are not necessary for the DECrouter 200's routing function. On the routing level, the router recognizes remote nodes solely by their DECnet node address.

However, names are convenient. You can specify them instead of DECnet node addresses when you issue further DRCP SET NODE commands and the DRCP SHOW NODE and CLEAR NODE commands. If you define a NAME for a node, you can also specify this name with network management NCP commands that require node IDs, such as the NCP SHOW NODE command.

Specify a string of 1 to 6 alphanumeric characters. At least one character must be a letter. You can enter up to 1,023 node names in the database. No node names are defined by default.

### *node-id*

identifies the DECnet node name or DECnet node address of the node. When you set any parameter other than NAME or you redefine a NAME, you can enter either the *node-name* or the *node-address* as the *node-id*. However, if you are defining, for the first time, a NAME for a node, identify the node only by its DECnet node address.

Specify the address as *area.node-number*. Specify the unique node name with a string of from 1 to 6 alphanumeric characters. At least one character must be a letter.

### RECEIVE PASSWORD

specifies a password that the router uses to control access from an adjacent node connected by one of the asynchronous circuits.

If you enable access verification for a circuit (see the SET CIRCUIT command), the connected adjacent node cannot access the router without first supplying a password that matches the router's receive password. When the router verifies the password, the link becomes operational — the circuit state changes from ON-STARTING to ON.

Specify a string of from 1 to 8 alphanumeric characters. You can define as many as 100 receive passwords. There is no default receive password. (Access VERIFICATION is DISABLED by default.)

## SET NODE

### TRANSMIT PASSWORD

specifies a password that the router must supply to the adjacent node to gain access to that node. The transmit password must match the adjacent node's receive password or access is denied.

If the adjacent node has not set up a receive password, you do not have to specify a transmit password for the circuit.

Specify a string of from 1 to 8 alphanumeric characters. You can define as many as 100 transmit passwords. There is no default transmit password.

#### Example 1

To define node name DODO for node 55.250 and name FINCH for node 55.251, issue:

```
DRCP> SET NODE 55.250 NAME DODO (RET)
DRCP> SET NODE 55.251 NAME FINCH (RET)
```

#### Example 2

This example defines the receive password NONFLYER and the transmit password EXTINCT for adjacent node DODO.

```
DRCP> SET NODE DODO RECEIVE PASSWORD NONFLYER TRANSMIT PAS EXTINCT (RET)
```

#### Example 3

The following commands define node DODO as a network end node and node FINCH as a router.

```
DRCP> SET NODE DODO INBOUND TYPE ENDNODE (RET)
DRCP> SET NODE FINCH INBOUND TYPE ROUTER (RET)
```

#### Example 4

This example defines node DODO's DTEADDRESS as part of setting up a dial-back security. The phone number of node DODO is (617) 555-5566 and requires tone dialing. In addition, the router is at a phone that requires dialing "9" to dial out of its facility.

```
DRCP> SET NODE DODO DTEADDRESS T-9=(617)555-5566 (RET)
```

---

## SET VERIFY/NOVERIFY

The SET VERIFY command enables the display of the commands in a DRCP command file as they execute. Issue SET VERIFY before you run the command file.

The SET NOVERIFY command disables this display.

### Format

SET VERIFY

or

SET NOVERIFY

### Example

DRCP>SET VERIFY (RET)

---

## SHOW CIRCUIT

This command displays circuit parameters in the router's permanent database.

### Format

SHOW CIRCUIT *circuit-id*

or

SHOW KNOWN CIRCUITS

where

*circuit-id*

identifies the circuit for which you want to display parameters.

KNOWN CIRCUITS

displays circuit parameters of all the circuits.

### Examples

Figure 2-1 shows a typical display of asynchronous circuit parameters. Circuit ASYNC-1 is set up for the Local Monitor, ASYNC-2 has all default values, and ASYNC-8 is turned on for communications with VERIFICATION enabled for receive password checking.

---

```
DRCP> SHOW CIRCUIT ASYNC-1 (RET)
```

```
DECrouter 200 Circuit Characteristics as of Sat Jan 28 12:08:20 1989
```

```
Circuit id      = ASYNC-1  
Cost            = 1  
Hello Timer    = 15  
State          = MONITOR  
Verification    = DISABLED
```

---

(Continued)

**Figure 2-1: DRCP SHOW CIRCUIT Display for an Asynchronous Circuit**

## SHOW CIRCUIT

---

```
DRCP> SHOW CIRCUIT ASYNC-2 (RET)
```

```
DECrouter 200 Circuit Characteristics as of Sat Jan 28 12:08:41 1989
```

```
Circuit id      = ASYNC-2
Cost            = 4
Hello Timer     = 30
State          = OFF
Verification    = DISABLED
```

```
DRCP> SHOW CIRCUIT ASYNC-8 (RET)
```

```
DECrouter 200 Circuit Characteristics as of Sat Jan 28 12:08:55 1989
```

```
Circuit id      = ASYNC-8
Cost            = 1
Hello Timer     = 15
State          = ON
Verification    = ENABLED
```

```
DRCP>
```

---

### Figure 2-1 (Cont.): DRCP SHOW CIRCUIT Display for an Asynchronous Circuit

Figure 2-2 shows a typical display of the Ethernet circuit parameters. Note that the field called "Routing Priority" is the same as the "Router priority" field in the NCP SHOW CIRCUIT ETHER-1 CHARACTERISTICS command (see Volume I, Chapter 9).

---

```
DRCP> SHOW CIRCUIT ETHER-1 (RET)
```

```
DECrouter 200 Circuit Characteristics as of Wed Jan 25 08:14:34 1989
```

```
Circuit-id      = ETHER-1
Cost            = 1
Hello Timer     = 30
State          = ON
Routing Priority = 127
```

```
DRCP>
```

---

### Figure 2-2: DRCP SHOW CIRCUIT Display for the Ethernet Circuit

---

## SHOW EXECUTOR

This command displays executor parameters in the router's permanent database.

### Format

```
SHOW EXECUTOR
```

### Example

Figure 2-3 shows a typical SHOW EXECUTOR display. The customized parameters were set with the commands in Examples 1 through 4 of the SET EXECUTOR command description.

---

```
DRCP> SHOW EXECUTOR (RET)
```

```
DECrouter 200 Executor Characteristics as of Wed Jan 25 15:07:05 1989
```

```
Broadcast Routing Timer      = 20
Buffer Size                  = 576
Logging Host                  = 55.1 (NENE)
Maximum Address               = 500
Maximum Broadcast Routers    = 8
Maximum Broadcast Nonrouters = 1022
Maximum Cost                  = 1022
Maximum Hops                  = 30
Nonprivileged Password       = WORMS
Pathsplits                    = 2
Privileged Password          = BIRDY
```

```
DRCP>
```

---

**Figure 2-3: DRCP SHOW EXECUTOR Display**

---

## SHOW IMAGE

This command displays the following information about the open software image file: the name of the file, its current read/write status, the date it was last modified, and the node on which it was last modified.

### Format

SHOW IMAGE

### Example

Figure 2-4 displays information for the open software image file named RTRROBIN.SYS.

---

```
DRCP> SHOW IMAGE (RET)

DECrouter 200 Image Characteristics as of Sat Jan 28 12:43:01 1989

System image = RTRROBIN.SYS
System image is open for read/write.
Last modified at Sat Jan 28 12:08:59 1989 on node NENE

DRCP>
```

---

**Figure 2-4: DRCP SHOW IMAGE Display**



---

## SHOW LINE

This command displays line parameters in the router's permanent database.

### NOTE

Some of the parameters for the asynchronous lines may be unchangeable or meaningless. For example, if the CONNECTION TYPE is INCOMING, ignore the settings for: CALL ATTEMPTS, CALL SETUP TIMER, and RECALL TIMER. Note that the "duplex" characteristic is not changeable. The router's lines always operate at full duplex.

### Format

SHOW LINE *line-id*

or

SHOW KNOWN LINES

where

*line-id*

identifies the line for which you want to display parameters.

KNOWN LINES

displays line parameters of all the router's lines.

### Examples

Figure 2-5 shows two typical displays of asynchronous line parameters. Line ASYNC-3 has all default values. Line ASYNC-8 is set up for a modem connection with dial-back security. Some of ASYNC-8's parameters were set with the commands in Example 2 of the SET LINE command description.

---

```
DRCP>SHOW LINE ASYNC-3 (RET)
```

```
DECrouter 200 Line Characteristics as of Wed Jan 25 13:09:10 1989
```

```
Line id           = ASYNC-2
Communication Mode = ASYNCHRONOUS
Connection Type   = INCOMING
Modem             = DATA_LEADS_ONLY
Duplex           = FULL
Line Speed       = 9600
Call Attempts    = 3
Call Setup Timer = 60
Recall Timer     = 3
```

```
DRCP>SHOW LINE ASYNC-8 (RET)
```

```
DECrouter 200 Line Characteristics as of Wed Jan 25 13:09:21 1989
```

```
Line id           = ASYNC-8
Communication Mode = ASYNCHRONOUS
Connection Type   = DIALBACK
Modem             = HAYES
Duplex           = FULL
Line Speed       = 2400
Call Attempts    = 8
Call Setup Timer = 90
Recall Timer     = 30
```

```
DRCP>
```

---

## Figure 2-5: DRCP SHOW LINE Display for an Asynchronous Line

Figure 2-6 illustrates a SHOW LINE ETHER-1 display first with a DECnet service password defined and then with no service password.

## SHOW LINE

---

```
DRCP> SET LINE ETHER-1 SERVICE PASSWORD FF44 (RET)
DRCP> SHOW LINE ETHER-1 (RET)
```

DECrouter 200 Line Characteristics as of Wed Jan 25 08:14:34 1989

```
Line-id          = ETHER-1
Service Password = FF44
```

```
DRCP> CLEAR LINE ETHER-1 SERVICE PASSWORD (RET)
DRCP> SHOW LINE ETHER-1 (RET)
```

DECrouter 200 Line Characteristics as of Wed Jan 25 08:14:55 1989

```
Line-id          = ETHER-1
Service Password = No Password
```

```
DRCP>
```

---

**Figure 2-6: DRCP SHOW LINE Display for the Ethernet Line**

---

## SHOW LOGGING

This command displays logging parameters in the router's permanent database.

### Format

```
SHOW LOGGING
```

### Example

Figure 2-7 displays logging information for a router whose software image has all default values.

---

```
DRCP>SHOW LOGGING (RET)
DECrouter 200 Logging Characteristics as of Wed Jan 25 09:31:14 1989
Logging sink type = Console Monitor File
  Event Layer      Events
Network Management = 0.0, 0.4-0.7, 0.9
Session Control   = 2.0-1
End Communication = 3.1-2
Routing           = 4.0-6, 4.8-12, 4.14-16, 4.18
Data Link         = 5.3-4, 5.14-15
Physical Link     = 6.0, 6.2
DRCP>
```

---

**Figure 2-7: DRCP SHOW LOGGING Display**

---

## SHOW NODE

This command displays parameters for remote nodes in the router's permanent database.

For nodes you defined in the database, it displays the DECnet node number and the values for these node characteristics, if you defined them: NAME, DTEADDRESS, RECEIVE PASSWORD, TRANSMIT PASSWORD, and INBOUND TYPE.

### Format

SHOW NODE *node-id*

or

SHOW KNOWN NODES

where

*node-id*

is the DECnet node address or the DECnet node name (only if you defined a NAME) of the node about which you want to see information.

Specify the address as *area.node-number*. Specify the node name as the name you defined for the node with the SET NODE *node-address* NAME command. There is no default.

KNOWN NODES

displays all existing information for nodes defined in the router's database.

### Example

Figure 2-8 shows the command that displays all the defined characteristics of node 55.1 (defined in the database as node DODO).

---

```
DRCP> SHOW NODE DODO (RET)

DECrouter 200 Node List as of Wed Jan 25 08:14:01 1989

55.1 (DODO)

      DTEAddress           = T-9=(617)555-5566
      Receive password     = NONFLYER
      Transmit password    = EXTINCT
      Inbound type         = ENDNODE

DRCP>
```

---

**Figure 2-8: DRCP SHOW NODE Display**

---

## SHOW SYSTEM

This command displays these values in the open DECrouter 200 software image file: executor, line, circuit, logging, nodes, and image parameters. Issuing this command is equivalent to issuing the following set of commands:

1. SHOW EXECUTOR
2. SHOW KNOWN LINES
3. SHOW KNOWN CIRCUITS
4. SHOW LOGGING
5. SHOW KNOWN NODES
6. SHOW IMAGE

The command is useful for verifying all the changes you made with SET commands. For a record of all the current customized parameters, you can direct the output to a log file as well as your terminal (see the SET LOG-FILE command).

### Format

SHOW SYSTEM

### Example

```
DRCP> SHOW SYSTEM (RET)
```



# A

## DRCP Command Syntax

This appendix gives the syntax of each DRCP command. See Chapter 2 for detailed command descriptions. The commands are first divided into functions and then presented in alphabetical order.

This appendix employs the graphic conventions outlined in the Preface.

**Table A-1: DRCP Command Syntax**

---

**Command, Parameters, Values**

---

**HELP Command**

HELP [*topic*]

**File Commands**

CLOSE [ /WRITE  
          /NOWRITE ]

CREATE COMMAND-FILE *filename*

OPEN[ /READ] *filename*

---

(Continued)



**Table A-1 (Cont.): DRCP Command Syntax**

---

**Command, Parameters, Values**

---

**SET Commands**

SET CIRCUIT ASYNC-*n* { COST *n*  
HELLO TIMER *seconds*  
STATE { ON  
OFF  
MONITOR }  
VERIFICATION { **DISABLED**  
ENABLED  
INBOUND } }

SET CIRCUIT ETHER-1 { COST *n*  
HELLO TIMER *seconds*  
ROUTING PRIORITY *n*  
STATE { ON }  
OFF }

SET EXECUTOR { BROADCAST ROUTING TIMER *seconds*  
BUFFER SIZE *bytes*  
LOGGING HOST { *DECnet-node-id*  
\$HOST }  
MAXIMUM ADDRESS *n*  
MAXIMUM BROADCAST NONROUTERS *n*  
MAXIMUM BROADCAST ROUTERS *n*  
MAXIMUM COST *n*  
MAXIMUM HOPS *n*  
NONPRIVILEGED PASSWORD *nonpriv-password*  
PATHSPLITS *n*  
PRIVILEGED PASSWORD *priv-password* }

---

(Continued)

**Table A-1 (Cont.): DRCP Command Syntax**

---

**Command, Parameters, Values**

---

SET LINE ASYNC-*n* { CALL ATTEMPTS *n*  
CALL SETUP TIMER *seconds*  
CONNECTION TYPE { DIALBACK }  
  { INCOMING }  
  
LINE SPEED *bps*  
MODEM { CODEX  
          **DATA \_\_LEADS\_\_ ONLY**  
          DF03  
          DF112  
          DF224  
          HAYES  
          YES  
RECALL TIMER *minutes* }

SET LINE ETHER-1 SERVICE PASSWORD *hex-password*

SET LOG-FILE *filename*

SET LOGGING { CONSOLE  
              EVENT *event-number*  
              FILE  
              KNOWN EVENTS  
              MONITOR }

SET NODE node-id { DTEADDRESS *dialing-string*  
                  INBOUND TYPE { ENDNODE }  
                                  { ROUTER }  
  
                  NAME *DECnet-node-name*  
                  RECEIVE PASSWORD *password*  
                  TRANSMIT PASSWORD *password* }

SET [ VERIFY ]  
      [ NOVERIFY ]

---

(Continued)

**Table A-1 (Cont.): DRCP Command Syntax**

---

**Command, Parameters, Values**

---

**SHOW Commands**

SHOW CIRCUIT ASYNC-*n*  
SHOW CIRCUIT ETHER-1  
SHOW KNOWN CIRCUITS

SHOW EXECUTOR

SHOW IMAGE

SHOW LINE ASYNC-*n*  
SHOW LINE ETHER-1  
SHOW KNOWN LINES

SHOW LOGGING

SHOW NODE *node-id*  
SHOW KNOWN NODES

SHOW SYSTEM

**CLEAR Commands**

CLEAR EXECUTOR { NONPRIVILEGED PASSWORD }  
                                { PRIVILEGED PASSWORD }

CLEAR LINE ETHER-1 SERVICE PASSWORD

CLEAR LOGGING { CONSOLE  
                                EVENT *event-number*  
                                FILE  
                                KNOWN EVENTS  
                                MONITOR }

CLEAR NODE *node-id* { ALL  
                                DTEADDRESS  
                                INBOUND TYPE  
                                NAME  
                                RECEIVE PASSWORD  
                                TRANSMIT PASSWORD }

---

(Continued)

**Table A-1 (Cont.): DRCP Command Syntax**

---

**Command, Parameters, Values**

---

CLEAR KNOWN NODES { ALL  
DTEADDRESS  
INBOUND TYPE  
NAME  
RECEIVE PASSWORD  
TRANSMIT PASSWORD }

**Exit Commands**

EXIT

QUIT

---



# B

## DRCP Error, Warning, and Information Messages

This appendix lists and explains DRCP messages, including error messages, warning messages, and information messages.

- Error messages

Error messages indicate operator errors. If a command you issue has syntax errors or invalid parameter values, or causes system-related error conditions, DRCP outputs an error message.

- Warning messages

Warning messages tell you of conditions that affect the router's operations, including the ability to request down-line loads and perform dial-back security checks.

- Information messages

Information messages provide help with command syntax. For example, if you type an invalid parameter value, DRCP outputs an error message but also displays the range of valid values.

This is a typical information message you see after issuing the CLOSE command:

```
DRCP> CLOSE (RET)
%DRCP-I-WRITEPARMS, writing network software parameters
%DRCP-I-CLOSE, software image RTRDOVE.SYS closed successfully
```

The following example shows a typical error message you get after you misspell a command keyword:

```
DRCP> CLSOE (RET)
%DRCP-E-INVKEY, unrecognized keywords - clsoe
```

Table B-1 shows the format of DRCP messages.

**Table B-1: Format of DRCP Error, Warning, and Information Messages**

Message Type	Format
Error Messages	%DRCP-E- <i>error message text</i>
Warning Messages	%DRCP-W- <i>warning message text</i>
Information Messages	%DRCP-I- <i>information message text</i>

The following sections explain all the DRCP messages. The messages are listed in alphabetical order. Sections B.1 and B.2 on error and warning messages also include a “User Action” portion to help you correct problems.

## B.1 Error Messages

%DRCP-E-CLOSEF, software image *filename* close failed

**Explanation:** DRCP could not close the image file. The load host’s disk may be full or you may not have the necessary privileges to write the file to the disk.

**User Action:** Purge the disk or ask the load host system manager to purge. If necessary, ask the load host system manager to upgrade your write privileges.

%DRCP-E-COMM, command file already open

**Explanation:** A command file is already running. You have a command file nested in another command file, not valid with DRCP command files.

**User Action:** Remove the nested command file.

%DRCP-E-CREATEF, command file *filename* create failed

**Explanation:** DRCP could not create the command file you specified with the CREATE COMMAND-FILE command either because of a privilege violation or insufficient disk space.

**User Action:** Purge the disk or ask the load host system manager to purge. If necessary, ask the load host system manager to upgrade your write privileges.

**%DRCP-E-DTEAddress, DTEaddress *dialing-string***  
contains illegal characters

**Explanation:** With the SET NODE DTEADDRESS command, you specified a dial-back phone number that includes invalid characters or spaces. Only the following characters are valid and no spaces are valid in the DTE-address string:

0 through 9  
#  
\*  
=  
P  
T  
W  
(  
)  
-

**User Action:** Specify the number again, typing only valid characters and no spaces.

**%DRCP-E-ERROR, error occurred, command file aborted**

**Explanation:** The command file you are running contains invalid commands so DRCP aborted it.

**User Action:** Correct the command file (and possibly the image file, if it also has inconsistent settings) so that all commands are valid and all the mutually dependent settings are consistent, in particular, CONNECTION TYPE and MODEM.

**%DRCP-E-FILEOPEN, another software image is currently open**

**Explanation:** You tried to open an image file while another one is open.

**User Action:** Before opening another image file, close the first one. Use the CLOSE command to close the first file.

**%DRCP-E-HELP, no help available on *topic***

**Explanation:** No information is available for the command or topic you specified.

**User Action:** See the appropriate section of the *DECrouter 200 Management Guide* for the information you need. Chapter 2 has all the DRCP command descriptions.



**%DRCP-E-ILLSW, illegal switch - *switch***

**Explanation:** The switch you entered (/READ, /WRITE, or /NOWRITE) is not a valid switch for the command you issued.

**User Action:** Check the spelling. Check that you specified the appropriate switch for the command. Supported command/switch combinations are: OPEN/READ, CLOSE/WRITE, and CLOSE/NOWRITE.

**%DRCP-E-INLINEPARMS, Line ASYNC-*n* parameters are inconsistent.**

**Explanation:** The valid values for the CONNECTION TYPE and MODEM parameters are mutually dependent. You closed the software image file with values for these parameters that are not valid for line ASYNC-*n*.

**User Action:** Do not down-line load the image file because line ASYNC-*n* will not work. Reopen the same image file and, for ASYNC-*n*, check your settings for CONNECTION TYPE and MODEM. Reset them so that the values are valid.

**%DRCP-E-INMODEM, Invalid modem - *modem-type*  
for CONN TYPE *connection type* set on line ASYNC-*n*.**

**Explanation:** The valid values for the MODEM parameter depend on the connection type. You specified a value for MODEM that is not valid with the current value for CONNECTION TYPE.

**User Action:** If the current value for CONNECTION TYPE is what you want, specify another value for modem, one that is valid. If not, change your value for CONNECTION TYPE and then specify the same modem parameter. Here are the valid values for CONNECTION TYPE and MODEM:

---

Value of CONNECTION TYPE	Valid Values for MODEM
INCOMING	DATA__LEADS__ONLY YES
DIALBACK	CODEX DF03 DF112 DF224 HAYES

---

**%DRCP-E-INVID, unrecognized line/circuit id - *line/circuit-id***

**Explanation:** Either the line you specified or the circuit you specified is invalid. For the asynchronous lines and circuits, ASYNC-*n* is valid, where *n* identifies the line or circuit number (1 - 8). For the Ethernet line and circuit, specify ETHER-1.

**User Action:** Check your spelling and typing. Check the name of the specific line or circuit you want to specify.

**%DRCP-E-INVKEY**, unrecognized keywords - *keywords*

**Explanation:** The keywords you typed with your command are not valid.

**User Action:** Check spelling and proper sequence of keywords.

**%DRCP-E-INVMON**, Monitor valid for async-1 only.

**Explanation:** You specified STATE MONITOR for an asynchronous circuit other than ASYNC-1.

STATE MONITOR is valid for only one circuit – the ASYNC-1 circuit. For the other circuits, only ON and OFF are valid values for the STATE parameter.

**User Action:** If you are trying to set up your unit to support the Monitor utility, type SET CIRCUIT ASYNC-1 STATE MONITOR. If you are trying to set the STATE of one of the other asynchronous circuits, specify either ON or OFF.

**%DRCP-E-INVVAL**, unrecognized value - *value*

**Explanation:** The value you typed is not valid for the parameter you specified. You typed an invalid character, for example, an alphabetic character instead of a numerical value, or a nonalphanumeric character.

**User Action:** For valid values, use one of these:

- DRCP's autoprompting for the range of valid values, if the value is numeric (see Section 1.7.2)
- Table 1-1 for a list of DECrouter 200 parameters and their valid values
- Chapter 2 for complete DRCP command descriptions with explanations of parameters and their valid values

**%DRCP-E-MISSKEY**, missing keyword

**Explanation:** You omitted a required keyword from the command line.

**User Action:** Specify all the required keywords for the command. See the complete description of the command in Chapter 2 or see the DRCP command syntax in Appendix A.

**%DRCP-E-NODENAME**, invalid node name - *node-name*

**Explanation:** You incorrectly specified a node name on the SET NODE command line. Node names must consist of from one to six alphanumeric characters, with at least one alphabetic character.

**User Action:** Specify a valid node name.

%DRCP-E-NODENUM, invalid node number - *number*

**Explanation:** The DECnet node address you specified is invalid. You may have typed a number higher than 1023, the valid maximum.

**User Action:** Check the area and node number of the DECnet node address you are trying to specify.

%DRCP-E-NONODE, node *node-id* not found

**Explanation:** The node you specified is not defined in the permanent database.

**User Action:** You may have specified the node name or node address incorrectly. Issue SHOW KNOWN NODES to display a list of all the node names and node addresses in the router's permanent database. Check the correct name or address you are trying to specify.

If you are using SET NODE to enter a node in the database, you must refer to it by its node address until you define a node name. Thereafter, you can set other characteristics for the node by specifying either its name or address.

%DRCP-E-NOROOM. Node characteristics list is full.

**Explanation:** You tried to define characteristics for more than 100 nodes but 100 is the maximum.

**User Action:** If you want to define characteristics for this particular node, make room by deleting defined characteristics for another node.

%DRCP-E-NOROOM, node database is full

**Explanation:** You tried to add a node name to the database but it currently contains 1,023 node names, which is the maximum possible number.

**User Action:** If you want to add this particular node name, make room for it by deleting some other node name.

%DRCP-E-NOTOPEN, software image not open or unrecognized keyword

**Explanation:** You must open a software image file before you can issue SHOW, SET, CLEAR, and CLOSE commands. DRCP displays this message if you issue a SHOW, SET, CLEAR, or CLOSE command with no image file open. If DRCP displays this message after you successfully issued an OPEN command, you incorrectly typed a SHOW, SET, CLEAR, or CLOSE command.

**User Action:** If an image file is not open, first issue the OPEN command to open the file and then issue the command that resulted in this error message. If an image file is already open, check your spelling and then issue the command.

%DRCP-E-OPENF, command file open failed

**Explanation:** Either DRCP could not find the command file you specified or DRCP could not open it because of privilege violation.

**User Action:** Check that the command file is in the server directory. Check that you typed the name of the command file correctly. If you did, check that you have all the privileges required to run DRCP and DRCP command files from the load host you are currently using.

%DRCP-E-OPENF, log file *filename* open failed

**Explanation:** DRCP could not open the log file because you specified an invalid file name for a log file.

**User Action:** Specify a valid file name.

%DRCP-E-OPENF, software image *filename* open failed

**Explanation:** DRCP could not open the image file you specified. One of these situations exists:

- You mistyped the file name.
- The file is in the wrong directory.
- This system is not a load host for your router.
- You do not have the required privileges to access the file.
- Another user has the same image file open.
- A down-line load of this image is in progress.

**User Action:** To check for installed router software and image file names, exit DRCP, run ROUCONFIG, and select the List option from the ROUCONFIG Menu (see Volume I, Section 4.5.1). Also, look at the server directory for the image file you specified.

If the load host, directory, and file name are all correct, check the protection status of the file and directory. As router manager, you should have full access privileges. Speak to the load host system manager about obtaining these privileges, if necessary.

If another user has the same image file open, determine his/her identity to talk about router management responsibilities. It is best for one person to manage the router and be responsible for customizing its software image. If there is a backup manager, ensure that you are both aware of all changes to the router's permanent database and the reasons for the changes.

If a down-line load is in progress, you obviously did not initiate it. Try to determine the reason that the router automatically reinitialized. Perhaps it did so because of a problem that you are about to correct by modifying the software image file.

%DRCP-E-PRMRNG, parameter value out of range

**Explanation:** The numeric parameter value you specified is either too small or too large.

**User Action:** For valid values, use one of these:

- DRCP's autoprompting for the range of valid values (see Section 1.7.2)
- Table 1-1 for a list of DECrouter 200 parameters and their valid values
- Chapter 2 for complete DRCP command descriptions with explanations of parameters and their valid values

%DRCP-E-READF, read parameters failed, image corruption

**Explanation:** The software image file has been corrupted.

**User Action:** Exit DRCP and, if there is a copy on another load host, copy the file. Or, you can run ROUCONFIG to delete the corrupted image file and create a new one. Follow these steps:

1. Exit DRCP.
2. Run ROUCONFIG.
3. Select the Delete option from the ROUCONFIG menu to remove the corrupted image file.
4. Select the Add option from the ROUCONFIG menu.
5. Either customize the new image file from the start or repeat all your previous changes. The second way is very fast if all the SET and CLEAR commands are in a command file, as Digital suggests.

Make the new changes that you were trying to make when you got the error message.

%DRCP-E-STRLNG, string too long - *string*

**Explanation:** The ASCII string you specified is too long.

**User Action:** For valid string lengths, use one of these:

- Table 1-1 for a list of DRCP parameters and their valid values
- Chapter 2 for complete DECrouter 200 command descriptions with explanations of parameters and their valid values

**%DRCP-E-VERSIONSKEW**, DRCP and software image are different versions

**Explanation:** You are using a version of DRCP that is different from the release of the image file you are trying to open, V1.1. Along with this message, DRCP gives you an information message displaying the software version of the DRCP program you are running and then DRCP aborts and returns you to the system prompt.

**User Action:** Ensure that both DRCP and the router software image are from the DECrouter 200 V1.1 software distribution kit.

**%DRCP-E-WRITEF**, write failed while writing network parameters to *filename*

**Explanation:** No room exists on the disk for the new version of the router's software image file.

**User Action:** Purge the disk or ask the load host system manager to purge. Then try again. If the same error occurs, the file may be corrupted. If you determine that file corruption is the problem, exit DRCP and if there is a copy on another load host, you can copy the file. Or, you can use ROUCONFIG to delete the corrupted image file and create a new one. Follow these steps:

1. Exit DRCP.
2. Run ROUCONFIG.
3. Select the Delete option from the ROUCONFIG menu to remove the corrupted image file.
4. Select the Add option from the ROUCONFIG menu.
5. Either customize the new image file from the start or repeat all your previous changes. The second way is very fast if all the SET and CLEAR commands are in a command file, as Digital suggests.

Make the new changes you were trying to make when you got the error message.

## B.2 Warning Messages

**%DRCP-W-CIROFF**, all circuit states are off

**Explanation:** If you turn off one or more of the circuits with the SET CIRCUIT *circuit-id* STATE OFF command, you get this message when you close the software image file.

To perform routing, the router must have the STATE of at least one circuit set to ON.

**User Action:** Reopen the same image file. SET the circuits over which you want to route data, including the Ethernet circuit, to STATE ON.

## B.3 Information Messages

%DRCP-I-CLOSE, software image *filename* closed successfully

**Explanation:** DRCP successfully closed the software image file called *filename* after you executed the CLOSE or EXIT command.

%DRCP-I-CMDCAN, command canceled

**Explanation:** You canceled a command with **CTRL/Z** (with **CTRL/D** for ULTRIX) while you were typing the command line.

%DRCP-I-CONNTYPESET, On line ASYNC-*n* CONNECTION TYPE has been changed to *connection-type*. It's necessary to change the MODEM and LINE SPEED parameters.

**Explanation:** For line ASYNC-*n*, you changed the CONNECTION TYPE, either from INCOMING to DIALBACK or from DIALBACK to INCOMING. DRCP reminds you that the valid values for the MODEM parameter depend on the connection type and that the value for LINE SPEED must be consistent with the device attached to the line:

Value of CONNECTION TYPE	Valid Values for MODEM
INCOMING	DATA __LEADS __ONLY YES
DIALBACK	CODEX DF03 DF112 DF224 HAYES

Value of CONNECTION TYPE and MODEM	Valid Values for LINE SPEED
INCOMING	
DATA __LEADS __ONLY YES	Same as speed of adjacent node on the line Same as modem's baud rate
DIALBACK	
CODEX	Same as modem's baud rate
DF03	Same as modem's baud rate
DF112	Same as modem's baud rate
DF224	Same as modem's baud rate
HAYES	Same as modem's baud rate

Check that the values for MODEM and LINE SPEED are valid for the new connection type you just set.

**%DRCP-I-CREATE**, command file *filename* created successfully

**Explanation:** DRCP successfully created the command file you specified with the CREATE COMMAND-FILE command.

**%DRCP-I-LOGCLOSE**, Log-file *filename* closed successfully

**Explanation:** DRCP successfully closed the log file called *filename* after you executed the CLOSE or EXIT command.

Because only one log file can be open at a time, you can also get this message if you try to open a second file when another log file is already open. DRCP automatically closes the open file and displays the message.

**%DRCP-I-LOGOPEN**, Log-file *filename* opened successfully

**Explanation:** DRCP successfully opened the log file you specified with the SET LOG-FILE command.

**%DRCP-I-OPEN**, software image *filename* opened successfully

**Explanation:** DRCP successfully opened the image file you specified with the OPEN command.

**%DRCP-I-VERSION**, This is DRCP version V1.1

**Explanation:** Displayed with the “%DRCP-E-VERSIONSKEW” error message, this message tells you what version of DRCP you are running.

**%DRCP-I-WRITEPARMS**, writing network software parameters

**Explanation:** You closed a software image file with write status. The current parameter values, including any new values you may have just defined, are being written to a new version of the image file. The load host does not automatically maintain older versions.





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