

DECserver 100 Terminal Server Operations Guide

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The *DECserver 100 Terminal Server Operations Guide* is intended for the server manager. This manual contains the information required to set up, manage, monitor, and troubleshoot the DECserver 100 and its attached terminals.

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Preface

The *DECserver 100 Terminal Server Operations Guide* presents information needed to set up, manage, monitor, and troubleshoot the terminal server. For information about routine operation of the DECserver 100 terminals, refer to the *DECserver 100 Terminal Server User's Pocket Guide*.

Intended Audience

This guide is intended for anyone who is responsible for maintaining and managing a DECserver 100 Terminal Server. In this guide, that person is the server manager.

Structure of This Guide

- Chapter 1 provides an overview of the DECserver 100 and of the server manager's environment.
- Chapter 2 provides in-depth information on using the DECserver 100 commands to set up the server and its terminals.
- Chapter 3 discusses the DECserver 100 commands you use to manage and monitor the server and its terminals.
- Chapter 4 contains a troubleshooting guide for the DECserver 100 and its terminals.
- Chapter 5 contains a complete alphabetical reference of the DECserver 100 commands.
- Appendix A provides a listing and explanation of all DECserver 100 status and error messages.

Other DECserver 100 Terminal Server Documents

- *DECserver 100 Terminal Server Software Installation Guide*
Describes the installation and configuration of the server software.
- *DECserver 100 Terminal Server User's Pocket Guide.*
Summarizes the DECserver 100 terminal user's environment.
- *DECserver 100 Terminal Server Site Preparation/Hardware Installation Guide*
Describes environmental requirements for the DECserver 100 and the installation of the hardware unit.
- *DECserver 100 Terminal Server Identification Card.*
Contains identification information entered by the hardware installers, system managers, and the network manager.
- *LAT Network Manager's Guide*
Discusses the Local Area Transport (LAT) architecture, the LAT Control Program (LCP), and network troubleshooting.

Conventions Used in This Guide

| Convention | Meaning |
|----------------|---|
| dot matrix | Dot matrix indicates examples of system output or user input. System output is in black; user input is in red. |
| UPPERCASE | Uppercase in commands and examples indicates that you should enter the characters as shown (enter either uppercase or lowercase). |
| <i>italics</i> | Italics in commands and examples indicate that either the system supplies or that you should supply a value. |
| [] | Square brackets indicate that the enclosed text is optional. If there is more than one option, you can choose one and only one of the options. Do not type the brackets when you enter the command. |
| { } | Braces indicate that the enclosed text is required and you must choose one and only one of the options. Do not type the braces when you enter the command. |
| KEY | Indicates that you should press the specified key. CTRLX indicates that you should press the CTRL key at the same time as the <i>x</i> key, where <i>x</i> is a letter. Note that unless otherwise specified every command line is terminated by pressing the RET key. |

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

NOTE

Generally you can abbreviate command keywords to the first three characters or the number of characters that make the keyword unique.

The DECserver 100 Environment

The DECserver 100 is a high performance terminal server for use on an Ethernet local area network. It allows up to eight terminal users to access any of a set of computer systems on the Ethernet. The terminal users' response time and throughput is similar to that for terminals directly connected to a computer system. With a DECserver 100, users can switch among several data processing tasks more quickly and more conveniently than they can without a terminal server.

1.1 Local Area Networks and the LAT Architecture

Figure 1-1 shows how the DECserver 100 fits into a computer network called a local area network (LAN). Local area networks serve relatively small areas; ranging, for example, from a section of a building to a college campus. The individual computers on the LAN are called network nodes.

The DECserver 100 and the nodes it communicates with must support the Local Area Transport (LAT) architecture. The LAT architecture manages the sessions that the DECserver 100 establishes between its terminals and network nodes.

Support of the LAT architecture requires that LAT software reside on both the DECserver 100 and on the nodes with which it interacts. The LAT software that resides on the DECserver 100 is called server software. The server software is down-line loaded to the server from one of the nodes on the network. The LAT software residing on the other LAT nodes is the service node software; so called because it resides on nodes that provide services to DECserver 100 terminal users.

To down-line load the server, a system manager first installs the server software on an Ethernet node which supports the Digital Network Architecture (Phase IV). That node is then a load host. When power is applied to the DECserver 100, the load host down-line loads the software over the network to the server. The DECserver 100 INITIALIZE command also generates a down-line load.

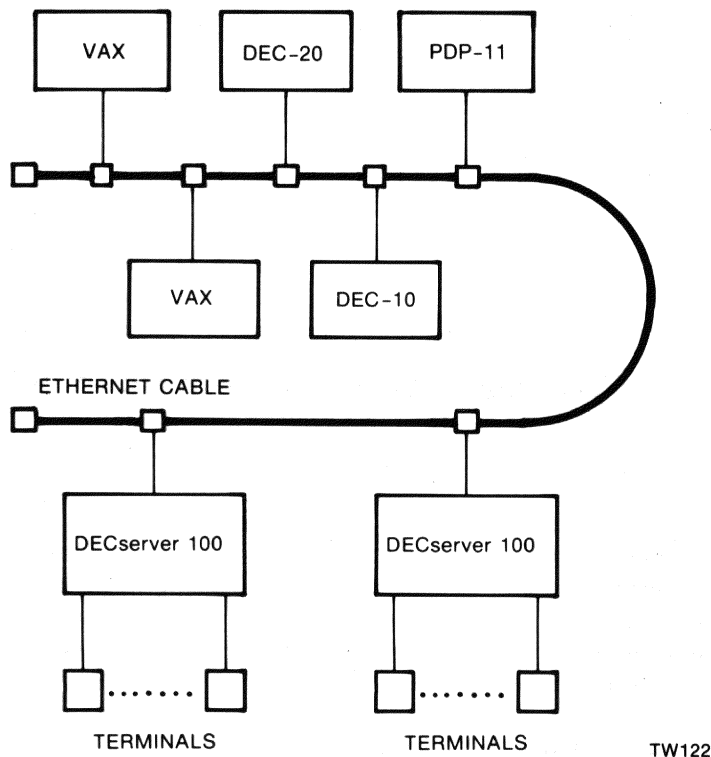


Figure 1-1: Local Area Network (LAN)

System managers can install the server software on a number of load hosts. Digital recommends that the network manager establish a minimum of two load hosts on every LAT network; with at least one load host for every ten DECserver 100 units on larger networks.

1.2 The Server Manager Environment

The server manager is the person responsible for the operation of the DECserver 100 and its terminals. As the server manager, you try to make certain that each terminal user has ready access to the network services he or she requires.

Four broad categories of tasks can be assigned to the server manager:

- Setting up the DECserver 100 and its attached terminals
- Managing the routine operations of the server and its terminals
- Monitoring the status and utilization of the server, terminals, network nodes, and the Ethernet
- Troubleshooting the DECserver 100 and terminals

The rest of this chapter discusses local mode and service mode on the DECserver 100, databases on the DECserver 100, and the terminal user's environment. Chapter 2 discusses initial and subsequent setups of the server and terminals. Chapter 3 covers management and monitoring topics, and Chapter 4 discusses troubleshooting.

1.3 Local Mode and Service Mode

The DECserver 100 provides two modes of operation for the terminal user: local mode and service mode.

1.3.1 Local Mode

In local mode you communicate directly with the DECserver 100. The server software interprets your terminal input directly without transmitting it to a network node. Your terminal entries are commands in the DECserver 100 command set.

There are two kinds of DECserver 100 commands — those intended for the terminal user, and those intended for the server manager.

The commands for the terminal user are nonprivileged because they affect only the user's terminal. The user has nonprivileged status.

Commands for the server manager require privileged status because they can affect the server and all the terminals. To assume privileged status, you need to know the privileged password (see Section 2.1). The password helps ensure that unauthorized persons do not gain access to the privileged commands. Privileged status also gives you access to all the nonprivileged commands.

In local mode, the DECserver 100 issues status and error messages in response to many commands. The messages appear on your terminal. All messages employ a standard format and describe the status or error in a brief comment. Appendix A lists each message with a more detailed explanation.

1.3.2 Service Mode

Service mode is an environment nearly identical to that of a terminal connected directly to a network computer system. All terminal input and output is directed to and from a particular node on the local area network.

Three definitions are useful in discussing service mode:

- Service node – a network computer system to which DECserver 100 terminal users have access.
- Service – a resource offered to DECserver 100 terminal users by one or more service nodes. A service can be equivalent to a service node name or it can represent resources available from one or more service nodes.
- Session – the interaction between a terminal user and a service.

Each terminal user can have up to four sessions in effect at the same time. One session is active and one to three sessions are temporarily inactive. Commands such as BACKWARDS and FORWARDS (issued in local mode) allow the terminal user to switch among sessions.

This multiple session capability allows the terminal user to perform several tasks at once. For example, the user can be editing a report in one session, and then switch to another session to access file data for the report.

1.4 Databases on the DECserver 100

There are two databases defined in DECserver 100 memory: the permanent database, and the operational database. Both contain characteristics for the server and its attached terminals. The server software uses these characteristics to carry out its functions.

When a terminal user logs in, the permanent characteristics for that terminal are copied from the permanent database to the operational database. They then become the terminal's operational characteristics.

When you initialize the server, the permanent server characteristics are copied to the operational database. These characteristics are then the operational characteristics for the server.

The permanent database itself remains unchanged when terminal users log in and when you initialize the server. However, you can change the characteristics in the permanent database with the DEFINE TERMINAL and DEFINE SERVER commands.

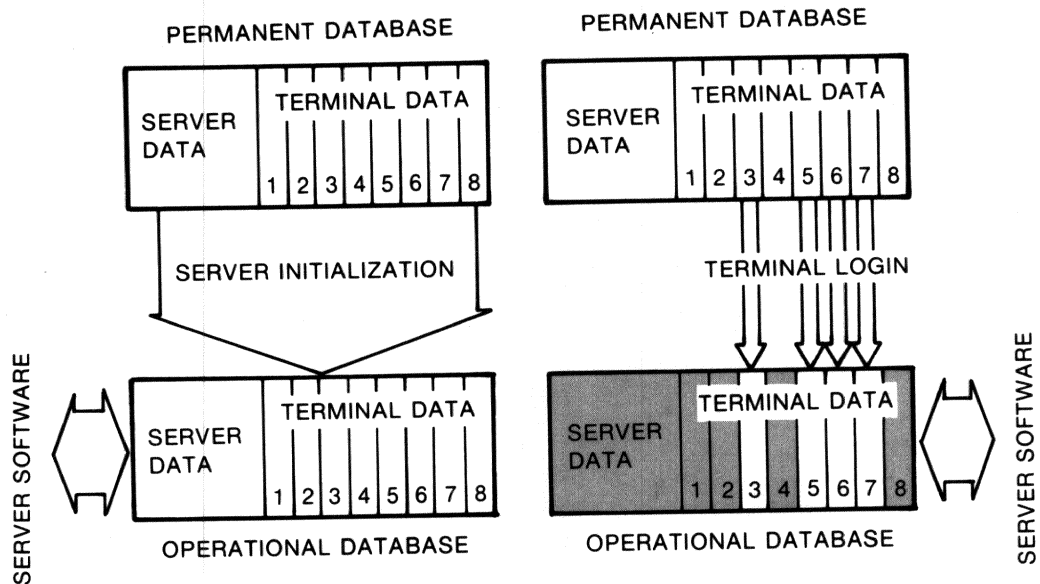
Figure 1-2 shows the relationships among the server software, the permanent database, and the operational database.

When the DECserver 100 arrives at your facility, the permanent database contains the factory specified characteristics for the server and the terminals. They are copied to the operational database when you first install and initialize the server. After modifying the permanent database, you can restore the factory specified values by using the software reset procedure (refer to Section 2.7).

1.5 The Terminal User Environment

Typically, a terminal user spends most of his or her time in service mode using one or more service sessions.

As the server manager, you may also spend a considerable amount of time in service mode. The *DECserver 100 Terminal Server User's Pocket Guide* furnishes details about access to service mode, and about the terminal user's environment.



TW121

Figure 1-2: The Server Software and the DECserver 100 Databases

1. The first part of the document is a list of names and addresses of the members of the committee. The names are listed in alphabetical order, and the addresses are given in full.

2. The second part of the document is a list of the names and addresses of the members of the committee who have been elected to the office of the Secretary. The names are listed in alphabetical order, and the addresses are given in full.

3. The third part of the document is a list of the names and addresses of the members of the committee who have been elected to the office of the Treasurer. The names are listed in alphabetical order, and the addresses are given in full.

4. The fourth part of the document is a list of the names and addresses of the members of the committee who have been elected to the office of the Chairman. The names are listed in alphabetical order, and the addresses are given in full.

5. The fifth part of the document is a list of the names and addresses of the members of the committee who have been elected to the office of the Vice-Chairman. The names are listed in alphabetical order, and the addresses are given in full.

2

Setting Up the DECserver 100 and Its Terminals

This chapter contains the information you need to set up the DECserver 100 and its terminals for routine operation.

Sections 2.2 and 2.3 show you how to set up the login and privileged passwords. Setup for the server and terminal characteristics is covered in Sections 2.4 and 2.5. Sections 2.6 through 2.8 discuss initializing the server, resetting characteristics to factory specifications, and setting up a printer.

When your DECserver 100 is initially installed, the factory specified values are in effect for the terminal characteristics, the server characteristics, and the passwords.

You use the information in this chapter to set up new values for the characteristics and the passwords. Then you initialize the server to make your setups operational.

Subsequent setups for the terminals become operational when each terminal user logs in. Subsequent setups for the server and passwords take effect each time the server is initialized.

2.1 Entering Privileged Status

To begin setup, enter privileged status to gain access to the privileged commands. Type the SET PRIVILEGED command. In response to the Password> prompt, type the privileged password. If your DECserver 100 has just been installed, the factory specified password, "system", is in effect.

```
Local> SET PRIVILEGED
Password> SYSTEM (not echoed)
Local>
```

Your terminal is now the privileged terminal, and you can enter privileged commands at that terminal. You can begin to set up the desired operating parameters for the DECserver 100 and its terminals.

2.2 Setting Up the Privileged Password

Your first task should be to set up a new privileged password. This password helps ensure that unauthorized persons do not gain access to the privileged commands. Use the **DEFINE PRIVILEGED PASSWORD** command. Here is an example using the password A1B2C3:

```
Local> DEFINE PRIVILEGED PASSWORD
Password> A1B2C3 (not echoed)
Verification> A1B2C3 (not echoed)
Local>
```

For security, the password you enter is not echoed on your terminal.

The new password is stored in the permanent database. It becomes operational when you initialize the DECserver 100. If your DECserver 100 is already running and you want to make the new privileged password take effect immediately, refer to Section 3.1.

2.3 Setting Up the Login Password

You can require that any or all of the terminal users enter a password when they log in. This is the login password. If you define the **LOGIN** characteristic as **ENABLED** for a terminal, the login password is required at that terminal (see Section 2.5.5). The factory specified login password is "access". It is recommended that you set up a new password after initial installation of the server and terminals.

To set up the login password, enter the **DEFINE LOGIN PASSWORD** command. Here is an example using the password D4E5F6:

```
Local> DEFINE LOGIN PASSWORD
Password> D4E5F6 (not echoed)
Verification> D4E5F6 (not echoed)
Local>
```

Your new login password is stored in the permanent database. It becomes operational when you initialize the DECserver 100. If you wish to have it take effect immediately, refer to Section 3.1.

2.4 Setting Up the Server Characteristics

You can display the current server characteristics by entering the **SHOW SERVER** command.

```
Local> SHOW SERVER
```

SHOW SERVER lists the characteristics stored in both the permanent and operational databases. Refer to Chapter 5 for a sample of the SHOW SERVER display.

When you set up the server characteristics, you normally want the values you choose for the characteristics to be retained each time you initialize the server. Therefore, you use the DEFINE SERVER command which updates the permanent database.

Following setup, you can change the server characteristics. Use the DEFINE SERVER command to modify the permanent characteristics. These changes become operational when you initialize the server. Use the SET SERVER command to modify the operational characteristics. These changes become operational immediately, but do not stay in effect after initialization.

To set up the server characteristics, specify a value for each with the DEFINE SERVER command. Chapter 5 contains the command description and the syntax for DEFINE SERVER. Table 2-1 lists the server characteristics. Sections 2.4.1 through 2.4.3 describe the server characteristics.

Table 2-1: Server Characteristics

| Characteristic | Function |
|-----------------------|--|
| CIRCUIT TIMER | specifies the interval between server messages on the Ethernet, in milliseconds. |
| CONSOLE | designates one server terminal as the console. |
| DUMP | determines whether up-line dumping occurs. |
| HEARTBEAT | enables or disables collision detect circuitry. |
| KEEPALIVE TIMER | specifies the interval between server messages when no data is transmitted. |
| LOCATION | designates the location of the server. |
| LOGIN LIMIT | limits the number of login attempts. |
| NAME | assigns a server name. |
| NUMBER | specifies a server number. |
| SOFTWARE | specifies the file name of the DECserver 100 software load image. |

2.4.1 Network Operation Characteristics

Three server characteristics affect the operation of the network. More details about these characteristics appear in the *LAT Network Manager's Guide*.

CIRCUIT TIMER

The circuit timer value defines the interval in milliseconds (ms) between messages transmitted from the terminal server to a service node. Your choice of the timer value affects the response time at the terminals attached to the server and also the loading of the service nodes. You should coordinate it with your network manager and the node system managers.

If you choose a low value for CIRCUIT TIMER, the response time for the terminals is decreased, but the demand upon service nodes increases. A long interval minimizes node loading, but extends user response time.

The default for CIRCUIT TIMER is 80 milliseconds. This is the value recommended for interactive terminal use on timesharing systems. It should only be changed after consulting with the network manager. To improve response time, you can reduce the circuit timer value if your network has lightly loaded service nodes. If the network and the service nodes are very heavily used, a longer circuit timer value increases service node performance.

KEEPALIVE TIMER

The value you choose for KEEPALIVE TIMER is less critical for overall performance than the circuit timer value. The keepalive timer defines the interval in seconds between messages in which no data is being transmitted. The server sends status messages on the Ethernet at these intervals. Discuss the keepalive timer choice with your network manager.

The default value for KEEPALIVE TIMER is 20 seconds. This is recommended for normal Ethernet environments. For a heavily loaded Ethernet, you should consider using a value between 20 and the maximum of 180.

HEARTBEAT

Collision detect circuitry senses collisions of messages transmitted on the Ethernet. Heartbeat is a characteristic that indicates the status of the collision detect circuitry at the DECserver 100 transceiver.

For all Digital transceivers, and others supporting collision detect circuitry, the HEARTBEAT characteristic should be enabled for error-free operation. If your transceiver does not support the testing of collision detect circuitry, enter DISABLED for HEARTBEAT. The default is ENABLED.

Discuss the HEARTBEAT characteristic with your network manager.

2.4.2 Loading and Dumping Characteristics

The DUMP and SOFTWARE characteristics affect down-line load and up-line dump operations.

DUMP

If the server software detects a fatal error, it performs a fatal bugcheck and reinitializes. When you define DUMP as ENABLED, you enable up-line dumps of server memory when fatal bugchecks occur. An up-line dump normally goes to the same load host that down-line loaded the server software. If that host is not available, the dump is directed to any available load host on the network.

It is recommended that you support up-line dumping by setting DUMP to its default, ENABLED. If you enter DISABLED, up-line dumping is not performed.

You should inform the system managers for the load hosts if you change the DUMP characteristic.

SOFTWARE

When you initialize the server, the software load image is down-line loaded. The server sends a message to a load host that identifies the image.

The default file name for SOFTWARE is PS0801ENG. Normally you do not modify this file name. However, if you and a host system manager wish to load a different software load image, specify its file name with the SOFTWARE characteristic. The directory for the new file name remains the system load default directory.

2.4.3 Server Administration Characteristics

A number of server characteristics can assist you in server administration.

LOCATION

The server location appears in the SHOW SERVER command, and it can be useful if you have responsibility for a number of servers. The server passes the location to service nodes in its messages. LOCATION is a value of 1 to 16 keyboard characters enclosed in quotation marks. There is no default for LOCATION.

NAME

NAME specifies the server name. The name is useful for identifying the server (it appears in the SHOW SERVER display), and service nodes can use it to identify reachable servers on the Ethernet. You should make sure that NAME matches the DECnet node name given the DECserver 100 when the server software was installed on a load host. See the system manager of the load host.

Service node system managers can display the server name using a network management command.

The server name is a string of 1 to 16 keyboard characters enclosed in quotation marks. The default name is "DECserver 100."

NUMBER

NUMBER specifies a value from 0 to 32767 which you can use in any way to identify a DECserver 100. It appears in the SHOW SERVER display. The default is 0.

CONSOLE

CONSOLE identifies a console terminal. This is one of the terminals attached to the server. A console terminal is necessary for performing server troubleshooting. The console displays status messages for down-line loading, up-line dumping, and bugchecks. The default console terminal is the terminal connected to port 1 at the server hardware unit.

LOGIN LIMIT

LOGIN LIMIT is a tool for enhancing security by restricting access to the terminals and server. When LOGIN is enabled at a terminal, a prospective user is allowed a limited number of attempts to log in. If the user fails to type the correct password, the terminal port disables for a period of one minute. You specify the permitted number of attempts per minute with LOGIN LIMIT. The default value is three attempts per minute. You can enter any number from 0 to 250, or you can enter NOLIMIT. If you specify 0, you disable access to the server for all terminals that have the terminal characteristic LOGIN ENABLED.

2.5 Setting Up the Terminal Characteristics

The terminal characteristics take effect at the terminal's port on the server. When you set up the terminal characteristics, you do not affect the terminal unit itself.

You can list the current terminal characteristics using the SHOW TERMINAL command. This command shows the characteristics which are stored in both the permanent and operational databases.

To display the characteristics for a specific terminal, for example terminal 3, enter the following:

```
Local> SHOW TERMINAL 3
```

To list the characteristics for all the terminals, enter this command:

```
Local> SHOW TERMINAL ALL
```

To set up the characteristics for the terminals, use the DEFINE TERMINAL command. DEFINE TERMINAL modifies the permanent database, and the setup characteristics become operational each time a terminal user logs in.

Following setup, you and the terminal users can modify the permanent characteristics with the DEFINE TERMINAL command, or modify the operational characteristics with the SET TERMINAL command. Certain terminal characteristics require privileged status to be changed.

To set up the terminal characteristics, specify a value for each with the **DEFINE TERMINAL** command. Chapter 5 has the command description and syntax for **DEFINE TERMINAL**. Table 2-2 lists the terminal characteristics. Sections 2.5.1 through 2.5.5 describe the terminal characteristics.

NOTE

Keep a record of the characteristics you define for each terminal. If the DECserver 100 unit should fail, the permanent database may be lost. A record (in a notebook, or a file on a service node) can expedite setting up the terminals on a new DECserver 100.

Table 2-2: Terminal Characteristics

| Characteristic | Function |
|-----------------------|--|
| AUTOBAUD | enables the server to automatically determine the terminal speed, character size, and parity. |
| AUTOCONNECT | enables the server to automatically connect the terminal to a specified service at login or after abnormal service terminations. |
| BACKWARD SWITCH | specifies the keyboard character used to switch to the previous session while in service mode. |
| BROADCAST | enables the receipt of broadcast messages from other terminals. |
| CHARACTER SIZE | specifies the number of data bits in each character exchanged between the terminal and the server. |
| DEDICATED SERVICE | specifies a permanent service for the terminal. |
| FLOW CONTROL | specifies whether the terminal and server can control data flow to and from the terminal. |
| FORWARD SWITCH | specifies the keyboard character used to switch to the next session while in service mode. |
| GROUP CODES | restricts the terminal to specified groups of service nodes. |
| INPUT FLOW CONTROL | specifies whether the server can control data flow from the terminal. |
| INPUT SPEED | specifies the speed for transmissions from the terminal to the server. |
| LOCAL SWITCH | specifies the keyboard character used to enter local mode from service mode. |
| LOGIN | determines whether a password is required for server login. |

(continued on next page)

Table 2-2 (cont.): Terminal Characteristics

| Characteristic | Function |
|-----------------------|--|
| LOSS NOTIFICATION | specifies whether the user is signaled when data characters are lost due to data errors or overruns. |
| MESSAGE CODES | specifies whether 3-digit codes appear with server messages. |
| NAME | specifies the terminal name. |
| OUTPUT FLOW CONTROL | specifies whether the terminal can control data flow from the server. |
| OUTPUT SPEED | specifies the speed for transmissions from the server to the terminal. |
| PARITY | specifies terminal parity. |
| PREFERRED SERVICE | specifies a preferred service for the terminal. |
| SESSION LIMIT | restricts the number of terminal service sessions. |
| SPEED | specifies input and output speed for transmissions between the server and the terminal. |
| TYPE | specifies the terminal type. |
| USERNAME | specifies a login user name. |
| VERIFICATION | determines whether session verification messages appear. |

2.5.1 Session Control Characteristics

You can specify terminal characteristics to assist in coordinating terminal users' access to network services.

SESSION LIMIT

If you wish to limit the number of service sessions for any terminal user, you can modify that terminal's **SESSION LIMIT**. You can set **SESSION LIMIT** to values of 0, 1, 2, 3, or 4. If you enter the value zero, the terminal user cannot establish any sessions with the **CONNECT** command or the autoconnect function. The user is limited to local mode. The default for **SESSION LIMIT** is the maximum value of 4.

DEDICATED SERVICE

The **DEDICATED SERVICE** feature is designed for terminal users who require only one service for an extended period. The server connects the user directly to the dedicated service when he or she presses any key on the terminal.

With a dedicated service, the terminal reacts like a terminal connected directly to a service node, and local mode is not available for the terminal. The user need have no knowledge of the DECserver 100 or its local commands in order to use the terminal.

To enable a dedicated service, VAX, for terminal 2, enter the following:

```
Local> DEFINE TERMINAL 2 DEDICATED SERVICE VAX
Local> LOGOUT TERMINAL 2
```

To disable the dedicated service, VAX, at terminal 2, type the following:

```
Local> DEFINE TERMINAL 2 DEDICATED SERVICE NONE
Local> LOGOUT TERMINAL 2
```

NOTE

You cannot use the SET TERMINAL command to establish a dedicated service for a terminal if that terminal is currently logged in. Use the DEFINE TERMINAL command or wait until the terminal user logs out.

PREFERRED SERVICE

A terminal user may access a particular service often, but still require resources available elsewhere on the Ethernet. If you assign a preferred service to a terminal and enable AUTOCONNECT, the server connects the terminal directly to that service at terminal login (as in the case of a dedicated service). However, with a preferred service, the user can switch to local mode at any time and then make connections to other services.

If you assign a preferred service without AUTOCONNECT enabled, the server does not connect the terminal upon login. However, the CONNECT command can be used without a service name. The server makes the connection to the preferred service.

The default for PREFERRED SERVICE is NONE.

AUTOCONNECT

AUTOCONNECT permits automatic connections to network services, and is recommended for most terminal users.

How the server functions with AUTOCONNECT enabled depends upon whether you also specify PREFERRED SERVICE, DEDICATED SERVICE, or neither.

- With a PREFERRED SERVICE, the server:
 - Connects the terminal to the preferred service at login
 - Automatically attempts to reestablish the current session if the connection for the session fails
 - Connects to the preferred service if the user enters the CONNECT command without a service name.

- With a **DEDICATED SERVICE**, the server:
 - Connects the terminal to that service at login
 - Attempts to reestablish the connection if the service session fails.
- With neither a **PREFERRED SERVICE** nor a **DEDICATED SERVICE** defined, the server attempts to reestablish any service connection that terminates abnormally.

With **AUTOCONNECT**, attempts to reconnect are made at 20 second intervals, and they continue until the user enters local mode. Unless a dedicated service is in effect, a status message appears at the terminal indicating that the server is trying to restart a session. The new connection can be made to any service node that supplies the same service. In a cluster environment, for example, this feature provides automatic fail-over to a working service node in the cluster.

AUTOCONNECT is especially helpful when a user wishes the server to repeat connection attempts to a nonoperational service node. When the node comes up, the server software notifies the user with an audible beep signal and a message. The default for **AUTOCONNECT** is **DISABLED**.

GROUP CODES

GROUP CODES help you define the environment for the DECserver 100 terminals. Each service node and each terminal is assigned one or more group codes. If any group code applies to both a terminal and a service node, then the terminal user is authorized to use that node's services.

You limit the terminal user to certain available services by specifying group codes for the terminal. The terminal user can use services offered only by his or her authorized service nodes. Also, with the **SHOW** commands, the user receives information for the authorized services only.

The network manager normally coordinates the assignment of group codes for the service nodes and servers. The DECserver 100 supports group codes in the range 0 to 127 only. Group codes are discussed further in the *LAT Network Manager's Guide*.

When you enter a code list for **GROUP CODES**, use commas (,) to separate code digits. A hyphen separating two code digits denotes a range of groups. **ENABLED** gives the terminal access to the listed groups; **DISABLED** denies access. For example, with the following **DEFINE TERMINAL** command, access to groups 1, 3, and 5 through 8 is added to any previously defined group access.

```
Local> DEFINE TERMINAL GROUP CODES 1,3, 5-8 ENABLED
```

The default is **GROUP CODE 0 ENABLED**. When all terminals and service nodes implement this default, each terminal has access to all services on the Ethernet.

2.5.2 Terminal Data Characteristics

A number of terminal characteristics determine the make-up of the data transmitted between the terminal and server.

AUTOBAUD

AUTOBAUD is a means by which the server, at terminal login, automatically senses the terminal's speed, parity, and character size. The server then adjusts its terminal port characteristics accordingly.

For AUTOBAUD to function correctly, the terminal's internal parameters must be set as follows:

- The terminal's input speed and output speed must be the same. The permissible speed values are listed in the DEFINE TERMINAL command description in Chapter 5.
- The terminal must have one of the following character size and parity combinations: CHARACTER SIZE 8 and PARITY NONE, or CHARACTER SIZE 7 and PARITY EVEN.

These are the default parameters for all terminals in the Digital VT series. Consult the terminal operator's guide if necessary.

If you wish to operate the terminal with different input and output speeds, or with other combinations of character size and parity, set up AUTOBAUD to DISABLED. Then define speed, character size, and parity as discussed in the following sections. By default AUTOBAUD is enabled.

SPEED, INPUT SPEED, OUTPUT SPEED

If you do not enable AUTOBAUD, you must define a terminal speed characteristic. The input and output speeds of a terminal are expressed in bits per second (bps). The permissible speed values are listed in the DEFINE TERMINAL command description in Chapter 5. Normally, all you need to specify is a value for SPEED. Enter values for INPUT SPEED and OUTPUT SPEED only if the two are different.

The default value for the speed characteristics is 9600 bps.

CHARACTER SIZE

Each character that is transmitted from terminal to server is made up of 7 or 8 data bits. Server software automatically formats the characters for transmission from the server to the service node. Define CHARACTER SIZE as 7 if a terminal only supports 7-bit operation; otherwise define it as 8. The operator's guide for the terminal you are using can assist you in determining character size. The default value is 8.

If you have AUTOBAUD enabled, the server automatically sets the character size.

PARITY

PARITY provides a means for the DECserver 100 to check terminal characters for transmission errors. If a terminal supports PARITY, the parity can be ODD or EVEN. If parity is not supported on a terminal, enter the default NONE. With AUTOBAUD enabled, the server sets terminal parity automatically.

NOTE

The DECserver 100 does not support terminals using mark or space parity. Older Digital terminals, such as the LA36, may require setting up with jumpers to operate with the server. Refer to the terminal operator's guide for details.

2.5.3 Flow Control Characteristics

If terminal data is exchanged at high speeds, memory space set aside to store messages prior to processing can become temporarily full. Data is lost if it arrives when this memory is full. Flow control inhibits transmissions between the terminals and server to prevent this loss.

FLOW CONTROL, INPUT FLOW CONTROL, OUTPUT FLOW CONTROL

INPUT FLOW CONTROL applies to data incoming at the server from the terminal. OUTPUT FLOW CONTROL applies to data outgoing from the server to the terminal.

Set FLOW CONTROL to ENABLED for normal applications for terminals that support XOFF and XON flow control characters. (Refer to the operator's guide for the terminals.) Set FLOW CONTROL to DISABLED for terminals that do not support XOFF/XON flow control and for personal computer file transfers.

INPUT FLOW CONTROL and OUTPUT FLOW CONTROL provide the flexibility for controlling transmissions in one direction only. The default for flow control is ENABLED in both directions.

LOSS NOTIFICATION

You can enable LOSS NOTIFICATION at each terminal. LOSS NOTIFICATION functions when a character is lost because of parity errors, framing errors, data overruns, or other reasons. The server transmits a BEL character (an audible beeping sound) to the terminal. This signals the terminal user that characters are lost so that he or she can reenter them. The default is ENABLED.

2.5.4 Switch Characteristics

Several terminal characteristics allow the terminal user to switch between local and service modes, and between service sessions.

LOCAL SWITCH

The local switch character can be used to enter local mode from service mode. You can set up any keyboard character as the local switch, but an unused control character is recommended. The default is NONE. (The **BREAK** key can always be used to enter local mode from service mode.)

FORWARD SWITCH, BACKWARD SWITCH

The characters you specify in FORWARD SWITCH and BACKWARD SWITCH allow the user, in service mode, to transfer between two service sessions. The FORWARD SWITCH character activates the "next" session. This is the second session from the top in the SHOW SESSIONS display. The BACKWARD SWITCH character activates the "previous" session; the session at the bottom of the SHOW SESSIONS list. If there are only two sessions in effect, both characters restart the noncurrent session.

Choose separate characters for each of the switches. Do not select characters that the terminal user is likely to enter routinely while using a service. The user interrupts the current session when he or she presses a switch character. Undefined control characters such as **CTRL/A** are recommended for these switch characteristics.

The default for these switch characters is NONE.

2.5.5 Terminal Administration Characteristics

A number of terminal characteristics affect the day-to-day administration of a terminal.

LOGIN

LOGIN is an important security tool. This characteristic is a privileged command parameter. It permits you to require that a terminal user enter a password to gain access to server functions. LOGIN ENABLED permits access only with a password. LOGIN DISABLED permits access without a password. You specify the password using the DEFINE LOGIN PASSWORD command (see Section 2.3). LOGIN is disabled by default to simplify DECserver 100 installation. It should be enabled for normal use in environments where security is important.

USERNAME

Each terminal user normally enters a user name at login. His or her user name is any string of 1 to 12 keyboard characters. Alternatively, you can specify it with the USERNAME terminal characteristic. The default for USERNAME is the value for the terminal NAME characteristic.

A terminal user can, for convenience, enter **CTRL/Z** after the user name prompt at login. His or her user name then defaults to the value for the terminal's NAME characteristic.

NOTE

You can specify a user name only with the SET TERMINAL command. The user name is not a part of the permanent database and cannot be specified using the DEFINE TERMINAL command.

TYPE

There are four terminal types, and each functions differently while in local mode.

- **HARDCOPY** – for use with paper-output terminals. The delete key echoes deleted characters between backslashes (\). The Digital LA120 is an example of a hardcopy terminal.
- **SOFTCOPY** – for use with video terminals. The delete key erases deleted characters from the screen, and moves the cursor one character to the left. All server displays build upward line-by-line from the bottom of the screen. The Digital VT52, for example, is a softcopy terminal.
- **ANSI** – for use with video terminals supporting ANSI escape sequences. The delete key functions as in SOFTCOPY terminals. However, the screen clears before all terminal displays, and the displays build downward line-by-line from the top of the screen. Terminals in the Digital VT100 and VT200 series can be set up as type ANSI.
- **OTHER** – for use with noninteractive terminals (for example, output-only printers). DECserver 100 commands cannot be entered at TYPE OTHER terminals, and DECserver 100 messages are not displayed. The Digital LA50 is an example of a TYPE OTHER terminal.

The default type is **HARDCOPY**.

NAME

The entry for the NAME characteristic is the terminal name. You can specify the user's name, the location of the terminal, or any other convenient identification. The NAME appears in the SHOW TERMINAL display. It can be up to 12 characters long, and there is no default name.

BROADCAST

With BROADCAST set to **ENABLED**, the terminal user receives local broadcast messages sent from the other DECserver 100 terminals. The messages appear while the terminal is in either local or service mode. You can disable BROADCAST to prevent incoming messages from overwriting data on the terminal screen. The default is **ENABLED**.

MESSAGE CODES

Each DECserver 100 message has a message code. For example, in the following error message, the number 701 is the message code.

```
Local -701- Command syntax error
```

If you define MESSAGE CODES as DISABLED, the message code does not appear. The default is ENABLED.

VERIFICATION

Verification messages are informational notes sent to the terminal when the user initiates, terminates, or switches sessions. If a lot of switching is done, you can enter DISABLED for VERIFICATION, and these informational messages do not appear. This does not affect the receipt of warning and error messages. The default for VERIFICATION is ENABLED.

2.6 DECserver 100 Initialization

You can initialize the DECserver 100 in one of two ways: by electrical power-up, or by entering the INITIALIZE command. The following sequence occurs at initialization. When you enter the INITIALIZE command, the sequence begins at step 1. When you power-up the server, the sequence begins at step 3.

1. The DECserver 100 sends warning messages to users at regular intervals. These indicate that initialization is about to begin.
2. The server disconnects all active terminals from network services.
3. The server diagnostic self-test executes (refer to Section 4.1).
4. A load host down-line loads the operational server software, and the server becomes operational.
5. The user presses **(RET)** several times, and, depending on the terminal's characteristics, one or more of the following occurs:
 - a. If AUTOBAUD is enabled at a terminal, the server adjusts the terminal port for the terminal's speed, character size, and parity.
 - b. If LOGIN is enabled at a terminal, a pound sign prompt (#) appears at the terminal with an audible beep signal.
 - c. Except when a dedicated service is defined for a terminal, the user name prompt (Enter username>) appears, and the user types his or her user name.
 - d. With AUTOCONNECT enabled, connection to a preferred or dedicated service is carried out.
 - e. If no dedicated or preferred service is defined, the local mode prompt (Local>) appears.

Options for the INITIALIZE command alter the initialization process outlined above:

- You can suspend the beginning of initialization for a specified number of minutes. The server transmits warning messages at regular intervals to alert terminal users. (INITIALIZE ABORT allows you to cancel the initialization.)
- You can inhibit the CONNECT command and the AUTOCONNECT function at each terminal. This option is useful if you want the terminals to remain in local mode when initialization is completed.
- You can cause the server to execute nonstandard diagnostic self-tests.

Chapter 5 contains the command description and syntax for the INITIALIZE command.

2.7 Setting Characteristics to Factory Specifications

The software reset feature permits you to change the data in the permanent database to Digital factory specifications. This feature is useful, for example, if you forget the passwords you set up with the DEFINE PRIVILEGED PASSWORD command or the DEFINE LOGIN PASSWORD command. Digital recommends that software reset be executed only when absolutely required.

To cause a software reset, locate the software reset (S1) button on the DECserver 100 hardware unit. Simultaneously press this button while you remove and reinsert the power cord. An immediate server initialization occurs; all permanent and operational database parameters are reset to factory specifications.

Following the reset procedure, the privileged password is “system”, and the login password is “access”. To maintain security, you should change these passwords (see Sections 2.2 and 2.3).

2.8 Setting Up a Printer

You can replace a DECserver 100 terminal with an asynchronous, serial printer (or other nonkeyboard device). This allows DECserver 100 terminal users to obtain hard-copy printouts from network services.

When the printer is installed, it becomes a DECserver 100 terminal; you define terminal characteristics for it as you do for any attached terminal (refer to Section 2.5). Table 2-3 shows terminal characteristics values that are required to make the printer operational. Use the DEFINE TERMINAL command to set up these characteristics.

Table 2-3: Setting Up Terminal Characteristics for a Printer

| Characteristic | Value |
|-----------------------|---|
| AUTOBAUD | DISABLED |
| AUTOCONNECT | ENABLED |
| CHARACTER SIZE | The operational character size for the printer |
| DEDICATED SERVICE | The service name for the service node to which the printer is connected |
| PARITY | The operational parity for the printer |
| SPEED | The operational speed for the printer |
| TYPE | OTHER |

After you define terminal characteristics for the printer, log out the printer using the privileged LOGOUT command. This command moves a copy of the terminal characteristics from the server's permanent database to its operational database. Then issue the CONNECT TERMINAL *n* command to establish a session between the printer and the dedicated service.

Here is an example of commands for setting up a printer that you wish to connect to the service LABTEST. It is installed at terminal port 8 on the DECserver 100.

```
Local> DEFINE TERMINAL 8 AUTOBAUD DISABLED, AUTOCONNECT ENABLED
Local> DEFINE TERMINAL 8 SPEED 1200 CHARACTER SIZE 8 PARITY NONE
Local> DEFINE TERMINAL 8 TYPE OTHER DEDICATED SERVICE LABTEST
Local> LOGOUT TERMINAL 8
Local> CONNECT TERMINAL 8
Local> SHOW SESSIONS TERMINAL 8
```

The SHOW SESSIONS display verifies that terminal 8 is connected to the dedicated service.

If you wish to connect this printer temporarily to another service, use the privileged DISCONNECT and CONNECT commands. For example:

```
Local> DISCONNECT TERMINAL 8
Local> CONNECT TERMINAL 8 SERVICE DEVELOP
```

These commands connect the printer to the service DEVELOP.

To use the printer, the terminal users need to know its device name at the service node. The device name changes when the system manager reboots the service node, when you initialize the server, and when you connect the printer to the service.

The procedure for determining the printer device name depends upon the operating system for the service node. As an example, issue the following commands for a service node with the VAX/VMS operating system. Local> prompts you for DECserver 100 commands which you enter in local mode. The dollar sign (\$) prompts you for VAX/VMS commands which you enter in a service session with the VAX/VMS system.

```
Local> DISCONNECT TERMINAL 8
```

```
$ SHOW DEVICES
```

```
Local> CONNECT TERMINAL 8
```

```
$ SHOW DEVICES
```

When you type the second SHOW DEVICES command, a new LT: name appears. This is likely to be the current device name for the printer.

When you determine the LT: device name, the terminal users can set up and utilize the printer as they would any printer on the service node. For example, the printer can be allocated by an application process or configured into a printer queue. Refer to the VAX/VMS documentation for details.

3

Managing and Monitoring

As the server manager, you normally have responsibility for managing and monitoring the DECserver 100 and its terminals. This chapter discusses the DECserver 100 commands that you can use to assist you. Chapter 5 covers each command in more detail.

3.1 Managing the DECserver 100

The commands described in this section help you do the following:

- Ensure that only authorized persons gain access to DECserver 100 facilities.
- Manage the access to service mode for keyboard and nonkeyboard terminals.
- Communicate with the terminal users.
- Manage the DECserver 100 from a remote console.

3.1.1 Security Management

The SET PRIVILEGED command gives you privileged status and makes your terminal the privileged terminal (refer to Section 2.1). This command requires the privileged password which helps maintain the security of the server and terminals. For example, to acquire privileged status with the privileged password, A1B2C3, use this command:

```
Local> SET PRIVILEGED  
Password> A1B2C3 (not echoed)
```

You return to nonprivileged status by logging out or by entering the SET NOPRIVILEGED command.

```
Local> SET NOPRIVILEGED
```

The privileged commands cannot be used until you reenter privileged status with the SET PRIVILEGED command.

You can transfer your privileged status from one terminal to another with the SET PRIVILEGED OVERRIDE command. This is a form of the SET PRIVILEGED command, and you must know the privileged password. You may wish to use this command, for example, if the privileged terminal becomes nonoperational. Here is an example using the privileged password A1B2C3.

```
Local> SET PRIVILEGED OVERRIDE  
Password> A1B2C3 (not echoed)
```

This command makes your current terminal the privileged terminal. The former privileged terminal becomes nonprivileged.

Sections 2.2 and 2.3 discuss how you set up the login and privileged passwords. To maintain security, change these passwords regularly. Use the SET LOGIN PASSWORD or SET PRIVILEGED PASSWORD command to select a new password. This password takes effect immediately.

You should also set up the new password with DEFINE LOGIN PASSWORD or DEFINE PRIVILEGED PASSWORD. The new password then remains in effect each time the server is initialized.

For example, to change the privileged password from A1B2C3 to G7H8I9, enter the following:

```
Local> SET PRIVILEGED PASSWORD  
Password> G7H8I9 (not echoed)  
Verification> G7H8I9 (not echoed)  
  
Local> DEFINE PRIVILEGED PASSWORD  
Password> G7H8I9 (not echoed)  
Verification> G7H8I9 (not echoed)  
  
Local>
```

3.1.2 Service Mode Management

As the server manager, you can control the terminal users' access to service mode. Sections 2.4 and 2.5 describe how to use terminal and server characteristics to do this. You can also use the privileged form of several DECserver 100 commands.

The privileged CONNECT and DISCONNECT commands allow you to control the connections of a nonkeyboard device (for example, a printer) to network services. However, these commands do not permit you to connect or disconnect "regular" interactive terminals.

A nonkeyboard device takes the place of an interactive terminal. The following notes apply to a nonkeyboard device:

- The device must be designated as TYPE OTHER before you issue the CONNECT command (refer to Section 2.5.5).
- Only one session at a time can be active for the device.

Connect a nonkeyboard device to a service by specifying its terminal number when you enter the **CONNECT** command. For example, to connect terminal 8 to the service **SALES**, type the following:

```
Local> CONNECT TERMINAL 8 SERVICE SALES
```

You can switch a nonkeyboard device to an alternate service even if it is currently connected to a dedicated service. To disconnect the nonkeyboard device from **SALES**, and connect it to **RESEARCH**, enter these commands:

```
Local> DISCONNECT TERMINAL 8  
Local> CONNECT TERMINAL 8 SERVICE RESEARCH
```

As the server manager, you can use the privileged form of the **LOGOUT** command to log out any of the terminals. The terminal you specify can be of any type, including the users' interactive terminals. The command terminates all service sessions at the specified terminal. For example, to disconnect terminal 4 from all its sessions, enter the following:

```
Local> LOGOUT TERMINAL 4
```

Use caution when logging out a user's terminal. When you log out a terminal you abruptly stop all service sessions and data may be lost.

3.1.3 Communication with Terminal Users

The privileged **BROADCAST** command lets you send messages to one particular terminal or to all the terminals. This command can help you manage the server and terminals. For example, if you change the group codes for the terminals, you can use **BROADCAST** to alert the users of the change.

Here is a **BROADCAST** command that transmits the message, "You can now use the service **RESEARCH**", to terminal 3.

```
Local> BROADCAST TERMINAL 3 "You can now use the service RESEARCH"
```

The following command sends the same message to all the terminals.

```
Local> BROADCAST ALL "You can now use the service RESEARCH"
```

Note that a terminal receives **BROADCAST** messages only when its **BROADCAST** characteristic is enabled (see Section 2.5.5).

3.1.4 Remote Management of the DECserver 100

If you are responsible for several DECserver 100 systems, it may be convenient for you (or the network manager) to manage them all from a central location. The server software permits you to use DECserver 100 commands at a single remote terminal rather than at terminals attached to each server.

The terminal, called a remote console, is connected locally to a node on the same Ethernet as the servers. The node must have DECnet Phase IV software. From the remote console, you have access to any DECserver 100 and can use the DECserver 100 commands. Figure 3-1 shows a remote console on an Ethernet.

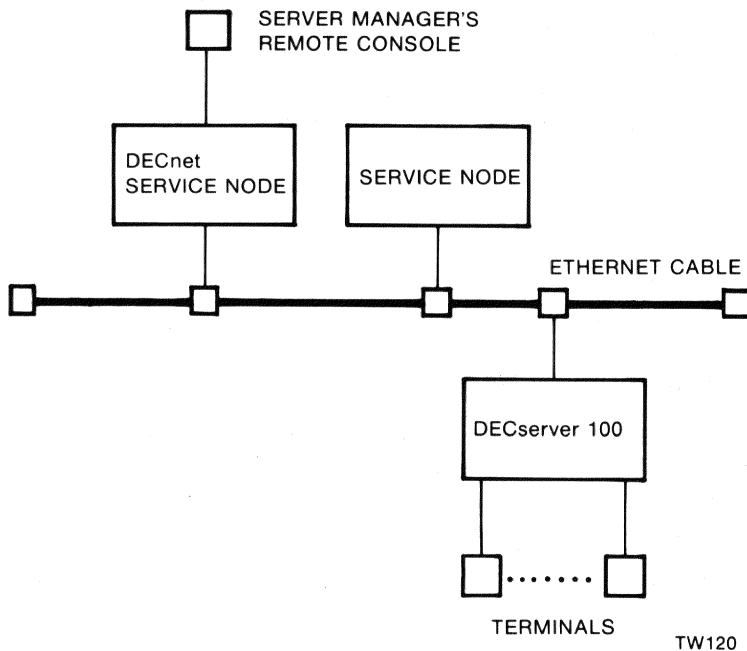


Figure 3-1: Server Manager's Remote Console on an Ethernet

3.1.4.1 Setting Up a Remote Console — To set up a remote console, use the network control facility for the node system where the console terminal is attached. The system manager and the operating system documentation can assist you. For most operating systems, a single network management command establishes the link to the DECserver 100.

To disconnect the remote console from the server, you enter another command that returns you to the node system's command mode. This command also depends upon the operating system being used.

As an example of setting up a remote console, here is the procedure for the VAX/VMS operating system.

Type the following command to gain access to the Network Control Program (NCP). (The dollar sign (\$) is the system prompt.)

```
$ NCP
```

When you receive the NCP prompt, enter either the NCP CONNECT NODE or CONNECT VIA command. Here is the syntax for each:

CONNECT NODE *server-node-name*

CONNECT VIA UNA-0 PHYSICAL ADDRESS *Ethernet-address*

Use the CONNECT NODE command if the node is a load host which has the DECserver 100 configured in its database.

Use the CONNECT VIA command if the server has not been configured in the node's database. The system manager can assist you.

When the NCP CONNECT command executes successfully, press **RET** on the terminal. The following message and a pound sign (#) prompt appear (an audible beep signal accompanies the prompt):

```
Console connected (Press CTRL/D when finished)
```

```
#
```

The prompt indicates that the link to the server has been made and you must enter the login password. Following successful login, you can begin using DECserver 100 commands.

To terminate a remote console session on the VAX/VMS node, enter **CTRL/D**. The service node prompt reappears. Control passes again to the VAX/VMS system.

3.1.4.2 Using DECserver 100 Commands on a Remote Console — The DECserver 100 pound sign (#) prompt appears when you successfully connect the remote console through any node (regardless of the node's operating system).

You first enter the DECserver 100 login password. (The terminal characteristic LOGIN is always enabled for the remote console.) If it has not been changed, the password is "access". Following successful login, the user name prompt (Enter user-name>) appears, and you are in local mode on the DECserver 100.

The remote console is not physically connected to a terminal port on the DECserver 100 unit. This affects some of the DECserver 100 commands that you can enter.

You can issue any DECserver 100 command at the remote console except for the following:

DEFINE TERMINAL for the remote console
SET TERMINAL for the remote console
SHOW TERMINAL for the remote console

You can, however, issue these three commands for any of the “regular” terminals. Information about the remote console does not appear for the following commands typed at any terminal:

SHOW SESSIONS ALL
SHOW TERMINAL ALL
SHOW USERS

The terminal characteristics for the remote console are fixed and defined as follows:

AUTOBAUD DISABLED
AUTOCONNECT DISABLED
BACKWARD SWITCH NONE
BROADCAST DISABLED
DEDICATED SERVICE NONE
FLOW CONTROL DISABLED
FORWARD SWITCH NONE
GROUP CODES ALL ENABLED
LOCAL SWITCH ~
LOGIN ENABLED
LOSS NOTIFICATION ENABLED
MESSAGE CODES ENABLED
PREFERRED SERVICE NONE
SESSION LIMIT 1
TYPE HARDCOPY
VERIFICATION ENABLED

The characteristics SPEED, CHARACTER SIZE, and PARITY are irrelevant for the remote console.

Here are other notes about DECserver 100 commands for the remote console:

- You can enter the CONNECT command to use network services. However, you can have only one active session (up to four are possible at the other terminals).
- If you connect to a service node with the remote console, you should not activate another remote console session from that node.
- You can use privileged commands if you know the privileged password for the SET PRIVILEGED command.
- Use the fixed local switch character (~) to enter local mode.

Personal computer (PC) file transfers are not supported over the remote console.

3.2 Monitoring the DECserver 100

DECserver 100 SHOW commands enable you to monitor the server, its terminals, and the interaction among the service nodes. This section discusses what to look for in the SHOW commands displays. Chapter 5 describes the command syntax for each command. Chapter 5 also has examples of the displays and descriptions of the data fields in the displays.

3.2.1 SHOW COUNTERS

A counter is a number that shows how many times a certain event has occurred. The server software keeps track of Ethernet and LAT message transmissions using counters. The SHOW COUNTERS data appears under two headings: Ethernet Counters and Server Counters.

- Ethernet Counters lists the counters for datagrams sent between the server and all nodes on the Ethernet.
- Server Counters lists the counters for messages transmitted between the server and the LAT service nodes.

Two other commands are associated with counters: ZERO COUNTERS and MONITOR. ZERO COUNTERS resets all the LAT counters and Ethernet counters to zero. MONITOR generates a continuously updated SHOW COUNTERS display. When you enter MONITOR, a SHOW COUNTERS display appears, and the counter totals change while the display is on your terminal screen.

Counters can help you estimate DECserver 100 traffic on the network for different time periods. For example, if you zero the counters at the start of each day, you can gain information about day-to-day server usage.

Your network manager can use the data to calculate the average utilization of the Ethernet and the service nodes. Also, the counters can be combined with those from other servers to calculate the network's capacity to handle more traffic.

SHOW COUNTERS is also useful for detecting possible network problems. Use the following guidelines when you examine the SHOW COUNTERS display.

For the Ethernet counters:

- Normally, the counters on the right hand side of the display should be 0 except those for Block Check Error, Framing Error, and User Buffer Unavailable. These should accumulate at a rate of less than 2 counts per day. It is normal to experience some errors when nodes are added to the Ethernet.
- The value for Frames Sent, Deferred should be less than 5% of the value for Frames Sent.
- The value for Frames Sent, 1 Collision and for Frames Sent, 2+ Collisions should be less than 1% of that for Frames Sent.

For the Server counters:

- The Messages Re-transmitted value should be less than 1/1000 of the value for Messages Transmitted.
- The Duplicates Received value should be less than 1/1000 of the value for Messages Received.
- The values for Illegal Messages Rcv'd and Illegal Slots Rcv'd should be 0.

Counters in excess of these guidelines may indicate a network problem. Contact your network manager and refer to Section 4.5.

3.2.2 SHOW NODES

When you enter a specific node name in the SHOW NODES command, the counter values for that service node appear in the display. The following guidelines apply:

- The Messages Re-transmitted value should be less than 1/1000 of the value for Messages Transmitted.
- The Duplicates Received value should be less than 1/1000 of the value for Messages Received.
- The value for Illegal Messages Rcv'd should be 0.

If the SHOW NODES data exceeds these guidelines, contact your network manager.

The Status column in the SHOW NODES display can help you monitor the use of service nodes. The status indicates how many terminal users are connected to each node.

3.2.3 SHOW SERVER

You use the SHOW SERVER display when you define server characteristics. You can also use it as a maintenance tool.

The display for the privileged SHOW SERVER command lists Server Status and Software Status. It also identifies the load host and dump host.

The numbers for Server Status should be all zeros. A hardware error produces nonzero values.

A Software Status other than Normal indicates that a fatal bugcheck occurred prior to the latest power-up of the DECserver 100. The status shows the values for server system parameters at the time of the fatal bugcheck. It also notes the Ethernet address of the host that received the up-line dump of the server memory following the fatal bugcheck.

Refer to the troubleshooting procedures in Section 4.2 if abnormal data appears for Server Status or Software Status.

3.2.4 SHOW TERMINAL

Three counters in the SHOW TERMINAL display can indicate possible problems. These are the counters for Framing Errors, Parity Errors, and Overrun Errors. Under most conditions, all three counters are zero.

If the Overrun Errors value accumulates to more than 1 or 2 per day, you may have flow control problems. If the terminal supports XON/XOFF flow control, make sure that this parameter is enabled (refer to the operations guide for the terminal). Also, set up the terminal characteristic, FLOW CONTROL, to ENABLED (see Section 2.5.3).

If the counter for Framing Errors or Parity Errors accumulates to greater than about 20 per day, you may have terminal line problems. Refer to the troubleshooting procedures in Section 4.3.

3.2.5 SHOW USERS

The SHOW USERS command is a tool for general monitoring of the terminals' use. You can use it to determine which terminals are in use at any time and to identify the terminal users.

4

DECserver 100 Troubleshooting

When you troubleshoot the DECserver 100, you try to solve problems affecting the server and its attached terminals.

A problem can occur as a result of a failure in one of the five network components shown in Figure 4-1. Each network component is broken down into its constituent parts in Figure 4-2. These parts can be hardware (represented by the solid-line boxes) or software (represented by the dashed-line boxes). Refer to these figures as a guide when you use the information in this chapter.

You can replace some of the components and their parts yourself, or you can call a Digital representative to replace them for you. Many of the parts must be replaced by a qualified Digital service representative.

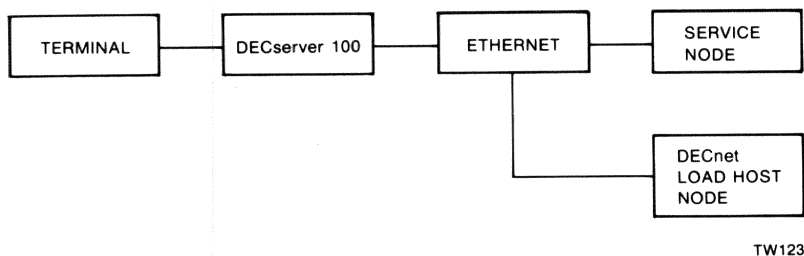


Figure 4-1: LAT Network Components

This chapter consists of the following sections:

- Section 4.1. suggests initial steps to take when you become aware of a problem.
- Section 4.2. discusses how to troubleshoot problems that involve all the terminals. These problems may result from a failure in the DECserver 100.
- Section 4.3 discusses how to troubleshoot problems that affect one or more individual terminals, but not all the terminals.
- Sections 4.4 and 4.5 cover problems involving service nodes on the Ethernet network and the Ethernet interface itself.
- Section 4.6 describes how to use the maintenance services provided by Digital.

Sections 4.2 through 4.5 list the possible causes of a problem and the corrective action required to solve the problem.

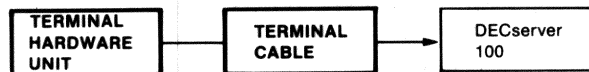
4.1 What To Do First

To begin troubleshooting, find out first if the problem affects all the terminals or only some of the terminals.

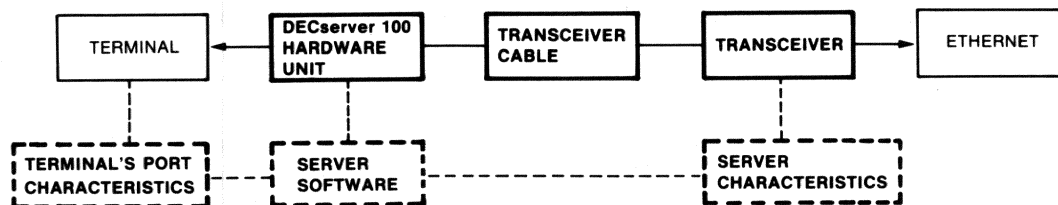
- When the problem involves all the terminals, do the following:
 1. If message number 913 appears on the console terminal, go no further in this sequence of steps. Refer directly to Section 4.2.5.
 2. If the terminal users can still enter DECserver 100 commands at their terminals, have them finish their active sessions. Then have them log out their terminals. If they cannot use their terminals, go on to step 3.
 3. Initialize the DECserver 100 by disconnecting and then reconnecting the server's power cord. (This is a "power-up" of the server.) The server executes its diagnostic self-test. After about 20 seconds, the green light on the server: stays off, blinks, or stays on.
 4. If the green light stays off, go on to Section 4.2.1. If the light blinks go, to Section 4.2.2. If the light stays on, refer to Sections 4.2.3 through 4.2.6.
- If the problem affects fewer than all the terminals, go on to Section 4.3
- If you become aware of a problem because an error message appears at a terminal, find the error message in Appendix A. The text in Appendix A refers you to a troubleshooting procedure in this chapter.

The diagnostic self-test is an important feature of the DECserver 100. During the self-test, internal software checks the state of a number of hardware components. The green light on the server shows the result of the test.

When a condition generates message number 913, the server initializes itself automatically.



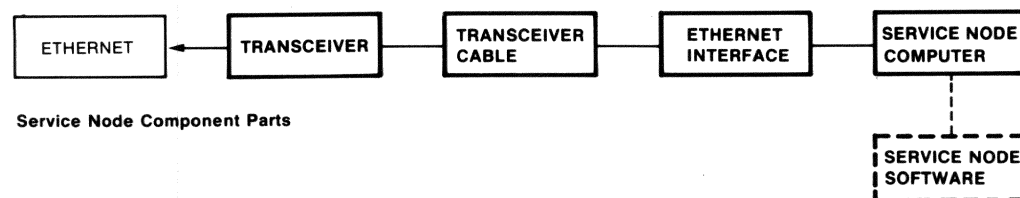
Terminal Component Parts



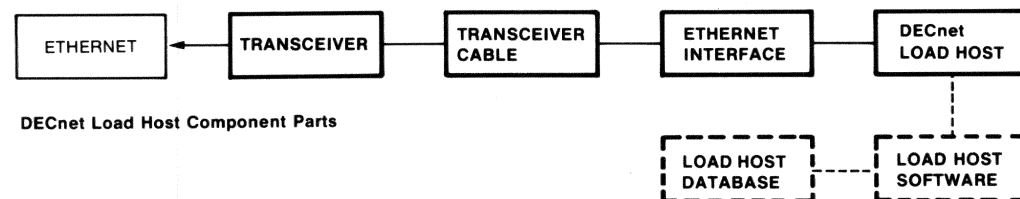
DECserver 100 Component Parts



Ethernet Component Parts



Service Node Component Parts



DECnet Load Host Component Parts

TW124

Figure 4-2: Breakdown of LAT Network Components

After completion of a self-test, you can reinitialize the DECserver 100 by pressing **CTRL/P** on the console terminal. You need not power-up the server. This reinitialization works if the problem involves either down-line loading of the server software or a transceiver malfunction.

NOTE

Have a console terminal defined. The console terminal (the default terminal port is port 1) receives status messages that make the troubleshooting process much easier. For server installation, the console terminal must be configured to operate with a speed of 9600 bps and a character size of 8 bits with no parity. Following installation, you can use the **DEFINE TERMINAL** command to set up the console terminal with other values for speed, character size, and parity.

4.2 Problems Affecting All Terminals

This section describes what to do after you initialize the server for problems that affect all the terminals.

The green light on the DECserver 100 unit is in one of three states approximately 20 seconds after you initialize the server.

- **Off** – the server has no power or has a serious hardware problem (see Section 4.2.1).
- **Blinking** – the server found a nonfatal problem during its self-test (see Section 4.2.2).
- **On continually** – the server did not find any errors during its self-test (see Sections 4.2.3 through 4.2.6).

4.2.1 Server Green Light Off

Problem Power is not reaching the DECserver 100.

Correction Secure the power cable at the server and wall outlet.

Correction Check the wall outlet using another appliance or light; or plug the server power cord into another outlet. If no power is available, check the circuit breaker for the outlet.

Correction Ensure that the voltage select switch is set to the correct voltage for your country (120V for North America). Refer to the *DECserver 100 Terminal Server Site Preparation/Hardware Installation Guide* to determine the correct setting.

Correction Determine if the fuse has blown on the DECserver 100 unit. If necessary, replace the fuse as shown in the *DECserver 100 Terminal Server Site Preparation/Hardware Installation Guide*.

Correction Replace a defective server power cable with a new cable (you can use the power cord for a VT100 terminal).

Problem A hardware error has occurred which makes the DECserver 100 nonoperational. The server and the terminals cannot function.

Correction There is no corrective procedure for this problem. Return the unit to Digital for service or replacement (see Section 4.6).

4.2.2 Server Green Light Blinking

If you see a blinking green light after power-up, it indicates the server has a nonfatal problem detected during self-test. The primary problem indicator in this case is the message that appears on the server's console terminal (terminal 1 by default). The message has this format:

```
Local -911- WARNING - Non-fatal hardware error detected
Server status nnnn, terminal status nn nn nn nn nn nn nn nn
```

The message contains a status code *nnnn* for the server itself and a status code *nn* for each of the server's eight terminal ports. For both codes, the *n*'s are either 1 or 0.

Section 4.3.2 discusses the terminal status codes.

The location of the number 1 in the server status code tells you what error was detected. (Note that there can be from 1 to 4 ones in the 4-digit code.)

4.2.2.1 nnn1 – Server Parameters Checksum Error

Problem The server characteristics in the server's permanent database have been damaged. The factory set defaults are now in effect.

Correction Reenter the desired server characteristics using the DEFINE SERVER command (see Chapter 5). Reinitialize the server with the INITIALIZE command or a power-up to bring these parameters into effect. If this action fails to correct the problem, the memory used to store the characteristics is faulty. You can continue to use the server with the factory default characteristics, or see Section 4.6 for information about returning the unit to Digital.

4.2.2.2 nn1n – Hardware Revision Level Checksum Error

Problem The server's nonvolatile memory is faulty.

Correction There is no correction for this problem. You can continue to use the server. However, performance enhancements based upon hardware revisions are not in effect. This means that the DECserver 100 may run slightly slower than it would otherwise. If you wish to return the unit to Digital, refer to Section 4.6.

With this problem, asterisks (*) appear in the hardware revision field in the SHOW SERVER display.

4.2.2.3 n1nn – Ethernet Loopback Error — The following error message appears on the console terminal:

```
Local -910- Image load not attempted, network communication error
```

Problem There is a faulty or loose transceiver cable.

Correction Check the cable that runs from the DECserver 100 unit to the transceiver, DELNI, or Etherjack. Be sure the cable is securely connected at both ends. Check the cable for any signs of damage.

If you have an H4080 turnaround connector, you can verify the operation of the transceiver cable. Replace the transceiver with the H4080 and then initialize the server by entering `CTRL/P`. If the blinking light and the *n1nn* status persist after the next self-test, the cable is likely to be at fault. If the green light glows steadily, the transceiver or Ethernet tap may be malfunctioning (see below).

NOTE

When the green light glows steadily with the H4080 replacement, the server attempts to down-line load the server software. Since the H4080 is not connected to the network, the down-line load fails.

If you do not have an H4080 turnaround connector you should connect the server to a transceiver cable that you know is working. Make sure all cable connections are secure, and then press `CTRL/P`. If the server still shows a status of *n1nn*, see Section 4.6 for information about services offered by Digital to assist you in problem resolution. If the green light glows steadily, you should replace the original transceiver cable or use the cable you know to be workable.

Problem The transceiver is faulty.

Correction If you have an H4080 turnaround connector you can verify the operation of the server's transceiver interface and transceiver cable. Remove the cable from the H4000 transceiver and connect it to the H4080. Initialize the server with `CTRL/P` to start its self-test.

The following results occurring together indicate that the transceiver or the Ethernet tap are faulty: (1) the green light on the DECserver 100 is steady rather than blinking, (2) the console terminal displays the messages below at approximately 30 second intervals:

```
Local -902- Waiting for Image Load  
Local -912- Load failure, timeout
```

If you do not have an H4080 turnaround connector, connect the DECserver 100 to a known good transceiver. Press **CTRL/P**. If the green light stays on, the original transceiver or its Ethernet tap is likely to be faulty. To determine which, perform the following procedure.

NOTE

Digital does not support all non-Digital transceivers. Refer to the *DECserver 100 Software Product Description* for information about supported transceivers.

Problem The Ethernet tap is bad.

Correction Move the transceiver to a new location and reinstall. Press **CTRL/P**. If the green light glows continuously, the new Ethernet tap is good, and the DECserver 100 will work normally. If the problem persists, the transceiver is probably bad. Replace it with another transceiver and retry.

4.2.2.4 1nnn – Ethernet Heartbeat Error

Problem The transceiver is a non-Digital transceiver that was made to conform to the Ethernet Version 1.0 specification. Some manufacturers' transceivers conform to this earlier Ethernet specification which did not include the heartbeat signal. All Digital transceivers conform to Version 2.0 and supply this signal.

Correction If you are using a non-Digital transceiver, you should disable the server's heartbeat detection action by defining the server characteristic, HEARTBEAT, as DISABLED. Enter the DEFINE SERVER HEARTBEAT DISABLED command (see Chapter 5). Reinitialize the server to make this change operational.

NOTE

The blinking green light and status 1nnn still appear even with HEARTBEAT disabled. However, the server will function normally.

Problem There is a transceiver fault or a cabling problem.

Correction Refer to Section 4.2.2.3.

4.2.3 No Console Messages

The console terminal has no display when the server initializes.

Problem There is no console terminal defined for the port to which the terminal is physically connected.

Correction Refer to Section 2.4 to set up a console terminal. Then check your setup by entering the `SHOW SERVER` command to list the console port. Insure that the terminal is physically connected to that port on the DECserver 100 unit.

Problem The console terminal is faulty.

Correction Refer to Section 4.3 for troubleshooting steps for problems that affect individual terminals.

Problem The console terminal's characteristics are not set up correctly.

Correction Refer to Section 4.3 for troubleshooting steps for problems that affect individual terminals.

NOTE

For server installation, the console terminal must be configured to operate with a speed of 9600 bps and a character size of 8 bits with no parity. Following installation, you can use the `DEFINE TERMINAL` command to set up the console terminal with other values for speed, character size, and parity.

4.2.4 Down-line Loading Problems

If you have a down-line load problem, the user name prompt (Enter username>) does not appear on the terminals. Also, all the terminals are nonresponsive; they do not respond to your keyboard entries.

Two sequences of 900 series messages on the console terminal indicate down-line loading problems. Each is covered in the following sections.

NOTE

Have event logging enabled for events 0.3 and 0.7 on all DECnet load hosts that may be down-line loading the server. Refer to the DECnet load host documentation for information about event logging, or see the system manager for the DECnet load host.

4.2.4.1 Down-line Load Starts, Then Fails — The following sequence of message appears on the console terminal at 30 second intervals:

```
Local -902- Waiting for image load
Local -903- Loading from host load-host-address
Local -912- Load failure, timeout
```

Problem The directory with the software image on the load host is not defined. For example, on a load host running VAX/VMS (V4.0), the directory with the DECserver 100 software image, MOM\$LOAD, is not defined.

Correction Have the system manager execute the commands required to define the directory. For VAX/VMS (V4.0), he should enter the following statement in the system startup file on the load host, and then execute the command itself.

```
$ DEFINE/SYSTEM/EXEC/NOLOG MOM$LOAD SYS$SYSROOT:[DECSERVER]
```

Problem The DECserver unit has been incorrectly configured on the load host, or the server software has not been installed properly.

Correction Perform the procedures outlined in Section 4.2.4.2.

Problem The server characteristic, SOFTWARE, has been changed. The new file name for the server software image is not defined on the load host.

Correction Normally the server SOFTWARE characteristic should be defined as PS0801ENG. Section 2.4 tells you how to reset SOFTWARE to PS0801ENG. The load host system manager can ensure that the file name on the load host is correct. For example, the file specification for the server software on a VAX/VMS (V4.0) load host should be MOM\$LOAD:PS0801ENG.SYS.

4.2.4.2 Down-line Load Does Not Start — The following sequence of messages appears on the console terminal at 30 second intervals:

```
Local -912- Load failure, timeout
Local -902- Waiting for image load
```

Problem The load host does not contain a node database entry for the server, or does not contain the proper node information.

Correction Verify that: (1) the load host contains a node entry for the server, (2) all information pertaining to down-line loading is correct.

For example, for a VAX/VMS load host, ask the system manager to do the following:

1. Execute the command file DSVCONFIG.COM in the directory with the logical name SYS\$SYSROOT:[DECSEVER]. This is the procedure that he or she uses to configure a DECserver 100 in the host's database.
2. Enter number 1 in the Menu of Options. This option displays the DECnet address, DECnet node name, Ethernet address, and up-line dump file for the server. For example:

| DECnet Address | DECnet Node Name | Ethernet Address | Dump File |
|----------------|------------------|-------------------|---------------|
| 55.126 | LAT4 | 08-00-2B-00-16-AC | PSDMP16AC.SYS |

If the information is wrong, the system manager can correct it by running DSVCONFIG.COM and choosing item 2 in the Menu of Options.

3. Enter the following NCP command using the server's DECnet node name. This command lists the server's characteristics stored in the host's database.

```
NCP>SHOW NODE LAT4 CHARACTERISTICS
```

Here is an example of the display that this command generates:

```
Node Volatile Characteristics as of 2-OCT-1984 16:40:53
Remote node = 55.126 (LAT4)
Service circuit = UNA-0
Hardware address = 08-00-2B-00-16-AC
Load file = SYS$SYSROOT:[DECSEVER]PS0801ENG.SYS
Dump file = SYS$SYSROOT:[DECSEVER]PSDMP16AC.SYS
```

If the information in step 3 is complete and correct, the server is configured properly on the load host. If it is not, the system manager can make corrections using DSVCONFIG.COM. He or she may also need to use NCP commands to correct the "Load file" file name.

Problem The directory with the software image on the load host is not defined. For example, on a load host running VAX/VMS (V4.0), the directory with the DECserver 100 software image, MOM\$LOAD, is not defined.

Correction Have the system manager execute the commands required to define the directory. For VAX/VMS (V4.0), he should enter the following statement in the system startup file on the load host, and then execute the command itself.

```
$DEFINE/SYSTEM/EXEC/NOLOG MOM$LOAD SYS$SYSROOT:[DECSERVER]
```

Problem The server's DECnet load host is not available.

Correction Check to be sure the server's DECnet load host is available on the network. Be sure that the load host has the network properly turned on and that the Ethernet circuit is in the ON state. Use the load host's Network Control Program (NCP) as documented in the load host's DECnet documentation to verify that the network is up, that the Ethernet connection is on, and that service is enabled. An example of the NCP commands necessary to perform these checks and the NCP output is shown below:

```
NCP>SHOW EXECUTOR STATUS
```

```
Node Volatile Status as of 19-AUG-84 13:12:00
```

```
Executor node = 4.6(BOSTON)
```

```
State = on
```

```
Physical address = AA-00-04-00-06-10
```

```
NCP>SHOW ACTIVE LINES STATUS
```

```
Active Line Volatile Status as of 19-AUG-84 13:12:15
```

| Line | State |
|-------|-------|
| UNA-0 | on |

```
NCP>SHOW ACTIVE CIRCUITS STATUS
```

```
Active Circuit Volatile Status as of 19-AUG-84 13:12:25
```

| Circuit | State | Loopback Name | Adjacent Node | Block Size |
|---------|-------|------------------|------------------|---------------|
| UNA-0 | on | | 4.36(LAB01) | 576 |

NCP>SHOW ACTIVE CIRCUIT CHARACTERISTICS

Active Circuit Volatile Characteristics

Circuit = UNA-0

| | |
|-------------------|-------------|
| State | = on |
| Service | = enabled |
| Designated router | = 4.1 (TWO) |
| Cost | = 3 |
| Router priority | = 16 |
| Hello timer | = 15 |
| Type | = Ethernet |
| Adjacent node | = 4.1 (TWO) |
| Listen timer | = 45 |

Problem The server's DECnet load host is not on the same Ethernet.

Correction Have the network manager assign one of the nodes on the server's Ethernet to be a load host for the DECserver 100. Have the load host's system manager add the server to his database by running the DSVCONFIG program.

Correction Reconfigure the network to ensure that the load host is on the same physical Ethernet as the server.

Problem Transmissions between the DECserver 100 and the load host fail because of Ethernet circuit problems.

Correction Have the system manager of a DECnet Phase IV node execute the NCP LOOP CIRCUIT command with the DECserver 100 as the target node. The *LAT Network Manager's Guide* describes the LOOP CIRCUIT command. The NCP facility shows the results of the loopback test at the DECnet node.

4.2.5 Message Number 913 Appears

If message number 913 appears on the console terminal, it means that the DECserver 100 detected an internal fatal error (fatal bugcheck).

A software problem, or bug, is likely to cause only intermittent fatal bugchecks of the DECserver 100. Your unit may operate again for a period of time and then fail again. If there is more than one server on the Ethernet, the bug is likely to affect all the units.

If the fatal error was a hardware error, the problem probably affects only one of several DECserver 100 units. The hardware problem may be intermittent and only occasionally affect the unit.

After a fatal bugcheck, the server automatically executes its self-test and requests a down-line load of the server software. If the green light is off or blinking after the self-test, go to Section 4.2.1 or 4.2.2. Otherwise take the following steps.

Problem A fatal hardware error has been detected.

Correction There is no corrective procedure for this problem. If the failures happen often enough to be disruptive, return the unit to Digital and install a replacement. Record the values for the five parameters in the 913 error message. Forward this information and the server up-line dump file to Digital (see Section 4.6). Up-line dumping after a fatal bugcheck is discussed below.

If the replacement unit works correctly, it is likely that a hardware error caused the first unit to crash.

Two nonstandard self-tests can help you confirm a hardware failure in the original unit. If you can enter commands at a terminal, execute these tests by issuing the following INITIALIZE commands:

INITIALIZE DIAGNOSE FULL

INITIALIZE DIAGNOSE FULL COUNT *number*

Chapter 5 has the complete command description for the INITIALIZE command.

Use the first command to check for a hardware error that causes a crash each time you use the server (nonintermittent error). Use the second to check for intermittent errors. The green light on the server shows the result in the same manner as for the standard self-test.

The self-test for the first command takes about 90 seconds. The length of the self-test for the second command depends on the value you specify for *number*. When you increase *number* by 1, you add about 90 seconds to the length of the test. For example, a value of 320 for *number*, generates a test of about eight hours duration.

Problem A fatal software error has been detected.

Correction There is no corrective procedure for this problem. Record the values for the five parameters in the error message. Send this data and up-line dump file to Digital (see Section 4.6).

A fatal bugcheck automatically causes an up-line dump of server memory to an appropriate host node. If you have several dump hosts defined, you can determine the host that received the up-line dump by typing the privileged **SHOW SERVER** command. The Ethernet address of the dump host appears in the display.

The file name of the dump file on the host is:

PSDMPnnnn.SYS

Here *nnnn* are the last four digits of the server's Ethernet address. For example, a DECserver 100 with Ethernet address 08-00-2B-00-16-AC generates a dump file at **SYS\$SYSROOT:[DECSERVER]PSDMP16AC.SYS** on a VAX/VMS dump host.

If error message number 914 appears on the console terminal, the up-line dump is not successful. There may be Ethernet problems inhibiting transmissions between the server and the up-line dump host. Refer to Section 4.5

4.2.6 Terminal Port or Terminal Hardware Problems

If the situations discussed in Sections 4.2.1 to 4.2.5 do not apply, the behavior of the terminals is the primary indicator for troubleshooting.

Problem The terminals exhibit one or more of the following kinds of behavior:

- The terminals have no display, and do not respond to keyboard entries.
- The terminals have a screen display but are nonresponsive.
- Not all the characters appear on the terminal screens.
- Nonsense characters appear on the terminals.

Correction Go to Section 4.3 and carry out the troubleshooting procedures for individual terminals. If you solve the problem for one of the terminals, apply that solution to all the terminals.

4.3 Problems Affecting Individual Terminals

This section describes troubleshooting procedures to take when you experience a problem that appears to affect only some of the server's terminals.

4.3.1 Terminal Display Is Wrong

Refer to Table 4-1. Locate the text that describes the behavior of the terminal. Go down the list of possible problems, in order, and then to the problem number listed for each. Carry out the corrective action described in the section that addresses the problem.

If you cannot correct the problem, refer to Section 4.6 for information about services offered by Digital for problem resolution.

Problem 1 The terminal is receiving no power. The terminal's power indicator is off.

Correction Be sure the terminal is plugged into an outlet that has power. Check the power switch position to be sure the terminal is on. If the terminal has a fuse or circuit breaker, try replacing or resetting it. On most terminals, if you fail to see the cursor after approximately one minute, you can assume that the terminal either has no power or is faulty.

Problem 2 The terminal is faulty.

Correction Switch the terminal to its off-line mode (refer to the terminal operator's guide). If the problem behavior persists when you enter characters, the terminal is probably faulty.

Correction If possible verify the operation of the terminal at another location. Try to use the same terminal characteristics when performing this operation.

Problem 3 There is a loose or faulty terminal cable.

Correction Be sure the terminal cable is secure at both the terminal server and the terminal. If the cable is made of several sections, be sure all junctions are secure. Inspect the cable for any cuts or crimps. If the cable is not loose or damaged, try another terminal cable.

NOTE

Be sure to follow the EIA cabling recommendation for the type of cable you are using. In particular, do not exceed the maximum allowable length. Refer to the *DECserver 100 Terminal Server Site Preparation/Hardware Installation Guide*.

Table 4-1: Terminal Behavior and Possible Problems

| Behavior | Problem | Problem Number |
|---------------------------------------|---|-----------------------|
| No display and nonresponsive | No power to terminal | 1 |
| | Faulty terminal | 2 |
| | Loose or faulty terminal cable | 3 |
| | Terminal speed set incorrectly | 4 |
| | Terminal parity or character size set incorrectly | 5 |
| | Terminal failing to autobaud | 6 |
| | Dedicated service not available | 7 |
| | Faulty terminal port on server | 9 |
| | | |
| Not all characters displayed | Flow control disabled | 8 |
| | Terminal parity or character size set incorrectly | 5 |
| Nonsense characters displayed | Faulty terminal | 2 |
| | Loose or faulty terminal cable | 3 |
| | Terminal speed set incorrectly | 4 |
| | Terminal parity or character size set incorrectly | 5 |
| | Terminal failing to autobaud | 6 |
| | Faulty terminal port on server | 9 |
| | | |
| A working terminal no longer responds | Faulty terminal | 2 |
| | Loose or faulty terminal cable | 3 |
| | Terminal input speed set incorrectly | 4 |
| | Dedicated service not available | 7 |
| | Faulty terminal port on server | 9 |
| | | |

Problem 4 The terminal speed is set incorrectly.

Correction Following the procedure described in the terminal operator's guide, set the terminal speed to match the speed specified in the server's database; or modify the server's database to match the terminal's speed. The server supports the following speeds — 75, 110, 134, 150, 300, 600, 1200, 1800, 2000, 2400, 4800, 9600, and 19200 bits/second. If your terminal cannot be set to one of these speeds, you will not be able to use the terminal with the DECserver 100 terminal server. If you intend to use the autobaud feature with the terminal, the input and output speeds of the terminal must be set to the same setting (see Section 2.5.2).

Problem 5 The terminal parity or character size is not set correctly.

Correction Following the procedure described in the terminal operator's guide, set the terminal parity and character size to match the character size and parity specified in the server's database. Alternatively, modify the server's database to match the terminal's character size and parity. The server supports odd, even, and no parity terminals and character sizes of 7 and 8. If your terminal cannot be set to one of these parity and character size settings, you will not be able to use the terminal with the DECserver 100. If you intend to use the autobaud feature (see Section 2.5.2) with the terminal, the parity and the character size settings of the terminal must be:

- 8-bit character size and no parity
- 7-bit character size and even parity

If you cannot set the terminal to one of these settings, the terminal cannot be used with autobaud. You must set up the speed, character size and parity for the terminal port to match those for the terminal itself.

NOTE

The DECserver 100 does not support terminals using mark or space parity. Older Digital terminals, such as the LA36, may require setting up with jumpers to operate with the server. Refer to the terminal operator's guide for details.

Problem 6 The terminal is failing to autobaud.

Correction If the terminal is not properly set up, the server will be unable to autobaud the terminal. At an operable terminal, enter the `SHOW TERMINAL` command for the suspect terminal. See if the problem terminal is set up as an autobaud terminal. If autobauding is used, the terminal must be set up in one of the following configurations:

- Character size 8 and parity none or character size 7 and parity even
- Input and output speed (no split speeds allowed) set to: 75, 110, 134, 150, 300, 600, 1200, 1800, 2000, 2400, 3600, 4800, 9600, or 19200 bits/second.

Problem 7 The dedicated service is not available.

Correction If a terminal has a dedicated service and that service is not available, the terminal will appear to be nonresponsive. Use another terminal to verify if a dedicated service is set for the problem terminal. If one is set, verify that the service is available. If the service is available verify that the problem terminal and the service have a common group code enabled.

Problem 8 Flow control is disabled

Correction Set the `FLOW CONTROL` characteristic for the terminal to `ENABLED` using both the `SET TERMINAL` and `DEFINE TERMINAL` commands (refer to Chapter 5). This puts flow control in effect at the terminal's port on the server. Ensure that the flow control characters `XON (CTRL/Q)` and `XOFF CTRL/S)` are enabled at the terminal itself. (Refer to the terminal operator's guide.)

Problem 9 The terminal port in the server is faulty.

Correction Verify that the port hardware is faulty. Plug a loopback connector in the terminal's rear panel jack. Enter the `TEST TERMINAL LOOPBACK` command using the faulty terminal's number. (Since you must disconnect a terminal to install the loopback connector, you cannot execute `TEST TERMINAL LOOPBACK` for the terminal you are using.) Check the error counters. If the error counters are nonzero, then the port is faulty. Continue using the server with the faulty port, or return the DECserver 100 to Digital (see Section 4.6).

NOTE

When you use the `TEST TERMINAL LOOPBACK` command, the input and output speeds for the terminal port must be the same.

4.3.2 Blinking Green Light on Server

When the green LED on the server blinks after power-up, error message number 911 shows the results of the automatic server self-test (refer to Section 4.2.2). In the error message, a 2-digit code indicates the hardware status of each terminal port. (The leftmost 2-digit code is the status code for terminal port 1; the rightmost for terminal port 8.)

Frequently, terminal port hardware errors involve two terminals connected to adjacent ports on the DECserver 100. Because of this, nonzero terminal status codes may appear in pairs.

If a "1" appears in the status code for a terminal (regardless of the 4-digit server code), you have one of the following possible problems.

Problem A status of *n1* indicates a checksum error. The characteristics for the indicated terminal no longer pass the internal checksum test. The factory specified defaults are in effect.

Correction Use the DEFINE TERMINAL command to again set the terminal characteristics values to those you choose.

Initialize the server with a power-up. If the same error occurs, you can continue to use the server with the factory specified terminal characteristics, or return the server for repair or replacement as described in Section 4.6.

Problem A status of *1n* indicates a terminal port hardware error.

Correction There is no corrective procedure for this condition. You can continue to use the server with the bad terminal port or return the server for repair or replacement as described in Section 4.6.

4.3.3 PC File Transfer Fails

A terminal user can operate a personal computer (PC) as a DECserver 100 terminal. He or she can use the server to transfer files to and from service nodes. A file transfer can fail if the terminal or service node is set up incorrectly.

Problem Terminal characteristics are set up incorrectly.

Correction Use the SET TERMINAL command to eliminate all special characters in effect for the terminal. The following terminal characteristics should have the value NONE:

BACKWARD SWITCH
FORWARD SWITCH
LOCAL SWITCH

Set the following terminal characteristics to DISABLED:

BROADCAST
FLOW CONTROL
LOSS NOTIFICATION

In addition, character size must be set to 8 for file transfers.

Following the file transfer, you can use SET TERMINAL to reset these characteristics to their former values.

Problem The service node terminal characteristics are set up incorrectly.

Correction Refer to the service node or PC documentation for information about setting up characteristics for file transfers. For example, on a VAX/VMS (V4.0) service node, use the following command to set up the characteristics (the command here is continued to a second line):

```
$ SET TERMINAL /PASSALL/NOHOSTSYNC/NOTTSYNC/NOBROADCAST -  
_ $ /EIGHTBIT/NOWRAP
```

4.4 Problems Involving Service Nodes

Problems can occur which involve the interaction between the DECserver 100 and one or more service nodes. If the same problem appears to involve a number of service nodes and more than one server, it may be an Ethernet malfunction (refer to Section 4.5). However, if the problem occurs during communication with a particular service, it is likely to be associated with a service node's hardware (including its Ethernet interface), or the service node LAT software.

A terminal user often becomes aware of service node problems when error messages appear. The messages tell why a connection cannot be established or why a service session has been terminated.

4.4.1 Message Timing Problem

An error has occurred involving the timing of messages transmitted between the DECserver 100 and a service node. One of the error messages in the following groups may appear:

```
Local -201- Connection to name not established
           No response within timeout period
```

```
Local -206- Connection to name terminated
           No response within timeout period
```

Problem The service node exceeded a timeout limit.

Correction Attempt to reconnect to the service. This condition usually means that the service node has crashed, or is otherwise unreachable. You can check its status by entering the SHOW NODES command with the node name. Report the problem to the system manager of the service node.

```
Local -224- Connection to name not established
           Circuit timer out of range
```

```
Local -264- Connection to name terminated
           Circuit timer out of range
```

Problem The server circuit timer value is out of the range specified by the service node's system manager.

Correction Determine the correct circuit timer range. Enter the SET SERVER CIRCUIT TIMER command to reset the timer value (refer to Section 2.4.1). If this solves the problem, enter the new timer value with DEFINE SERVER CIRCUIT TIMER. This command places the new value in the permanent database.

4.4.2 LAT Protocol Errors

A service node or the DECserver 100 detected messages that violate the LAT protocol. An error message in the following groups may appear:

Local -202- Connection to *name* not established
Communication protocol error

Local -207- Connection to *name* terminated
Communication protocol error

Problem A protocol error occurs in a message received from a service node. A connection attempt fails, or an existing session terminates.

Correction Attempt to reconnect to the service. This condition indicates a possible problem with the LAT software on the service node. Report the problem to the system manager of the service node.

Local -226- Connection to *name* not established
Invalid message or slot received

Local -266- Connection to *name* terminated
Invalid message or slot received

Problem The service node is receiving DECserver 100 messages that violate the LAT protocol.

Correction Try the CONNECT command again. If the connection to the service fails, initialize the server again to down-line load the server software. If the error messages appear again for CONNECT, there may be a hardware problem affecting the random access memory (RAM). Refer to Section 4.6 for information about Digital services to assist you further.

4.4.3 Group Codes Mismatch

The following messages at a terminal may indicate a group codes mismatch.

Local -711- Service *name* not known

Local -716- Access to service *name* denied

Problem Service node group codes do not match the group codes for the terminal.

Correction Confirm the mismatch by entering the SHOW SERVICES *service-name* command at the terminal. If the service node does not appear in the display, the group codes do not match.

Determine the group codes that are in effect for the service node. Then adjust the group codes for the terminal as described in Section 2.5.1.

4.4.4 Service Node Software Not Running

One of the following error messages may appear:

Local -711- Service *name* not known

Local -715- Service *name* not currently available

Problem The LAT service node software is not running on any service node offering the service.

Correction Ask the system manager of a node that offers the service to restart the service node software. The *DECserver 100 Terminal Server Software Installation Guide* and the *LAT Network Manager's Guide* contain details about the procedure.

4.4.5 Service Node Not Available

The following message may appear when a terminal user tries to connect to a service:

```
Local -715- Service name not currently available
```

Problem A service node has shut down either normally or due to a system crash. Enter the SHOW NODES ALL command to determine if the service node has “unreachable” status.

Correction Attempt to connect again to the service. If other service nodes offer the service, the DECserver 100 establishes a session. If no session is established, contact the system manager of the nonoperational service node.

4.5 Problems Involving the Ethernet

Section 3.2.1 contains guidelines for monitoring the Ethernet using the SHOW COUNTERS display. The SHOW COUNTERS data is your primary tool for detecting Ethernet problems. However, down-line load or up-line dump failures also indicate possible Ethernet problems.

Problem The counters listed on the right hand column of the SHOW COUNTERS display exceed guidelines.

Or Message 915 (console terminal only) indicates that a transmission failed after several attempts during a down-line load or up-line dump.

Or Down-line loads or up-line dumps fail intermittently.

Correction Use the privileged LOOP command to test the circuits between the DECserver 100 and any node on the Ethernet. The command syntax is discussed in detail in Chapter 5. The server software displays either message 512 or 513 on your terminal to indicate whether this loop-back test succeeds or fails. If the test fails, coordinate with your network manager to resolve the Ethernet problem.

Ask the system manager of the load host to check the load host's Ethernet counters. If the counters indicate a possible Ethernet problem, the system manager can use the NCP LOOP CIRCUIT command to test the Ethernet between the load host and the DECserver 100. If the test is unsuccessful, contact the network manager.

4.6 Digital Service

The hardware and software service options available from Digital are described in the *DECserver 100 Terminal Server Site Preparation/Hardware Installation Guide*. One hardware option and one software option are in effect for your DECserver 100 system. Contact your Digital sales representative for more information.

4.6.1 Before You Contact Digital

To help insure a prompt solution to your problem, do the following before you contact Digital:

- Perform any troubleshooting procedures described in this chapter. If possible be sure to use a console terminal while performing troubleshooting procedures. A console terminal provides much more information about the trouble than would otherwise be the case.
- Write down your server's serial number, its software version number, and the information on the ECO Status label.
- If possible make a note of what activity was taking place when the server failed. Also, be prepared to describe the troubleshooting steps you took and any results these steps produced.

4.6.2 Repackaging the Server for Shipment

If you return the DECserver 100 to Digital for repair or replacement, repack the unit properly. If possible you should use the original shipping carton and packaging material.

4.6.3 Forwarding Up-line Dump Data

If a fatal bugcheck (message 913) caused an up-line dump of the server memory image (see Section 4.2.5), send the dump file to Digital. Copy the file to 1600 bpi magtape, a TU58 cartridge, or an RX01 or RX02 diskette. Indicate the format of the copy (BACKUP, FLX, etc.) on the media. Forward the data to the address available from your Digital representative.

5

DECserver 100 Command Descriptions

This chapter is an alphabetical reference of all DECserver 100 commands. Chapters 2 and 3 provide guidelines for using some of the commands and for setting various characteristics.

In the syntax for DECserver 100 commands, a keyword is a word that appears in uppercase letters. A parameter is an optional part of the syntax. A value is a number or word that you specify. The preface discusses the conventions used in the commands' syntax.

You can enter DECserver 100 commands in either uppercase or lowercase characters (or a combination of both), and command lines can be up to 132 characters in length. You can type a command line on two terminal display lines. Do not press **RET** or any other character at the end of the first terminal line. Separate the words in a command line by one or more spaces.

If you enter a command incorrectly, one of the following error messages appears:

```
Local -701- Command syntax error
Local -702- Keyword "word" not known or ambiguous
Local -703- Value invalid or out of range, "nnnnnn"
Local -704- Privileged command or option
```

Refer to Appendix A for an explanation of these error messages. Check the command syntax and reenter the command. Each of the following command descriptions has the syntax for the command it describes. It also indicates whether the entire command requires privileged status or whether individual parameters require privileged status.

The examples show the command with keywords abbreviated to three letters. If you wish, you can abbreviate keywords to fewer than three characters if the word remains unique.

“Normal Response” shows an example of the message you normally receive from the server when you enter the command. If there is no command response, the Local> prompt indicates successful execution of the command.

“Error Response” lists examples of the possible messages you can receive if the command does not execute successfully.

BACKWARDS

Use this command to resume the previous session.

The previous session is the session that appears at the bottom of the SHOW SESSIONS display.

If you have only one active session, that session resumes, and message 102 appears. If you have two active sessions, your noncurrent session resumes.

Syntax:

BACKWARDS

Example:

```
Local> BACK
```

Normal Response:

```
Local -012- METDATA session 3 resumed  
Local -102- No other session(s) active
```

Error Response:

```
Local -712- No connection established  
Local -2nn- Connection to METDATA terminated  
          termination reason text
```

BROADCAST

Use this command to send a message to other DECserver 100 terminal users.

You can specify that a particular terminal receive the message, or you can transmit to all terminals. The message appears on a destination terminal even if the terminal has a currently active service session. The message does not appear if the destination terminal is logged out, or if BROADCAST is disabled for the terminal.

Syntax:

BROADCAST { *TERMINAL number* } *message-text*
 ALL

where

TERMINAL *number* specifies the terminal that receives your message. The terminal number can be in the range 1 to 8. The message appears only at a terminal if that terminal has BROADCAST ENABLED as a terminal characteristic.

ALL specifies that the message is to be sent to all terminals on the server. This is privileged.

message-text is the text of the message. If you enclose the text in quotation marks, it is broadcast exactly as entered. If you omit the quotation marks, the message is broadcast entirely in uppercase characters. The length of the text is limited to 125 characters.

Example:

```
Local> BRO TER 7 "Now logged in"
```

This command sends the string in quotes to terminal 7.

Normal Response (at terminal 7):

```
Local -501- From terminal 2, John Jones  
Now logged in
```

Error Response:

```
Local -611- Broadcast disabled on terminal 7
```


Use this command to establish a session with a service.

Once the connection is established, you remain in service mode until you enter the local switch character, until the service terminates the connection, or until you log out from the service. If a service terminates a session, the server notifies you and returns your terminal to local mode. If the service you request is not available, you receive a message informing you of this, and the terminal remains in local mode.

If you enter only the keyword CONNECT, the DECserver 100 connects you to a preferred service, if one is specified.

If terminal *n* is a nonkeyboard device (for example, a printer), you can type CONNECT TERMINAL *n* to connect it. The device must have the terminal characteristic TYPE OTHER.

Syntax:

CONNECT [TERMINAL *number*] [SERVICE] [*service-name*]

where

TERMINAL *number* specifies the number of a nonkeyboard terminal that has its terminal characteristic, TYPE, defined as OTHER. This is privileged. In most cases the terminal number is omitted, and the terminal from which you issue the command is connected.

service-name specifies the name of a service. Service names are 1 to 16 characters in length. If you do not enter a service name, the server completes a connection to the preferred service.

Examples:

```
Local> CON SALES
Local> CON SER METDATA
Local> CON TER 2 PRINT_SERVICE
Local> CON
```

The first and second commands connect the current terminal to the services SALES and METDATA respectively. The third command connects terminal 2 to the service PRINT_SERVICE. The fourth command connects to the service specified by the PREFERRED SERVICE parameter of the DEFINE or SET TERMINAL command. If no preferred service is in effect, this command generates an error.

Normal Response:

```
Local -101- 1 other session(s) active
Local -010- Connection to METDATA established as session 2
```

Error Response:

Local -013- Continuing attempts to connect to METDATA
Local -711- Service METDATA not known
Local -714- Preferred service has not been defined
Local -715- Service METDATA not currently available
Local -716- Access to service METDATA denied
Local -718- Session limit reached
Local -719- No memory to complete operation
Local -721- Terminal must be type 'OTHER'
Local -2nn- Connection to SALES not established
rejection reason text

{ DEFINE SET } LOGIN PASSWORD

Use this command to change the login password. This is a privileged command.

The login password restricts access to all server functions. The DEFINE command alters the server's permanent database, and the change does not take effect until the next initialization procedure. The SET command alters the server's operational database. The change takes effect immediately but does not stay in effect after an initialization.

The login password is a string of 1 to 6 keyboard characters. When you type the command, a password and a verification prompt appear. Enter the same string in response to both prompts.

Syntax:

**{ DEFINE
SET } LOGIN PASSWORD**

Password> *password*

Verification> *password*

where

LOGIN indicates that the password you specify is the password required to log in the terminals that have the LOGIN characteristic enabled.

password is the LOGIN password: a string of one to six keyboard characters.

Example:

```
Local> DEF LOG PAS
Password> D4E5F6 (not echoed)
Verification> D4E5F6 (not echoed)
```

This command defines D4E5F6 as the terminal login password. The password becomes effective after the next server initialization.

Error Response:

```
Local -741- Invalid Password
Local -742- Password verification error
```

{DEFINE} PRIVILEGED PASSWORD {SET}

Use this command to change the privileged password. This is a privileged command.

The privileged password restricts access to DECserver 100 privileged commands. The DEFINE command alters the server's permanent database, and the change does not take effect until the next initialization procedure. The SET command alters the server's operational database. The change takes effect immediately but does not stay in effect after an initialization.

The privileged password is a string of 1 to 6 keyboard characters. When you type the command, a password and a verification prompt appear. Enter the same string in response to both prompts.

Syntax:

**{DEFINE} PRIVILEGED PASSWORD
{SET}**

Password> *password*

Verification> *password*

where

PRIVILEGED indicates that the password you specify is the password required to gain access to privileged commands.

password is the **PRIVILEGED** password: a string of one to six keyboard characters.

Example:

```
Local> DEF PRI PAS
Password> A1B2C3 (not echoed)
Verification> A1B2C3 (not echoed)
```

This command defines A1B2C3 as the privileged password. The password becomes effective after the next server initialization.

Error Response:

```
Local -741- Invalid Password
Local -742- Password verification error
```

Use these commands to specify DECserver 100 characteristics. These are privileged commands.

The DEFINE command alters the server's permanent database and the changes do not take effect until the next initialization procedure. The SET command alters the server's operational database. These changes take effect immediately but do not remain in effect after an initialization.

Syntax:

```
{ DEFINE } SERVER  CIRCUI[T [TIMER] milliseconds
SET               CONSOLE { number
                           NONE
                           }
                   DUMP  { ENABLED
                           DISABLED
                           }
                   HEARTBEAT { ENABLED
                                DISABLED
                                }
                   KEEPALIVE [TIMER] secs
                   LOCATION "location"
                   LOGIN  { LIMIT number
                           NOLIMIT
                           }
                   NAME "server-name"
                   NUMBER number
                   SOFTWARE "filename"
```

where

| | |
|---------------|---|
| CIRCUIT TIMER | specifies the interval between messages sent from the DECserver 100 to service nodes. The value can range from 30 to 200 milliseconds. A short circuit timer value minimizes user response time, but maximizes service node loading. The default is 80, and this is recommended. Do not SET this parameter while any sessions are active. |
| CONSOLE | designates one DECserver 100 terminal as the console terminal. The console is used for status displays and for troubleshooting functions. The default is terminal number 1. |
| DUMP | Specifies whether up-line dumping of server memory is performed when a fatal bugcheck occurs. The default is ENABLED. |

| | |
|-----------------|---|
| HEARTBEAT | specifies whether the server checks collision detection circuitry. You should enable HEARTBEAT for error free operation with all Digital transceivers. However, certain other transceivers do not support collision detection. For these transceivers, specify DISABLED to ignore heartbeat errors on all message transmissions. The default is ENABLED. |
| KEEPALIVE TIMER | specifies the interval between messages for circuits on which no data is being transmitted. The value can range from 10 to 180 seconds. The default is 20 and this is recommended. Do not SET this parameter while any sessions are active. |
| LOCATION | specifies the location of the server. The location is transmitted by the server to service nodes in LAT messages. Enter a string of 1 to 16 keyboard characters enclosed in quotation marks (""). The default is spaces. Do not SET this parameter while any sessions are active. (Note that the keyword LOCATION can be abbreviated to no fewer than 5 characters. See the example below.) |
| LOGIN LIMIT | specifies the permitted frequency of login attempts at any terminal attached to the DECserver 100. The frequency is expressed in attempts per minute. The range is 0 to 250 and the default is 3. |
| NAME | specifies a name for the server. This name is useful for identifying the server and is transmitted by the server to service nodes in LAT messages. Enter a string of 1 to 16 keyboard characters enclosed in quotation marks (""). The default is "DECserver 100". Do not SET this parameter while any sessions are active. |
| NUMBER | specifies a number for the server. This number is useful for identifying the server, and is transmitted by the server to service nodes in LAT messages. Use a value in the range 0 to 32767. The default is 0. Do not SET this parameter while any sessions are active. |
| SOFTWARE | specifies the file name of the server software load image. During initialization the image is down-line loaded from a load host to the server. The file name is 0 to 9 characters enclosed in quotation marks (""). The default is PS0801ENG. Refer to the <i>DECserver 100 Terminal Server Software Installation Guide</i> for more details. |

Examples:

```
Local> DEF SER NAME "SALES-4" LOCAT "TECH SALES"  
Local> SET SER CIR 60 KEE 30
```

The first example defines a permanent name and location for the server. The second command reassigns values for its circuit timer and keepalive timer; values that remain in effect only until the server is next initialized.

Error Response:

```
Local -728- Parameter cannot be modified with connection establish  
Local -730- Parameter cannot be modified - try again
```

$\left\{ \begin{array}{l} \text{DEFINE} \\ \text{SET} \end{array} \right\} \text{TERMINAL}$

Use these commands to specify terminal characteristics.

The **DEFINE** command alters a terminal's characteristics in the server's permanent database. These changes do not take effect until the next login for the terminal. The **SET** command alters the terminal's characteristics in the server's operational database. These changes take effect immediately, but revert to the permanent characteristics at the next login.

With privileged status you can change the characteristics of any terminal or all the terminals. With nonprivileged status you can only change the characteristics of the terminal you are using.

Syntax:

$$\left\{ \begin{array}{l} \text{DEFINE} \\ \text{SET} \end{array} \right\} \left[\text{TERMINAL} \left\{ \begin{array}{l} \text{number} \\ \text{ALL} \end{array} \right\} \right] \text{AUTOBAUD} \left\{ \begin{array}{l} \text{ENABLED} \\ \text{DISABLED} \end{array} \right\}$$

$$\text{AUTOCONNECT} \left\{ \begin{array}{l} \text{ENABLED} \\ \text{DISABLED} \end{array} \right\}$$

$$\text{BACKWARD} [\text{SWITCH}] \left\{ \begin{array}{l} \text{character} \\ \text{NONE} \end{array} \right\}$$

$$\text{BROADCAST} \left\{ \begin{array}{l} \text{ENABLED} \\ \text{DISABLED} \end{array} \right\}$$

$$\text{CHARACTER} [\text{SIZE}] \left\{ \begin{array}{l} 7 \\ 8 \end{array} \right\}$$

$$\text{DEDICATED} [\text{SERVICE}] \left\{ \begin{array}{l} \text{service-name} \\ \text{NONE} \end{array} \right\}$$

$$\left[\begin{array}{l} \text{INPUT} \\ \text{OUTPUT} \end{array} \right] \text{FLOW} [\text{CONTROL}] \left\{ \begin{array}{l} \text{ENABLED} \\ \text{DISABLED} \end{array} \right\}$$

$$\text{FORWARD} [\text{SWITCH}] \left\{ \begin{array}{l} \text{character} \\ \text{NONE} \end{array} \right\}$$

$$\text{GROUP} [\text{CODES}] \left\{ \begin{array}{l} \text{code-list} \\ \text{ALL} \end{array} \right\} \left\{ \begin{array}{l} \text{ENABLED} \\ \text{DISABLED} \end{array} \right\}$$

$$\text{LOCAL} [\text{SWITCH}] \left\{ \begin{array}{l} \text{character} \\ \text{NONE} \end{array} \right\}$$

$$\text{LOGIN} \left\{ \begin{array}{l} \text{ENABLED} \\ \text{DISABLED} \end{array} \right\}$$

$$\text{LOSS} [\text{NOTIFICATION}] \left\{ \begin{array}{l} \text{ENABLED} \\ \text{DISABLED} \end{array} \right\}$$

MESSAGE [CODES] { ENABLED
 DISABLED }
 NAME "*terminal-name*"
 PARITY { ODD
 EVEN
 NONE }
 PREFERRED [SERVICE] { *service-name*
 NONE }
 SESSION { LIMIT *number*
 NOLIMIT }
 [INPUT
 OUTPUT] SPEED *speed*
 TYPE { ANSI
 HARDCOPY
 OTHER
 SOFTCOPY }
 USERNAME "*username*"
 VERIFICATION { ENABLED
 DISABLED }

where

- TERMINAL { *number*
 ALL } specifies which terminal(s) the command affects. This is a privileged parameter. You can enter a particular terminal number, or you can specify all the terminals by typing ALL. A nonprivileged user enters the command without this parameter and the command affects only the terminal he or she is using.
- AUTOBAUD enables the server to automatically detect the following terminal characteristics: speed, parity, and character size. The server sets its terminal port characteristics to those values it detects. The default is ENABLED. This parameter is privileged.
- AUTOCONNECT allows the server to automatically connect the terminal to a service. In the absence of a dedicated or preferred service, AUTOCONNECT operates only upon abnormal termination of a connection, or upon failure to establish a requested connection. With a dedicated service or preferred service and AUTOCONNECT ENABLED, a connection is automatically made to the service when the terminal user logs in. The default for AUTOCONNECT is DISABLED.
- BACKWARD SWITCH specifies a switch character that allows you to directly resume your previous session. BACKWARD SWITCH performs the same function as the BACKWARDS command without the requirement to reenter local mode. The default is NONE.

| | |
|--|---|
| BROADCAST | specifies whether the terminal receives messages sent from other terminals. ENABLED permits reception. The default is ENABLED. |
| CHARACTER SIZE | specifies the number of bits in data characters exchanged between the terminal and the server. Permissible values are 7 and 8. The default is 8. |
| DEDICATED SERVICE | enables the terminal, when logged in, to be connected permanently to a single service. This configuration simulates a direct, local interface between the terminal and a service node. Local mode is inoperable when a DEDICATED SERVICE is specified, and AUTOCONNECT is automatically ENABLED. The default is NONE. This is privileged. |
| <div>[INPUT] [OUTPUT]</div> FLOW CONTROL | specifies whether the terminal recognizes special characters that temporarily inhibit the transfer of data between terminal and server. FLOW CONTROL affects flow control in both directions. Enter INPUT or OUTPUT if you want flow control in one direction and not the other. INPUT specifies whether the terminal recognizes flow control characters sent from the server. OUTPUT specifies whether the terminal transmits flow control characters to the server. The default for all options is ENABLED. |
| FORWARD SWITCH | specifies a switch character that allows you to directly resume your next session. FORWARD SWITCH performs the same function as the FORWARDS command without the requirement to reenter local mode. The default is NONE. |
| GROUP CODES | specifies groups consisting of service nodes and terminals. The terminal must be in the same group as a service node to have access to the node. You can specify group codes in the range 0 to 127. To modify the code list, enter group numbers separating each by a comma (,); a hyphen (-) between two numbers denotes a range of groups (see the example below). Enter ENABLED to provide access to the nodes in the code list. Enter DISABLED to inhibit access to those nodes. The default is group code 0 ENABLED. This is privileged. |
| LOCAL SWITCH | specifies a switch character that you can use to reenter local mode from service mode. Choose any terminal keyboard character. The default is NONE. You can always use the (BREAK) key to enter local mode. |
| LOGIN | specifies whether users must enter a password to gain access to their terminals and to server functions. If LOGIN is disabled, access is not restricted. If LOGIN is enabled, a password is required. The default is DISABLED. This parameter is privileged. |

| | |
|---------------------------------------|---|
| LOSS NOTIFICATION | specifies whether you are alerted that a typed character is lost due to data error or overrun. If enabled, the server transmits a BEL character (an audible beeping sound) for each character that you must reenter. The default is ENABLED. |
| MESSAGE CODES | specifies whether message codes appear with status and error messages. Message codes are 3-digit numbers used to categorize messages. The default is ENABLED, which permits the codes to appear. |
| NAME | defines a terminal name of 0 to 12 keyboard characters. Enclose the name in quotation marks (""). Use the name, for example, to identify the normal terminal user or the terminal's location. The default is no name. This is privileged. |
| PARITY | specifies the terminal parity. The legal parity types are ODD, EVEN, or NONE. The default is NONE. |
| PREFERRED SERVICE | specifies a preferred network service. When you log in or enter CONNECT without specifying a service name, the server attempts a connection to the preferred service. With a preferred service, you can enter local mode at any time. The default is NONE. (See AUTO-CONNECT.) |
| SESSION LIMIT | limits the number of permitted service sessions. You can specify a value from 0 to 4. NOLIMIT permits four sessions and the default is 4. This is privileged. |
| <div>[INPUT OUTPUT]</div> SPEED | specifies the terminal speed in bits per second. Permissible values are 75, 110, 134, 150, 300, 600, 1200, 1800, 2000, 2400, 4800, 9600, and 19200. Specify INPUT or OUTPUT if you want the input and output speeds to be different. The input speed is the speed from the terminal to the server. The output speed is the speed from the server to the terminal. The default for all options is 9600 bps. |
| TYPE | specifies the terminal type. Specify one of four types, as follows: <ul style="list-style-type: none"> • ANSI – for use with video terminals that support ANSI escape sequences. The delete key erases deleted characters from the screen, and moves the cursor one character to the left. The screen clears before all terminal displays, and the displays build downward line-by-line from the top of the screen. Terminals in the Digital VT100 and VT200 series can be set up as type ANSI. • HARDCOPY – for use with paper-output terminals. The delete key echoes deleted characters between backslashes (\). The Digital LA120 is an example of a hardcopy terminal. |

- **OTHER** – for use with noninteractive terminals (for example, output-only printers). DECserver 100 commands cannot be entered at TYPE OTHER terminals, and DECserver 100 messages are not displayed. The Digital LA50 is an example of a type OTHER terminal. OTHER is a privileged value for TYPE.
- **SOFTCOPY** – for use with video terminals. The delete key functions as in ANSI terminals. All server displays build upward line-by-line from the bottom of the screen. The Digital VT52, for example, is a softcopy terminal.

The default type is **HARDCOPY**.

USERNAME

specifies a user name of 1 to 12 keyboard characters. Normally, you type a user name when you log into the terminal. However, you can specify it with this parameter. The user name characteristic is entered only in the server's operational database, and you can specify it only with the **SET TERMINAL** command. The default is the value for the terminal's **NAME** characteristic.

VERIFICATION

specifies whether the server sends informational messages when you connect, disconnect, or switch sessions. **DISABLED** inhibits informational messages, **ENABLED** permits display of the messages. This command does not affect error and warning messages. The default is **ENABLED**.

Examples:

```
Local> DEF TER 2 FOR @ LOC % BACK $ SPE 4800
Local> SET TER 8 GRO COD 1,2,6-19,25 ENA SES LIM 3
Local> DEF AUTOC ENA PRE DEVELOP
```

The first example defines the permanent switch characters and the speed for terminal 2. The options in the second example affect how terminal 8 can be used in service mode, and are in effect only until the terminal is logged out. In the third example, a preferred service is permanently assigned to the terminal.

Use this command to terminate sessions.

If you enter only the keyword DISCONNECT, the server disconnects your current session (the session at the top of the SHOW SESSIONS list).

Specify a terminal number in the privileged DISCONNECT command when you wish to disconnect a nonkeyboard device. The device must have the terminal characteristic TYPE OTHER.

Syntax:

```
DISCONNECT [TERMINAL number] [SESSION number]  
ALL
```

where

TERMINAL
number specifies the number of a nonkeyboard device that must have the terminal characteristic TYPE OTHER. You cannot enter the number of a “regular” interactive terminal. This is privileged.

SESSION
number specifies the session to be disconnected. If you do not specify a session, the server terminates the current session.

ALL specifies that all sessions associated with the terminal are to be disconnected.

Examples:

```
Local> DIS  
Local> DIS TER 4 SES 1  
Local> DIS ALL
```

The first command disconnects the current session for the terminal being used. The second command disconnects session 1 for noninteractive terminal 4. The third command disconnects all sessions for the terminal being used.

Normal Response:

```
Local -011- Session 1 disconnected from METDATA  
Local -014- All sessions disconnected
```

Error Response:

```
Local -712- No connection established  
Local -717- Session 1 not established  
Local -721- Terminal must be type OTHER
```

FORWARDS

Use this command to resume the next session.

The next session is the second session in the SHOW SESSIONS display list.

If you have only one active session, that session resumes, and message 102 appears. If you have two active sessions, your noncurrent session resumes.

Syntax:

FORWARDS

Example:

```
Local> FOR
```

Normal Response:

```
Local -012- METDATA session 1 resumed  
Local -102- No other session(s) active
```

Error Response:

```
Local -712- No connection established  
Local.-2nn- Connection to METDATA terminated  
          termination reason text
```

Use this command to display on-line help.

HELP displays are different for privileged and nonprivileged users. If you are using a nonprivileged terminal, only nonprivileged commands and characteristics appear.

If you enter only the keyword HELP, the server generates a display of the most frequently used commands (nonprivileged status) or the entire DECserver 100 command set (privileged status).

Syntax:

```
HELP [MORE  
      TERMINAL  
      SERVER]
```

where

| | |
|-----------------|---|
| MORE | displays additional commands (nonprivileged status only). |
| TERMINAL | displays the syntax for entering terminal characteristics in the SET TERMINAL and DEFINE TERMINAL commands. |
| SERVER | displays the syntax for entering server characteristics in the SET SERVER and DEFINE SERVER commands. This is privileged. |

Examples:

```
Local> HEL  
Local> HEL TER  
Local> HEL SER
```

INITIALIZE

Use this command to reinitialize the server, perform an orderly shutdown of normal operations, and execute one of several types of diagnostic self-test. This is a privileged command.

The green light (LED) on the DECserver 100 indicates the results of the self-test. When the self-test starts, the light is turned off. When the test is completed, the light assumes one of the following states:

- On continuously; the server passed the self-test.
- Blinking; the self-test detected a nonfatal hardware error.
- Off; the self-test failed. A fatal hardware error was detected.

If the value for COUNT is greater than 1, several repetitions of the self-test occur. The light reflects the most serious error condition detected in any of the test events.

Syntax:

```
INITIALIZE [DELAY mins] [DISABLE] [DIAGNOSE { BRIEF  
                                              FULL  
                                              NORMAL } [COUNT number] LOOP]
```

and

INITIALIZE ABORT

where

| | |
|----------------|---|
| DELAY mins | delays the beginning of initialization for the specified number of minutes. The DECserver 100 prints warning messages at regular intervals to alert terminal users. The value can range from 0 to 65535. The default is 1 minute. |
| DISABLE | inhibits the CONNECT command and the AUTOCONNECT function following initialization. Enter INITIALIZE again without the DISABLE parameter to enable CONNECT and AUTOCONNECT. |
| DIAGNOSE BRIEF | executes the part of the standard self-test that is internal to the DECserver 100 unit. This parameter does not test the server's connection to the Ethernet. |
| DIAGNOSE FULL | executes an extended version of the self-test that performs an in-depth memory test. The test takes approximately 90 seconds to execute. |

| | |
|---------------------|---|
| DIAGNOSE NORMAL | executes the standard self-test. This is the default parameter. |
| COUNT <i>number</i> | allows the self-test you choose to repeat <i>n</i> times. The number <i>n</i> can range from 1 to 32767, and the default is 1. |
| LOOP | specifies that the self-test is to run indefinitely. You must remove the server's power to stop the test. |
| INITIALIZE ABORT | terminates a previously requested initialization. ABORT takes effect only if the previous initialization has not yet begun (see DELAY). |

Examples:

```
Local> INI DEL 2 DIA FULL
Local> INI ABO
```

The first command delays initialization for two minutes, and generates the nonstandard self-test to carry out an in-depth memory test. The second command aborts an initialization that has not yet taken effect.

Normal Response (on all terminals):

```
Local -699- WARNING -- Local area service ending in 2 minutes
```

LOCK

Use this command to disable your terminal and prohibit access by unauthorized users.

The LOCK command does not disconnect current service sessions. When you issue the LOCK command, the server prompts you for a password and a verification of the password. The LOCK password is a string of 1 to 6 keyboard characters.

Upon password verification the server prints a short informational message, and prompts you to reenter the password to unlock the terminal. The terminal cannot be used until you enter the correct password. When you type the correct password, the terminal is unlocked and the Local> prompt returns. If you type an incorrect password, the password prompt is reissued.

Syntax:

LOCK

Lock password> *password* (not echoed)

Verification> *password* (not echoed)

Unlock password> *password* (not echoed)

where

password is the LOCK password you choose. The password is a string of 1 to 6 keyboard characters.

Normal Response:

```
Local -019- Terminal 3 locked
```

Error Response:

```
Local -741- Invalid password
```

```
Local -742- Password verification error
```

NOTE

Remember the LOCK password. You can unlock a terminal only with the password or by logging it out from the privileged terminal.

LOGOUT

Use this command to log out a terminal.

LOGOUT logs out a terminal from the DECserver 100 and disconnects any sessions associated with the terminal. When you log in again, the server resets the terminal characteristics to those defined in its permanent database.

If you enter only the keyword LOGOUT, the command affects only the terminal you are using.

Syntax:

LOGOUT [TERMINAL *number*]

where

TERMINAL *number* specifies the terminal to be logged out. The number must be in the range 1 to 8. This parameter is privileged.

Example:

```
Local> LOG TER 1
```

The command logs out terminal 1, and disconnects all service sessions for the terminal.

Normal Response (on the logged out terminal):

```
Local -020- Logged out terminal 1
```

LOOP

Use this command to test the physical connections between the server and another node on the Ethernet. This is a privileged command. The server transmits a message indicating whether the test is successful.

The nodes in the loop test need not be service nodes. Also, the command permits you to enlist the assistance of an intermediary node in testing the circuits.

Syntax:

```
LOOP address1 [ HELP { TRANSMIT  
                  RECEIVE  
                  FULL } ASSISTANT address2 ]
```

where

address1 specifies the Ethernet address of the node with which the server is attempting to communicate. The Ethernet address is a 12-digit hexadecimal number. You type the number in six groups of two digits each; separating the groups with hyphens (-).

HELP TRANSMIT indicates that the node with *address2* relays the outgoing transmission from the server to the node with *address1*.

HELP RECEIVE indicates that the node with *address2* relays the returning transmission from the node with *address1* to the server.

HELP FULL indicates that the node with *address2* relays both the outgoing and returning transmissions between the node with *address1* and the server.

ASSISTANT *address2* specifies the Ethernet address of the node that supports the TRANSMIT, RECEIVE, or FULL assist.

Examples:

```
Local> L00 10-1F-23-43-1A-00 HEL TRA ASSIST AA-00-01-43-1A-00  
Local> L00 10-1F-23-43-1A-00
```

The first command causes the server to transmit a signal to the node with Ethernet address 10-1F-23-43-1A-00. The outgoing transmission is relayed by an assistant node with address AA-00-01-43-1A-00. In the second example, the test transmission goes directly to node 10-1F-23-43-1A-00 without assistance.

Normal Response:

```
Local -512- Loop test successful  
Local -513- Loop test failure
```

MONITOR COUNTERS

Use this command to provide a continuously updated SHOW COUNTERS display. This is a privileged command. You can use it to monitor traffic through the terminal server. Stop the display by typing any character. The local prompt then appears.

Syntax:

MONITOR [COUNTERS]

Example:

```
Local> MON
```

NOTE

If your terminal is a video terminal that supports ANSI escape sequences, set the terminal to TYPE ANSI for the optimal display of the MONITOR command.

RESUME

Use this command to resume a session from local mode.

If no sessions are in effect, you receive an error message. If you terminate a service session with DISCONNECT, the RESUME command does not restart the session.

Syntax:

RESUME [SESSION] *number*

where

number indicates the service session you wish to restart. Obtain session numbers by entering the SHOW SESSIONS command. By entering RESUME with no *number*, the server resumes the top session in the SHOW SESSIONS display list.

Example:

```
Local> RES
Local> RES SES 3
```

The first command restarts the current session established for this terminal. The second command activates session 3 in the SHOW SESSIONS list.

Normal Response:

```
Local -012- SALES session 1 resumed
```

Error Response:

```
Local -712- No connection established
Local -717- Session 3 not established
```

SET NOPRIVILEGED

Use this command to set your terminal to nonprivileged status when it is in privileged status.

Syntax:

SET NOPRIVILEGED

Example:

```
Local> SET NOP
```

SET PRIVILEGED

Use this command to set the terminal you are using for privileged operations. You can enter this command in nonprivileged status, but you must know the privileged password.

Only one terminal at a time can be privileged. By default, upon login, a terminal is nonprivileged. When you set a terminal for privileged operations, a prompt appears for you to enter the privileged password. The password is a string of 1 to 6 keyboard characters.

Syntax:

SET PRIVILEGED [OVERRIDE]

Password: *password*

where

OVERRIDE allows you to transfer the privileged status to your terminal from another terminal.

Example:

```
Local> SET PRI OVE  
Password> A1B2C3 (not echoed)
```

This command overrides the privileged status at another terminal and transfers it to the terminal you are using.

NOTE

Be sure to reset the terminal to nonprivileged after you perform any privileged operations. If a terminal is left in privileged status, unauthorized users can change passwords.

Error Response:

```
Local -741- Invalid Password  
Local -743- Another terminal already privileged
```


SHOW COUNTERS

Use this command to display counter information about messages transmitted and received by the server.

The counters represent data accumulated since the counters were last set to zero. The information under **ETHERNET COUNTERS** applies to low-level data link transmissions between the DECserver 100 and all nodes on the Ethernet. The information under **SERVER COUNTERS** applies only to communications between the server and the other nodes that implement the LAT architecture.

You can interrupt the **SHOW COUNTERS** display with **(BREAK)**. The local prompt reappears.

Syntax:

SHOW COUNTERS

Example:

LOCAL> SHO COU

Normal Response:

* ETHERNET COUNTERS *

| | | | |
|-----------------------------|---------|----------------------------|---|
| Seconds Since Zeroed: | 1223 | Excessive Collisions: | 0 |
| Bytes Received: | 1728681 | Carrier Check Failure: | 0 |
| Bytes Sent: | 789753 | Frame Too Long: | 0 |
| Frames Received: | 12891 | Heartbeat Absent: | 0 |
| Frames Sent: | 11627 | Late Collision: | 0 |
| Multicast Bytes Rcv'd: | 1781 | Data Underrun: | 0 |
| Multicast Bytes Sent: | 196 | Block Check Error: | 0 |
| Multicast Frames Rcv'd: | 178 | Framing Error: | 0 |
| Multicast Frames Sent: | 2 | Data Overrun: | 0 |
| Frames Sent, Deferred: | 12 | System Buffer Unavailable: | 0 |
| Frames Sent, 1 Collision: | 1 | User Buffer Unavailable: | 0 |
| Frames Sent, 2+ Collisions: | 0 | | |

* SERVER COUNTERS *

| | | | |
|--------------------------|-------|-------------------------|---|
| Messages Received: | 12128 | Duplicates Received: | 5 |
| Messages Transmitted: | 10846 | Illegal Messages Rcv'd: | 0 |
| Messages Re-Transmitted: | 9 | Illegal Slots Rcv'd: | 0 |
| | | Duplicate Node Count: | 0 |

Here are descriptions of the data fields in the SHOW COUNTERS display.

| | |
|----------------------------|---|
| Seconds Since Zeroed | shows the elapsed time since the counters were last set to zero. |
| Bytes Received | shows the total number of bytes contained in datagrams successfully received by the server. |
| Bytes Sent | shows the total number of bytes contained in datagrams successfully transmitted by the server. |
| Frames Received | shows the total number of datagram frames successfully received by the server. |
| Frames Sent | shows the total number of datagram frames successfully transmitted by the server. |
| Multicast Bytes Rcv'd | shows the number of bytes received by the server that were transmitted in multicast frames. |
| Multicast Bytes Sent | shows the number of bytes transmitted by the server in multicast frames. |
| Multicast Frames Rcv'd | shows the total number of multicast frames received by the server. |
| Multicast Frames Sent | shows the total number of multicast frames sent by the server. |
| Frames Sent, Deferred | shows the number of times that frame transmissions by the server were deferred during the initial transmission attempt. |
| Frames Sent, 1 collision | shows the number of times that a frame was successfully transmitted by the server on the second attempt after a collision during the first attempt. |
| Frames Sent, 2+ collisions | shows the number of times that a frame was successfully sent by the server after collisions during the first two or more attempts. |
| Excessive Collisions | shows the number of times a message transmission was aborted due to 16 successive collisions. |
| Carrier Check Failure | shows the number of times the Ethernet carrier signal was lost during a transmit. |
| Frame Too Long | shows the number of times a frame was received with the byte count greater than 1518 bytes (the maximum allowed by Ethernet). |

| | |
|---------------------------|--|
| Heartbeat Absent | shows the number of times that no heartbeat signal was detected when the server characteristic HEARTBEAT was enabled. |
| Late Collision | shows the number of times a collision occurred after the Ethernet slot time elapsed. |
| Data Underrun | shows the number of times the server hardware failed to transmit because it was unable to keep up with the data rate. |
| Block Check Error | shows the number of times a received frame failed the CRC data integrity check. |
| Framing Error | shows the number of times a frame was received with one or more incomplete bytes. |
| Data Overrun | shows the number of times server hardware lost an incoming frame because it was unable to keep up with the data rate. |
| System Buffer Unavailable | shows the number of times no system buffer was available in the server for an incoming frame. |
| User Buffer Unavailable | shows the number of times no user buffer was available in the server for an incoming frame which passed through the system buffer. |
| Messages Received | shows the number of LAT messages successfully received by the server. |
| Messages Transmitted | shows the number of LAT messages successfully transmitted by the server. |
| Messages Re-Transmitted | shows the number of LAT messages that the server re-transmitted because they were not acknowledged by the service nodes. |
| Duplicates Received | shows the number of LAT messages that the server received more than once. |
| Illegal Messages Rcv'd | shows the number of LAT messages with an illegal format received by the server. |
| Illegal Slots Rcv'd | shows the number of LAT messages with an illegal slot format received by the server. |
| Duplicate Node Count | shows the number of times a service node became available with different Ethernet addresses. |

SHOW NODES

Use this command to display information about the service nodes in the server database.

Nodes are authorized or unauthorized depending upon group code access. They are reachable or unreachable depending upon whether they currently accept connections from DECserver 100 terminals.

You can interrupt a SHOW NODES display with **(BREAK)**. The local prompt reappears.

Syntax:

```
SHOW NODES [ node-name
              ALL
```

where

node-name specifies the service node for which information is displayed. If you do not enter a node name, information appears for all authorized service nodes with REACHABLE or UNKNOWN status. If you enter a node name, you receive a display with more detailed data about the specified node. The counters in this display apply to messages exchanged between the DECserver 100 and the specified service node.

ALL displays information for authorized nodes that are REACHABLE, UNKNOWN, or currently UNREACHABLE. For the privileged SHOW NODES ALL command, all nodes appear, whatever their status, that are authorized for at least one of the DECserver 100 terminals.

Examples:

```
Local> SHO NOD ALL
Local> SHO NOD SALES
```

The first command produces information about all service nodes that are REACHABLE, UNREACHABLE, or UNKNOWN. The second command generates detailed information about the service node SALES.

Normal Response (for the SHOW NODES ALL command):

| Node Name | Status | Announcement |
|-----------|--------------|--------------------------------|
| HDWENG | Reachable | HDWENG -- Hardware Engineering |
| METDAT | Unreachable | METDAT -- Weather Data |
| SALES | 32 Connected | SALES -- VAX 11/780 System |

Normal Response (for SHOW NODE SALES):

```
SALES                32 Connected    SALES -- VAX 11/780 System
Physical Address: AA-00-01-2C-1E-01 Seconds Since Zeroed:  71289
Messages Received:      178762 Duplicates Received:      77
Messages Transmitted:   202827 Illegal Messages Rcv'd:    0
Messages Re-transmitted:  91 Illegal Slots Rcv'd:         0
                        Duplicate Node Count:             0
```

The data fields in the SHOW NODES listings contain the following information.

| | |
|-------------------------|--|
| Node Name | lists the name of the service node as defined in the server's node database. |
| Status | shows the current reachability status of the service node: <ul style="list-style-type: none">• Reachable – indicates that no sessions are active, but the service node is accessible.• Unreachable – indicates that communication with the service node has been inactive for more than 30 minutes, or an active service session has timed out. The node may also specifically signal that it is unreachable.• <i>nn</i> Connected – shows that <i>nn</i> sessions with this node are currently active, and that the node is reachable.• Unknown – indicates that no sessions are active, and that the node has not been heard from recently. |
| Announcement | gives a brief description about the service node as entered by the system manager. |
| Physical Address | lists the Ethernet address of the service node. |
| Messages Received | lists the number of LAT messages successfully received by the server. |
| Messages Transmitted | lists the number of LAT messages successfully transmitted by the server. |
| Messages Re-transmitted | lists the number of LAT messages that the server re-transmitted because they were not acknowledged by the service node. |
| Duplicates Received | shows the number of LAT messages that the server received more than once. |

| | |
|-------------------------------|--|
| Illegal Messages Rcv'd | shows the number of LAT messages with an illegal format received by the server. |
| Illegal Slots Rcv'd | shows the number of LAT messages with an illegal slot format received by the server. |
| Duplicate Node Count | shows the number of times a service node became available with different Ethernet addresses. |

Use this command to display information about the DECserver 100.

The command displays server characteristics that are stored in the server's permanent and operational databases. The characteristics enclosed in parentheses are those in the permanent database. These values do not take effect until the next server initialization.

The keyword **SERVER** in this command can be abbreviated to no fewer than five characters (see the example below).

You can interrupt a **SHOW SERVER** display with **BREAK**. The local prompt reappears.

Syntax:

SHOW SERVER

Example:

Local> SHD SERVE

Normal Response (for nonprivileged **SHOW SERVER**):

| | | | |
|------------------|-------------------|---------|-------------------|
| Address: | AA-00-03-49-F1-00 | Uptime: | 25 13:14:52 |
| Name: | Marketing Pod | | (Marketing Pod) |
| Location: | BLDNG 4, SECT 2 | | (BLDNG 4, SECT 2) |
| Software: | PS0801ENG | | (PS0801ENG) |
| Number: | 175 | | (175) |
| Circuit Timer: | 80 | | (80) |
| Keepalive Timer: | 20 | | (20) |
| Console Port: | 1 | | (1) |
| Login Limit: | 3 | | (3) |
| Dump: | ENA | | (ENA) |
| Heartbeat: | ENA | | (ENA) |

Load Host: AA-00-03-F3-C1-05 METDAT

Normal Response (for privileged SHOW SERVER command):

```
Address:  AA-00-03-49-F1-00      Uptime:    5 17:58:29
Name:      Marketing Pod         (Marketing Pod)
Location:  BLDNG 4, SECT 2       (BLDNG 4, SECT 2)
Software:  PS0801ENG             (PS0801ENG)
Number:    175                   ( 175)
Circuit Timer:  80               ( 80)
Keepalive Timer: 20              ( 20)
Console Port:  1                 (1)
Login Limit:  3                  ( 3)
Dump:        ENA                 (ENA)
Heartbeat:    ENA                 (ENA)

Server Status:  00 0000          00 00 00 00 00 00 00 00
Software Status: PC=00204E, SP=01FED2, SR=002500, MEM=000000, CODE=004
Dump Host:  AA-00-04-00-CD-10
Load Host:  AA-00-03-F3-C1-05  METDAT
```

The fields that can be specified by DEFINE SERVER and SET SERVER are discussed in the command descriptions for those commands. Here is a description of the other data fields in the SHOW SERVER listing:

Uptime shows the time since the last server initialization. A 3-digit figure indicates the number of full days of uptime. Three 2-digit figures separated by colons (:) indicate part of an additional day in hours, minutes, and seconds.

Server Status lists the following codes from left to right across the display:

- A 2-digit hardware status code. The code is nonzero if a fatal hardware error was detected during the self-test at the last initialization. This code normally does not appear unless the error is intermittent.
- A 4-digit code of ones and zeros that describes a nonfatal hardware error.
- A series of eight 2-digit codes (one code for each terminal) that describes nonfatal terminal port errors or checksum errors.

Software Status displays the word "Normal" or shows server memory data and the up-line dump host when a fatal software error has occurred.

Dump Host shows the Ethernet address of the node that received the last up-line dump of server memory.

Load Host shows the Ethernet address and node name of the node that last down-line loaded the server.

Use this command to display information about the services you are authorized to use while in service mode.

Nodes are authorized or unauthorized depending upon group code access. If at least one authorized node offers a particular service, then you can use that service.

Entering only the keywords SHOW SERVICES generates a one-line-per-service display. The information includes service name, status, and service announcement. Only those services with AVAILABLE or UNKNOWN status are included.

You can interrupt a SHOW SERVICES display with **(BREAK)**. The local prompt reappears.

Syntax:

```
SHOW SERVICES [ service-name
                ALL
            ]
```

where

service-name displays a list of all nodes that supply the specified service. Included in the display are each node's reachability status, service announcement, and rating for dynamic load balancing.

ALL generates a one-line-per-service display. The information is similar to that with SHOW SERVICES except that services with UNAVAILABLE status are also included. The privileged SHOW SERVICES ALL command lists all services, whatever their status, that are authorized for at least one of the DECserver 100 terminals.

Examples:

```
Local> SHO SER ALL
Local> SHO SER DEVELOP
```

The first command lists all services on the Ethernet. The second command produces information about the service nodes offering the specific service DEVELOP.

Normal Response (for SHOW SERVICES ALL):

| Service Name | Status | Announcement |
|--------------|-------------|----------------------|
| DEVELOP | Available | Software Development |
| METDATA | Unavailable | Weather Information |
| SALES | Available | Monthly Sales Data |
| VMSMAIL | Available | Mail server |

Normal Response (for SHOW SERVICES DEVELOP):

Service DEVELOP – Available

| Node Name | Status | Rating | Announcement |
|-----------|-------------|--------|--------------------------------|
| HDWENG | Unknown | 62 | HDWENG -- Hardware Engineering |
| METDAT | Unreachable | 0 | METDATA -- Weather Programs |
| SALES | Reachable | 23 | SALES -- VAX 11/780 System |

Here are descriptions of the headings in the SHOW SERVICES displays.

Service Name shows the title that identifies the network service.

Node Name shows the name of the service node as defined in the database of each node that offers the service.

Service Status shows the current reachability status of the service:

- **Available** – indicates that one or more service nodes which offer the service has the status **REACHABLE**.
- **Unavailable** – indicates that none of the service nodes which offer the service is **REACHABLE** or **UNKNOWN**.
- **Unknown** – indicates that none of the service nodes which offer the service is **REACHABLE**, and one or more is **UNKNOWN**.

Node Status shows the current availability of the service node:

- **Reachable** – indicates that no sessions are active, but the service node is accessible.
- **Unreachable** – indicates that communication with the service node has been inactive for more than 30 minutes, or an active service session has timed out. The node may also specifically signal that it is unreachable.
- ***nn* Connected** – shows that *nn* sessions with this node are currently active, and that the node is reachable.
- **Unknown** – indicates that no sessions are active, and that the node has not been heard from recently.

Rating shows the relative capability for a service node to process new sessions: the higher the rating number, the greater the capability.

Announcement provides a description of the service.

Use this command to display information about your service sessions.

The command lists session number, service name, and service description. SHOW SESSIONS places the current session at the top of its display list. When you terminate a session, the session below it in SHOW SESSIONS takes its place in the display.

When you enter only the keywords SHOW SESSIONS, the server generates a list of the sessions for the terminal you are using.

You can interrupt a SHOW SESSIONS display with **BREAK**. The local prompt reappears.

Syntax:

```
SHOW SESSIONS [ TERMINAL number ]  
                ALL
```

where

TERMINAL *number* displays a list of sessions for the specified terminal.

ALL displays a list of sessions for all terminals attached to the DECserver 100.

Example:

```
Local> SHO SES TER 2
```

This command displays the session information for terminal 2.

Normal Response (for SHOW SESSIONS):

| | | | |
|--------------|----------|----------------------|---------|
| Terminal 2: | John Doe | Connected | DEVELOP |
| - Session 2: | DEVELOP | VAX 11/780 System | |
| - Session 3: | METDATA | Weather Programs | |
| - Session 4: | SALES | VAX 11/780 System | |
| - Session 1: | DEVELOP | *** Disconnected *** | |

Here the service DEVELOP, not the terminal user, ended session 4. The terminal user can still resume session 4 to determine why the service node stopped the session.

Normal Response (for SHOW SESSIONS ALL):

| | | | |
|--------------|--------------|----------------------|---------|
| Terminal 1: | John Doe | Connected | DEVELOP |
| - Session 2: | DEVELOP | VAX 11/780 System | |
| - Session 3: | METDATA | Weather Programs | |
| - Session 1: | SALES | VAX 11/780 System | |
| Terminal 3: | Richard Roe | Local Mode | |
| - Session 1: | DEVELOP | Software Development | |
| Terminal 4: | Jack Jones | Local Mode | |
| Terminal 5: | John Smith | Connected | METDATA |
| - Session 1: | METDATA | Weather Programs | |
| Terminal 6: | Mary Patrick | Local mode | |
| - Session 3: | HWDENG | Hardware Engineering | |
| - Session 1: | SALES | VAX 11/780 System | |
| Terminal 7: | Pat O'Dea | Local mode | |
| - Session 2: | METDATA | Weather Programs | |

Use this command to display information about a terminal.

This information includes the characteristics that you assign with the DEFINE and SET TERMINAL commands. SHOW TERMINAL displays the characteristics that reside in both the server's operational and permanent databases. The characteristics in parentheses are the permanent characteristics. They take effect each time the terminal user logs in.

SHOW TERMINAL commands entered at privileged and nonprivileged terminals differ slightly.

You can interrupt a SHOW TERMINAL display with **(BREAK)**. The local prompt reappears.

Syntax:

SHOW TERMINAL *number*
ALL

where

number specifies a particular terminal for which information is displayed. The number must be in the range 1 to 8.

ALL states that information for all terminals is to be included in the display.

Example:

Local> SHD TER 3

This command prints a display of information about terminal 3.

Normal Response (for nonprivileged SHOW TERMINAL):

| | | | | | |
|----------------|------|-----------|--------------------|-----------|-----------------|
| Terminal : | 3 | Pat O'Dea | Name: | Office_42 | (Office_42) |
| Autobaud: | ENA | (ENA) | Term Type: | ANSI | (ANSI) |
| Broadcast: | ENA | (ENA) | I/P Speed: | 9600 | (19200) |
| Back'd Switch: | NONE | (NONE) | O/P Speed: | 9600 | (19200) |
| Forw'd Switch: | ^X | (^X) | Char Size: | 8 | (8) |
| Local Switch: | % | (%) | Parity | NONE | (NONE) |
| Login: | ENA | (ENA) | Stop Bits: | 1 | (1) |
| Loss Notif'n: | ENA | (ENA) | Verificat'n: | ENA | (ENA) |
| | | | | | |
| Autoconnect: | ENA | (ENA) | Preferred Service: | RSCH | (RSCH) |
| Session Limit: | 4 | (4) | Current Session | 2 | Service: BERGIL |

Normal Response (for privileged SHOW TERMINAL):

```
Terminal : 1   John Doe      Name:   Office_42          (Office_42)
Autobaud:      ENA   (ENA) Term Type: SOFT   (SOFT)   I/P Flow Ctl: ENA (ENA)
Broadcast:     ENA   (ENA) I/P Speed: 9600   (9600)   I/P Off:   ^S On: ^Q
Back'd Switch: NONE (NONE) O/P Speed: 9600   (9600)   O/P Flow Ctl: ENA (ENA)
Forw'd Switch: ^X    (^X) Char Size: 8       (8)      O/P Off:   ^S On: ^Q
Local Switch:  !     (!) Parity:  NONE      (NONE)   Framing Errors:  0
Login:         ENA   (ENA) Stop Bits:  1      (1)     Parity Errors:   0
Loss Notif'n:  ENA   (ENA) Verificat'n: ENA   (ENA)   Overrun Errors:  0

Autoconnect:   ENA   (ENA) Preferred Service: NONE   (NONE)
Session Limit: 4      (4) Current Session  2      Service: SALES

Group Codes:
0-255
(0-255)
```

The fields that can be specified by the DEFINE or SET TERMINAL commands are described in that section. Here is a description of the other data fields in the SHOW TERMINAL listing:

| | |
|-----------------|--|
| I/P Off | shows the control character sent by the server to stop data currently being sent from your terminal to the server. |
| I/P On | shows the control character sent by the server to restart the flow of data from your terminal to the server. |
| O/P Off | shows the control character you enter to stop the current data output to your terminal. |
| O/P On | shows the control character you enter to restart the data output to your terminal. |
| Framing Errors | shows the number of bytes received with bad framing at the server's terminal port. |
| Parity Errors | with parity enabled, shows the number of bytes received with parity errors at the server's terminal port. |
| Overrun Errors | shows the number of characters lost because the server's input buffers were full. |
| Current Session | shows the service session in effect or the service session interrupted when the user last entered local mode. |

SHOW USERS

Use this command to display information about active server users.

The command generates a one line listing for each user. The terminal number, user name, status, and service (if connected) appear in the display. The status shows whether the user's terminal is currently in local mode, or connected to a service.

You can interrupt the SHOW USERS display by entering **BREAK** . The local mode prompt reappears.

Syntax:

SHOW USERS

Example:

```
Local> SHO USE
```

Normal Response:

| Terminal | Username | Status | Service |
|-------------|--------------|------------|---------|
| Terminal 1: | John Doe | Connected | DEVELOP |
| Terminal 3: | Richard Roe | Local Mode | |
| Terminal 4: | Jack Jones | Local Mode | |
| Terminal 5: | John Smith | Connected | METDATA |
| Terminal 6: | Mary Patrick | Local mode | |
| Terminal 7: | Pat O'Dea | Local Mode | |

STOP TEST TERMINAL

Use this command to terminate test activity generated by the TEST TERMINAL command. This is a privileged command.

If the test involved the loopback function, the result of the test appears on the privileged terminal.

Syntax:

STOP TEST TERMINAL *number*

where

number specifies the terminal for which the command terminates testing.

Example:

```
Local> STO TES TER 3
```

This command stops TEST TERMINAL activity at terminal 3.

Normal Response:

```
Local -511- Test complete 6000 bytes written, 0 error(s) detected
```

Error Response:

```
Local -732- Terminal 3 not under test
```


Use this command as a tool to test a terminal's operation.

The command generates a continuous stream of ASCII characters which are transmitted either directly to a specified terminal or to the terminal's port on the server.

If you enter only the keywords TEST TERMINAL and a terminal number, the server sends a continuous stream of characters to the terminal screen. This continues until you press any key (or BREAK) at that terminal. You also stop the test when you specify the terminal in the STOP TEST TERMINAL command.

If you enter the LOOPBACK parameter the characters go only to the terminal port and return. You must place the terminal port loopback connector in terminal port. You cannot use the LOOPBACK parameter to test the privileged terminal.

Syntax:

TEST [TERMINAL *number*] [WIDTH *number*] [COUNT *number*] [LOOPBACK]

where

| | |
|---------------------------|---|
| TERMINAL <i>number</i> | specifies the terminal where the test output appears. This is privileged. |
| WIDTH <i>number</i> | specifies the screen width of the lines of ASCII output. The width can vary between 1 and 132 characters, and the default is 72 characters. |
| COUNT <i>number</i> | specifies how many lines of ASCII characters are output. If you do not specify a number, lines appear until you stop the output. |
| LOOPBACK | determines that the test pattern is output to the terminal's port in the terminal server and looped back with an external loopback connector. The looped back data is compared with that transmitted. When the test is complete, a message appears indicating the number of errors and number of bytes transferred. This is a privileged parameter. |

Examples:

```
Local> TES TER 8 WID 32 COU 5
Local> TES
```

The first command causes terminal 8 to receive a stream of 5 lines of keyboard characters. Each line is 32 characters wide. The second command generates a continuous test output at the local terminal.

Normal Response:

```
0123456789:;<=>?@ABCDEFGHIJKLMNO  
123456789:;<=>?@ABCDEFGHIJKLMNOP  
23456789:;<=>?@ABCDEFGHIJKLMNOPQ  
3456789:;<=>?@ABCDEFGHIJKLMNOPQR  
456789:;<=>?@ABCDEFGHIJKLMNOPQRS
```

Error Response:

```
Local -731- Terminal not configured for loopback test  
Local -733- Terminal 7 already under test
```

ZERO COUNTERS

Use this command to reset the counters for the Ethernet, server, and terminals. This is a privileged command.

ZERO COUNTERS does not zero the uptime counter in the SHOW SERVER display. This is reset only after an initialization or power-up of the DECserver 100.

Syntax:

ZERO [COUNTERS]

Example:

```
Local> ZER
```



A

Status and Error Messages

This appendix describes all status and error messages issued by the DECserver 100. All messages describe the status or error in a self-explanatory sentence.

A 3-digit message code appears with each message. The message codes help categorize the messages. You can disable the codes for any terminal using the SET TERMINAL or DEFINE TERMINAL command (refer to Chapter 5). The message codes are enabled by default.

A.1 Classes and Formats of Messages

There are five classes of status and error messages. Each is distinguished by its message code series as shown in Table A-1.

Table A-1: Classes of Status and Error Messages

| Message Codes | Types of Messages |
|---------------------------|--|
| 000-099 and 500-599 | Informational messages – normal responses to user commands. |
| 100-199 and 600-699 | Warning messages – warnings about events that may not be expected or valid. |
| 200-299 | Connection error messages – reasons for terminating or not establishing service connections. |
| 700-799 | User error messages – explanations of why user commands may not be honored. |
| 900-999 | Console messages – status and error messages issued from the DECserver 100 ROM software. |

All DECserver 100 messages appear in one of two formats. If the 3-digit message codes (represented by *nnn*) are enabled, they have this format:

Local -*nnn*- *status or error message text*

If message codes are disabled, they have the following format:

Local - *status or error message text*

Message codes always appear for the 900 series of messages.

Messages with codes of 0 to 499 are intended for use with all Digital terminal servers. Messages with codes of 500 to 999 are specific for the DECserver 100.

A.2 Message Listings and Explanations

This section lists each message in its class and presents explanatory text for each listing. Italic type marks the parts of messages that vary with network and DECserver configurations. For example, *name* stands for the name of a service on a particular Ethernet.

A.2.1 Informational Messages (message codes 000–099 and 500–599)

Local -010- Connection to *name* established as session *n*

Issued following a successful connection to a service. The service name and session number are displayed. This message only appears if VERIFICATION is enabled.

Local -011- Session *n* disconnected from *name*

Issued following a normal termination of a session; for example, one terminated with the DISCONNECT command. This message only appears if VERIFICATION is enabled.

Local -012- *name* session *n* resumed

Issued following resumption of a session. The service name and session number are displayed. This message only appears if VERIFICATION is enabled.

Local -013- Continuing attempts to connect to *name*

Issued when AUTOCONNECT is enabled following an unsuccessful connect request or abnormal termination. This message follows an error message which explains the unsuccessful connection or termination. The server reissues this message if the reason for the connection failure changes.

Local -014- All sessions disconnected

Issued following a DISCONNECT ALL command.

Local -019- Terminal *n* locked

Issued following a successful LOCK command.

Local -020- Logged out terminal *n*

Issued after the terminal user enters LOGOUT, or after the terminal is logged out from the privileged terminal.

Local -501- From terminal *n*, *username*
message text

Appears at a terminal when that terminal is sent a broadcast message from another terminal. The header line includes the terminal number and user name of the sender.

Local -511- Test complete *nn* bytes written, *nn* error(s) detected

Issued following a STOP TEST TERMINAL command when a loopback test is stopped. It displays the number of bytes written/read during the test, and the number of errors or data discrepancies detected. The number of errors would normally be zero. Refer to Section 4.3 if the number of errors is nonzero.

Local -512- Loop test successful

Appears on the privileged terminal following successful execution of a LOOP command. This message indicates that the loop attempt is successful with no data corruption. Refer to Section 4.5.

Local -513- Loop test failure

Appears on the privileged terminal following an unsuccessful execution of a LOOP command. This message indicates that either the LOOP response timed out, or that the data returned in the message is corrupted. Refer to Section 4.5.

A.2.2 Warning Messages (message codes 100–199 and 600–699)

Local -101- *n* other session(s) active

Issued following a connect request if the user has at least one other session active.

Local -102- No other session(s) active

Issued following a FORWARDS command, BACKWARDS command, or switch character when only one session is active. The current session is successfully resumed.

Local -601- Internal memory error in terminal parameters
System defaults in effect

Issued during the terminal logging in sequence. The permanent parameters for this terminal are corrupted, and the factory-set defaults are in effect. Refer to Section 4.3.2.

Local -602- Internal memory error in server parameters
System defaults in effect

Issued during the terminal logging in sequence. The server's permanent characteristics are corrupted, and the factory-set defaults are in effect. Refer to Section 4.2.2.

Local -611- Broadcast disabled on terminal *n*

Appears following a broadcast command when broadcast is disabled on the specified terminal(s). The specified terminal does not receive the message.

Local -699- WARNING - Local area service ending in *n* minutes

Issued at regular intervals to all terminals following an INITIALIZE command. The server will be reinitialized in the number of minutes shown. There is no additional notice following the 1 minute message.

A.2.3 Connection Error Messages (message codes 200-299)

Local -201- Connection to *name* not established
No response within timeout period

Appears when a connect request (or autoconnect attempt) is unsuccessful. The service node did not respond within 10 seconds. The probable cause is that the service node is down. This condition causes the service node status to change to UNREACHABLE. Refer to Section 4.4.

Local -202- Connection to *name* not established
Communication protocol error

Appears when a connect request (or autoconnect attempt) is unsuccessful because of a LAT protocol error in a message sent by a service node. Refer to Section 4.4.

Local -206- Connection to *name* terminated
No response within timeout period

Appears when an existing connection is abnormally terminated because the service node does not respond within 10 seconds. The probable cause is that the service node is down. This condition causes the service node status to change to UNREACHABLE. Refer to Section 4.4.

Local -207- Connection to *name* terminated
Communication protocol error

Appears when an existing connection is abnormally terminated because of a LAT protocol error in a message sent by a service node. Refer to Section 4.4.

Local -2nn- Connection to *name* not established
rejection reason text

Appears when a connect request (or autoconnect attempt) is unsuccessful because the service node rejects the connect request. The rejection reason text explains why the node rejected the request.

Code Rejection Reason

nn = 21 Insufficient node resources
nn = 22 System shutdown in progress
nn = 23 Node user disconnect
nn = 24 Circuit timer out of range
nn = 25 Invalid service class
nn = 26 Invalid message or slot received
nn = 27 Time limit expired
nn = 28 No progress being made

For messages 224 and 226, refer to the troubleshooting procedures in Section 4.4.

Local -2nn- Connection to *name* terminated
termination reason text

Appears when an existing connection is abnormally terminated by the service node. The rejection reason text explains why the node terminated the connection.

Code Termination Reason

nn = 61 Insufficient node resources
nn = 62 System shutdown in progress
nn = 63 Node user disconnect
nn = 64 Circuit timer out of range
nn = 65 Invalid service class
nn = 66 Invalid message or slot received
nn = 67 Time limit expired
nn = 68 No progress being made

For messages 264 and 266, refer to the troubleshooting procedures in Section 4.4.

A.2.4 User Error Messages (message codes 700–799)

Local -701- Command syntax error

Issued when a command is entered incorrectly. The keyword is recognized, but the command options do not follow the correct syntax; or no command keyword is entered.

Local -702- Keyword "*word*" not known or ambiguous

Appears when a command is entered incorrectly. The keyword specified in *word* is not recognized by the server software; or not enough characters are entered to make the keyword unique.

Local -703- Value invalid or out of range, "*nnnnnn*"

Issued when a user-specified value is entered incorrectly. The value entered in *nnnnnn* is invalid or out of range.

Local -704- Privileged command or option

Issued when a nonprivileged user enters a privileged command or command option.

Local -710- Node *name* not known

Appears when the node name specified in the SHOW NODES *node-name* command is not known to the DECserver 100. Either the node name is invalid, or the node is not authorized for the user. See Section 4.4.

Local -711- Service *name* not known

Issued when the specified service name in a CONNECT *service-name* command (or autoconnect attempt) or a SHOW SERVICES *service-name* command is not known to the DECserver 100. Either the service name is invalid, or the service is not authorized for the user. See Section 4.4.

Local -712- No connection established

Appears when a DISCONNECT or RESUME command is entered, and no connection is established for the current or specified session.

Local -713- Connection already established

Issued when a CONNECT TERMINAL *n* command is entered, and a connection is already established on terminal *n*. Terminal *n* is a nonkeyboard device, and only one session may be active at nonkeyboard devices.

Local -714- Preferred service has not been defined

Appears when a CONNECT command is entered without a service name. No preferred (or dedicated) service has been set up.

Local -715- Service *name* not currently available

Issued when a CONNECT command is entered (or autoconnect attempted) and no node offering the specified service is currently reachable. See Section 4.4.

Local -716- Access to service *name* denied

Issued when a connection to a service is attempted, and the user is not authorized access to the service. The user's terminal has no group code in common with any service node that offers the service. See Section 4.4.

Local -717- Session *n* not established

Appears when a DISCONNECT SESSION *n* or RESUME SESSION *n* is entered, and session *n* does not exist.

Local -718- Session limit reached

Issued when a **CONNECT** command is issued, and the terminal already has the maximum number of sessions active. An additional session cannot be established. The session limit is defined in a privileged **SET TERMINAL** command, and can range from 0 to 4.

Local -719- No memory to complete operation

Appears when a command cannot be executed. The memory that the server reserves for storing information about services and nodes is shared with that used for additional service sessions. This memory is currently fully utilized. You can wait and try later. For a more permanent solution, define group codes so that the total number of nodes available to all terminal users is more reasonable. If 100 or fewer nodes are known to the server, there should be no resource problems. A user always has access to at least ONE session. Section 2.5.1 discusses group codes.

Local -721- Terminal must be type 'OTHER'

Issued when a privileged **CONNECT TERMINAL *n*** or **DISCONNECT TERMINAL *n*** command is entered, and terminal *n* is not **TYPE OTHER**. It is not possible to connect or disconnect interactive terminals at the privileged terminal, only nonkeyboard devices. Refer to Section 3.1.

Local -722- Server disabled

Appears when a **CONNECT** command is issued, and the server is disabled (following an **INITIALIZE DISABLE** command). Connect requests are not honored when the server is disabled. Refer to Section 2.6.

Local -723- Fatal Ethernet port error

Appears when a connect request is issued, and a fatal Ethernet port error is detected. An **INITIALIZE** from the privileged terminal (or power-up) is required to correct this condition. After initialization, refer to Section 4.2.2.

Local -728- Parameter cannot be modified with connection established

Issued when characteristics specified in a **SET SERVER** command cannot be changed while connections exist at any terminal. Wait until the terminal users end their sessions; or enter the **DEFINE SERVER** command to change the characteristics, and then the **INITIALIZE** command to make them operational.

Local -729- Parameter cannot be modified dynamically

Appears if a characteristic specified in a SET TERMINAL command cannot be modified using SET TERMINAL. Use DEFINE TERMINAL to change the characteristic. The change takes effect when the terminal user next logs in.

Local -730- Parameter cannot be modified - try again

Issued when an internal conflict in resources occurs, and a command cannot be executed. These conflicts are of brief duration. The command should be reentered.

Local -731- Terminal not configured for loopback test

Appears when the TEST TERMINAL LOOPBACK command is entered without a terminal number. You cannot loopback to your own terminal.

Local -732- Terminal *n* not under test

Issued when a STOP TEST TERMINAL *n* command is entered for a terminal *n* that does not have a test running.

Local -733- Terminal *n* already under test

Issued when you enter the privileged command TEST TERMINAL *n* for a terminal *n* that is already undergoing a test. You can stop the first test by typing STOP TEST TERMINAL *n*.

Local -741- Invalid password

Issued when one of the following happens:

- You type an invalid password in response to the SET PRIVILEGED command.
- You type a password of more than six characters when you enter these commands:
 - DEFINE PRIVILEGED PASSWORD
 - SET PRIVILEGED PASSWORD
 - DEFINE LOGIN PASSWORD
 - SET LOGIN PASSWORD
 - LOCK

Reenter the command with the correct password or password syntax.

Local -742- Password verification error

Appears for a LOCK, SET PASSWORD, or DEFINE PASSWORD command. The verification password does not match the original password. Reenter the entire command again.

Local -743- Another terminal already privileged

Issued for a SET PRIVILEGED command when another terminal is already privileged. Only one terminal can be privileged at a time. In the case of a malfunctioning terminal, the privilege can be transferred using the SET PRIVILEGED OVERRIDE command.

A.2.5 Console Messages (message codes 900–999)

These messages appear: (1) when you enter the INITIALIZE command, (2) when you power-up the DECserver, (3) when a fatal error occurs. They appear only on the console terminal, and message codes are always enabled for these messages.

Local -901- Initializing DECserver *address* - ROM BL7, H/W Rev A.A

Appears at the start of DECserver 100 initialization approximately 20 seconds after power-up or the INITIALIZE command. The message displays the following information:

- The Ethernet address, *address*, of the server
- The version number of the internal ROM software
- The current hardware revision level.

Local -902- Waiting for image load

Issued after the server sends a request-for-load to load hosts. One display of this message is normal for each initialization. However, if the load fails, or no load host volunteers, this message repeats every 30 seconds. Refer to Section 4.2.4.

Local -903- Loading from host *address*

Issued when a load host with the Ethernet address, *address*, volunteers to down-line load the server. One such message is normal for each initialization.

Local -904- Image load complete

Appears when a down-line load has successfully completed. Following this message, the LAT server software takes control of the DECserver.

Local -905- Waiting for image dump

Issued following a crash of the DECserver 100. The DUMP characteristic is enabled for the server, and the server has requested a volunteer host to perform an up-line dump. This message appears once for each up-line dump.

Local -906- Dumping to host *address*

Issued after the DECserver receives a dump volunteer and an up-line dump has started. This message appears once for each up-line dump.

Local -907- Image dump complete

Issued when the DECserver 100 has successfully completed an up-line dump. The self-test code takes control of the server.

Local -908- Resetting console terminal

Appears following a fatal bugcheck (message 913). After the fatal error, internal ROM software uses the current console terminal characteristics for status messages. Following up-line dump, the console terminal characteristics are reset to those stored in the permanent database. This message indicates when the reset occurs.

Local -910- Image load not attempted, network communication error

Issued following the self-test if an Ethernet loopback test fails during the self-test. A down-line load cannot possibly be successful, and could cause network problems. A power-up or initialization (CTRL/P) is required to clear this condition. Refer to Section 4.2.2.

Local -911- WARNING - Non-fatal hardware error detected
Server code *nnnn*, terminal codes *nn nn nn nn nn nn nn nn*

Appears if the self-test detects nonfatal hardware errors during its execution. Each code digit can be a 0 or 1; a 1 means that an error has been detected for the appropriate condition.

The number 1 at the various positions in the server code indicates the following errors:

- *1nnn* - Ethernet heartbeat error
- *n1nn* - Ethernet loopback error
- *nn1n* - Hardware revision level checksum error
- *nnn1* - Server parameters checksum error

The number 1 at either of the two positions in the terminal codes indicates the following:

- 1n – Terminal port error
- n1 – Terminal parameters checksum error

Refer to the troubleshooting procedures in Section 4.2.2.

Local -912- Load failure, timeout

Appears if a down-line load sequence is interrupted, and a load message is not received for 30 seconds. The load sequence is restarted. Refer to Section 4.2.4.

Local -913- Fatal Buscheck PC=nnnnnn, SP=nnnnnn, SR=nnnn, MEM=nnnnnn, CODE=nnn

Issued when a DECserver 100 crash occurs and is recorded in an orderly fashion. The message displays the PC, SP, and SR at the time of crash. If an address error occurs, the illegal address is displayed in MEM. The CODE gives the reason for the crash. Refer to Section 4.2.5.

Local -914- Timeout, dump aborted

Appears when a timeout condition occurs during an up-line dump, and the dump is aborted. Following this message, the diagnostic self-test executes. Refer to Section 4.2.5.

Local -915- Transmission failure after ten attempts

Issued when the load or dump protocol has to retry a single message 10 times. Refer to Section 4.5.

Local -916- Illegal load image, load aborted

Appears if the server software being down-line loaded specifies illegal sections of DECserver 100 memory. Ask the system manager of the load host to reinstall the server software and then try again to initialize the server.

Glossary

bugcheck

A process by which the DECserver 100 detects fatal errors and reinitializes.

cluster

A group of VAX computer systems operating logically as a single service node.

collision

A condition that occurs when two nodes on the Ethernet transmit at the same time.

console terminal

A DECserver 100 terminal on which the 900 series of DECserver 100 messages appears. By default, the console terminal is the terminal connected to terminal port 1 on the server.

database

An area of DECserver 100 memory that holds the terminal and server characteristics. There are two databases of this kind; the permanent database and the operational database.

failover

A feature by which the server automatically attempts a connection to another service node when a connection terminates abnormally. The server tries to connect to a service node offering the same service. AUTOCONNECT must be enabled for failover.

initialize

To start a procedure that: (1) disconnects all DECserver 100 service sessions, (2) runs the diagnostic self-test, (3) down-line loads the server software from a load host, (4) transfers control to the server software. You can initialize the server with the INITIALIZE command or by power-up.

local mode

A terminal user's environment when he or she interacts with the server using DECserver 100 commands.

nonprivileged status

An operating mode in which a terminal user has access only to the nonprivileged DECserver 100 commands.

port

The hardware on the DECserver 100 that transmits and receives data to and from a DECserver 100 terminal or the Ethernet transceiver. Server and terminal characteristics are effective at the terminal ports and at the Ethernet port.

privileged status

An operating mode in which a terminal user has access to the privileged terminal and to the privileged DECserver 100 commands. The server manager is normally the only user with privileged status.

ROM

An acronym for Read Only Memory; the part of the DECserver 100 memory where microcode instructions are stored to implement the self-test, down-line loading, up-line dumping, and maintenance messages. Unlike the server (LAT) software, instructions stored in ROM are not down-line loaded.

self-test

A diagnostic test that verifies DECserver 100 hardware components. You can specify various types of self-tests with the INITIALIZE DIAGNOSE command.

server software

The software that implements the LAT protocols on the DECserver 100.

service

A resource provided by network computer systems that is available to DECserver 100 terminal users. A service can be offered by one or more systems.

service mode

A terminal user's environment when his or her terminal is connected to a service.

service node

A computer system that provides services to a DECserver 100 terminal user.

service node software

The software that implements the LAT protocols on a service node.

session

A connection or interaction between a terminal user and a service.

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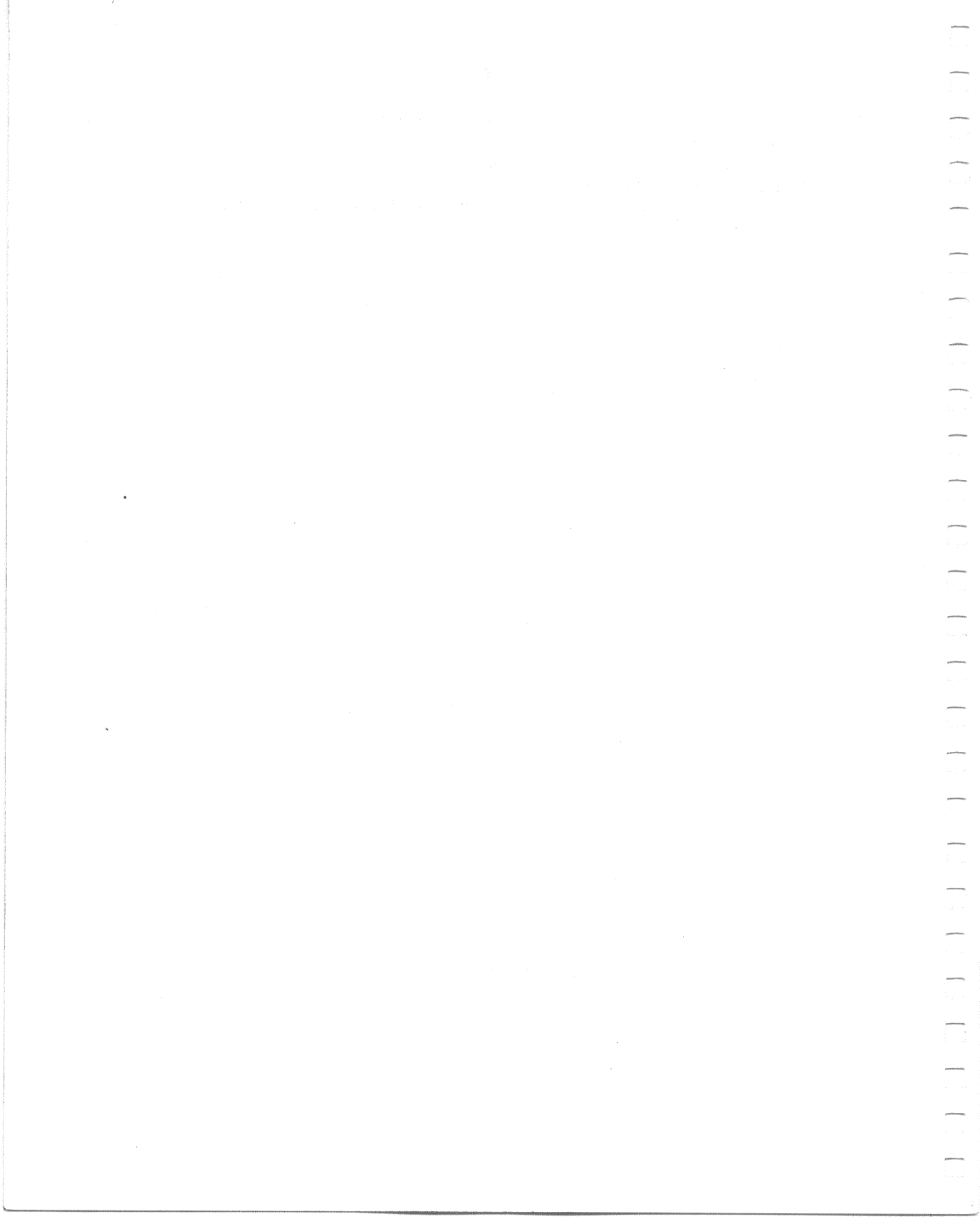
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