

VMS LAT Control Program (LATCP) Manual

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This document describes the LAT Control Program.

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Contents

PREFACE	vii
NEW AND CHANGED FEATURES	ix
LATCP Description	LAT-1
1 INVOKING AND EXITING THE UTILITY	LAT-1
2 UTILITY COMMANDS	LAT-2
3 LATCP HELP FACILITY	LAT-2
LATCP Usage Summary	LAT-3
LATCP Commands	LAT-4
CREATE LINK	LAT-5
CREATE PORT	LAT-7
CREATE SERVICE	LAT-9
DELETE PORT	LAT-11
DELETE SERVICE	LAT-12
EXIT	LAT-13
HELP	LAT-14
SET COUNTERS/ZERO	LAT-15
SET LINK	LAT-16
SET NODE	LAT-18
SET PORT	LAT-20
SET SERVICE	LAT-23
SHOW CHARACTERISTICS	LAT-25
SHOW COUNTERS	LAT-27
SHOW PORTS	LAT-31
SHOW SERVERS	LAT-33
START NODE	LAT-34
STOP NODE	LAT-36

Contents

INDEX

TABLES

LAT-1	Summary of LATCP Commands _____	LAT-2
LAT-2	LAT Node Counters _____	LAT-28
LAT-3	Protocol Error Bit Mask Definitions _____	LAT-29

Preface

Intended Audience

This manual is intended for VMS system managers.

Document Structure

This document consists of the following three sections:

- Description—Provides a brief description of the LAT Control Program Utility (LATCP), which is used to configure and control the Local Area Transport (LAT) protocol on VMS host systems.
- Usage Summary—Outlines the following LATCP information:
 - Invoking the utility
 - Exiting from the utility
 - Restrictions or privileges required
- Commands—Describes LATCP commands, including format, parameters, and examples.

Associated Documents

For an overview of the LAT protocol, see *Introduction to VMS System Management*. For information on starting a VMS service node, see *Guide to Setting Up a VMS System*.

For information on setting up queues to support remote printers on terminal servers, see *Guide to Maintaining a VMS System*.

For complete information on the Local Area Transport (LAT) architecture supported on Digital Terminal Servers, see *Local Area Transport (LAT) Network Concepts*. The guide provides information on LAT network concepts, network configurations, network performance, and network troubleshooting.

For a description of the usage and syntax of all terminal server commands and a description of error messages, see the *Terminal Server Commands and Messages Guide*.

For a discussion of setting up, managing, monitoring, and troubleshooting the various types of terminal servers, see the product specific management and operations guides for terminal server products.

Conventions

Convention	Meaning
<code>RET</code>	In examples, a key name (usually abbreviated) shown within a box indicates that you press a key on the keyboard; in text, a key name is not enclosed in a box. In this example, the key is the RETURN key. (Note that the RETURN key is not usually shown in syntax statements or in all examples; however, assume that you must press the RETURN key after entering a command or responding to a prompt.)
<code>CTRL/C</code>	A key combination, shown in uppercase with a slash separating two key names, indicates that you hold down the first key while you press the second key. For example, the key combination CTRL/C indicates that you hold down the key labeled CTRL while you press the key labeled C. In examples, a key combination is enclosed in a box.
<code>\$ SHOW TIME</code> <code>05-JUN-1988 11:55:22</code>	In examples, system output (what the system displays) is shown in black. User input (what you enter) is shown in red.
<code>\$ TYPE MYFILE.DAT</code> . . .	In examples, a vertical series of periods, or ellipsis, means either that not all the data that the system would display in response to a command is shown or that not all the data a user would enter is shown.
<code>input-file, . . .</code>	In examples, a horizontal ellipsis indicates that additional parameters, values, or other information can be entered, that preceding items can be repeated one or more times, or that optional arguments in a statement have been omitted.
<code>[logical-name]</code>	Brackets indicate that the enclosed item is optional. (Brackets are not, however, optional in the syntax of a directory name in a file specification or in the syntax of a substring specification in an assignment statement.)
quotation marks apostrophes	The term quotation marks is used to refer to double quotation marks ("). The term apostrophe (') is used to refer to a single quotation mark.

New and Changed Features

The following technical changes have been made to LATCP software for V5.0.

- Addition of the capability of operating a VMS service node over two Ethernet links. Two new LATCP commands, CREATE LINK and SET LINK, have been added to allow you to assign multiple links to your service node and to define and change link characteristics. Several LATCP commands include changes that support this new feature.
 - In the CREATE SERVICE and SET SERVICE commands, the new /LINK qualifier identifies the link over which you want a service offered. The new /[NO]DECNET qualifiers identify which Ethernet address to use.
 - In the START NODE and STOP NODE commands, the new /LINK qualifier identifies the links that you want started or stopped on a VMS service node. The new /[NO]DECNET qualifiers allow you to restrict traffic on an Ethernet link.
 - In the SET PORT command, the new /LINK qualifier identifies the link used by an applications port to access a remote device on a terminal server.
 - In the SHOW COUNTERS command, the new /LINK qualifier identifies the link for which you want counters displayed.
 - The display generated by SHOW SERVERS includes the Ethernet link used by a terminal server to access your node.
- Addition of a new qualifier for the SHOW COUNTERS command, /INACTIVE, which displays the counters for terminal servers previously connected to a VMS service node. This display includes all the counters since they were last set to zero on the VMS service node.
- Addition of service node link information in the output to the SHOW CHARACTERISTICS command.
- Addition of a new qualifier, /DEDICATED, for the CREATE PORT and SET PORT commands. The /DEDICATED qualifier offers an application program as a service to terminal server users by mapping a set of dedicated ports to an application program.
- Addition of a new qualifier for the SHOW PORTS command, /DEDICATED, which displays the dedicated ports on a VMS service node.



LATCP Description

The LAT Control Program (LATCP) is the utility program that you use to configure and control the Local Area Transport (LAT) protocol on VMS host systems. VMS systems that join a LAT configuration are called service nodes. You can use LATCP to do the following:

- Specify operational characteristics for your service node and its services
- Start and stop the LAT port driver (LTDRIVER)
- Display status for your LAT service node
- Show and zero LAT counters

You can set up your VMS system as a full service node or restrict incoming access to a specific application program. The *Guide to Setting Up a VMS System* and the *VMS I/O User's Reference Volume* outline the procedure you use to set up access to a dedicated application program.

With the LAT protocol, you can also make use of printers and other asynchronous devices that are connected to LAT terminal servers. See the *Guide to Setting Up a VMS System* and the *Guide to Maintaining a VMS System* for information on configuring remote devices on LAT.

Note: The **LTLOAD.COM** command procedure in **SYSS\$MANAGER** automatically loads the LAT port driver (LTDRIVER), configures your system as a LAT service node, and starts the LAT port driver on your system. Refer to the *Guide to Setting Up a VMS System* for information on how to include LTLOAD.COM as part of your site-specific startup procedure.

The description of LATCP covers the following topics:

- Invoking and exiting the utility
- Utility commands
- LATCP HELP Facility

1

Invoking and Exiting the Utility

Use of LATCP requires CMKRNL privilege.

Enter the following command to invoke LATCP:

```
$ RUN SYS$SYSTEM:LATCP
```

At the LCP> prompt, you can enter LATCP commands. To exit LATCP, type EXIT or press CTRL/Z after the LCP> prompt.

You can also execute a single LATCP command by using a DCL string assignment statement, as shown in the following example:

```
$ LCP ::= $LATCP
$ LCP START NODE
```

LATCP executes the START NODE command and returns control to DCL.

LATCP Description

2

Utility Commands

Table LAT-1 summarizes the LATCP commands.

Table LAT-1 Summary of LATCP Commands

Command	Function
CREATE LINK	Creates Ethernet links
CREATE PORT	Creates an application or dedicated port
CREATE SERVICE	Creates a service on a VMS service node
DELETE PORT	Deletes an application or dedicated port
DELETE SERVICE	Deletes a service on a VMS service node
EXIT	Returns the user to DCL command level
HELP	Displays help text for LATCP commands
SET COUNTERS/ZERO	Resets the service node counters
SET LINK	Modifies characteristics of Ethernet links
SET NODE	Specifies LAT characteristics for a VMS service node
SET PORT	Creates a logical port on a VMS service node that either connects with a remote device on a terminal server or a special application service
SET SERVICE	Changes service characteristics
SHOW CHARACTERISTICS	Displays service node characteristics
SHOW COUNTERS	Displays performance and error statistics for a LAT service node
SHOW PORTS	Displays port characteristics
SHOW SERVERS	Displays characteristics for all known servers
START NODE	Starts the LAT port driver (LTDRIVER)
STOP NODE	Stops the LAT port driver (LTDRIVER)

3

LATCP HELP Facility

LATCP provides a HELP Facility that contains information about each LATCP command and its parameters and qualifiers, as well as examples of its use. Refer to the HELP command description for more information about the LATCP HELP Facility.

LATCP Usage Summary

The LAT Control Program (LATCP) allows you to control and obtain information from the LAT port driver (LTDRIVER) on a VMS node.

FORMAT **RUN SYS\$SYSTEM:LATCP**

Command Qualifiers	Defaults
<i>None.</i>	<i>None.</i>

PARAMETERS *None.*

usage summary

To invoke LATCP, type RUN SYS\$SYSTEM:LATCP at the DCL command prompt. At the LCP> prompt, you can enter any of the LATCP commands described in the following section. These commands follow the standard rules of grammar as specified in the *VMS DCL Dictionary*.

To exit from LATCP, enter the LATCP command EXIT at the LCP> prompt or press CTRL/Z.

Use of LATCP requires the CMKRNL privilege.

LATCP

LATCP Commands

LATCP COMMANDS

This section describes the following LATCP commands and provides examples of their use.

CREATE LINK
CREATE PORT
CREATE SERVICE
DELETE PORT
DELETE SERVICE
EXIT
HELP
SET COUNTERS/ZERO
SET LINK
SET NODE
SET PORT
SET SERVICE
SHOW CHARACTERISTICS
SHOW COUNTERS
SHOW PORTS
SHOW SERVERS
START NODE
STOP NODE

CREATE LINK

Creates the Ethernet links that you want a VMS service node to use.

FORMAT **CREATE LINK** *link-name*

PARAMETER *link-name*
Specifies a name for an Ethernet link. A link name can have up to 16 ASCII characters. (See the CREATE SERVICE command for a list of legal characters.) You can create a maximum of two links on your node. Use the SHOW CHARACTERISTICS command for a list of the link names that are defined for your node.

QUALIFIERS ***/[NO]DECNET***
Directs LAT protocol to use the DECnet Ethernet address (/DECNET) or the hardware address (/NODECNET) when starting the Ethernet controller. The default is /DECNET.

/DEVICE=device-name
Specifies the Ethernet controller device name for an Ethernet link; for example, XEB0. Only one Ethernet link can be associated with an Ethernet controller. If you enter the CREATE LINK command without the /DEVICE qualifier, LATCP attempts to find an available controller. You can specify a default device name by defining the LAT\$DEVICE logical name.

/ENABLE=(group-code[,...])
Specifies the service groups that can be used on the link. There can be up to 256 groups, numbered from 0 through 255. If you specify only one group, you can omit the parentheses.

By default, no groups are enabled for a link. In this case, the groups that you enabled for the service node with SET NODE or START NODE apply to the link.

If you enable groups with this qualifier, only the specified groups apply to the link; the groups enabled for your service node do not apply.

/[NO]LOG
Specifies whether the link characteristics are displayed when this command is executed. The default is /LOG.

DESCRIPTION The CREATE LINK command creates an Ethernet link for a VMS service node and assigns a name to the link. A VMS service node can have two Ethernet links. Each link must operate on a separate Ethernet controller and have its own Ethernet coaxial cable.

LATCP

CREATE LINK

If you do not explicitly create a link with this command before entering the START NODE command, LATCP automatically creates a link for you. LATCP names the link LAT\$LINK and assigns it to the first available Ethernet controller or LAT\$DEVICE, if defined. To establish additional links, use the CREATE LINK command.

Whenever you create a link, specify the Ethernet controller device name. In addition, you can specify the groups that you want enabled for each link.

Use the SET LINK command to modify link characteristics.

EXAMPLE

```
LCP> CREATE LINK Network_A /DEVICE=XEBO: /ENABLE=(1,2)
```

The CREATE LINK command in this example creates a link to the Ethernet network named Network_A. It specifies the Ethernet controller device XEBO for that link. The command enables groups 1 and 2 for the Network_A Ethernet link.

CREATE PORT

Creates a logical port on a VMS service node that connects with either a remote device on a terminal server or an application program.

FORMAT **CREATE PORT** *port-name*

PARAMETER ***port-name***
Specifies the port name in the form *LTAn:*, where *n* is a unique number from 1 through 9999. If the port you specify already exists, LATCP returns an error message.

QUALIFIERS ***/APPLICATION***
Specifies that a logical port on a VMS service node will be used to connect to a remote device (typically a printer) on a terminal server. The default port type is */APPLICATION*.

/DEDICATED
Specifies that a logical port on a VMS node is reserved for an application service. When terminal server users request a connection to this service name, they are connected to the dedicated port, provided the application program has assigned a channel to the port. See the *VMS I/O User's Reference Volume* for a description of programming an application service.

After creating a dedicated port on a VMS service node, use the SET PORT */DEDICATED /SERVICE* command to map this port to a service.

/[NO]LOG
Specifies whether characteristics of the ports on your service node are displayed when this command is executed. The default is */LOG*.

DESCRIPTION The CREATE PORT command creates a logical LAT port for your service node. The port can be set up as an applications port that is later mapped to a remote printer (or other device) on a server. Alternatively, the port can be set up as a dedicated port for a special service.

After creating a port, use the SET PORT command to associate the port with a queue or a service. Ordinarily, you create and set ports in the LAT startup procedure, LTLOAD.COM. See the *Guide to Setting Up a VMS System* for more details.

LATCP

CREATE PORT

EXAMPLES

1 LCP> CREATE PORT LTA27: /APPLICATION

The CREATE PORT command in this example creates an applications port named LTA27 on a VMS service node. It is mapped to a remote device on a terminal server.

2 LCP> CREATE PORT LTA28: /DEDICATED

The CREATE PORT command in this example creates the port LTA28. It will be used as a dedicated port that offers a specific service rather than all the resources of the service node.

CREATE SERVICE

Creates a service on a VMS service node.

FORMAT **CREATE SERVICE** *service-name*

PARAMETER

service-name

Specifies a LAT service name. You can specify as many as eight service names for your node. By default, a service name is the translation of the SYS\$NODE logical name.

The service name can be from 1 to 16 ASCII characters. The characters allowed are as follows:

- Alphanumeric characters: A — Z, a — z, 0 — 9
- A subset of the international character set: ASCII codes 192 — 253
- Punctuation characters: dollar sign (\$), hyphen (-), period (.), and underscore (_)

QUALIFIERS

/IDENTIFICATION="identification-string"

Describes a VMS service offered or delivers a message to terminal servers on the Ethernet. By default, the identification string is a translation of SYS\$ANNOUNCE. A VMS service node advertises its services at regular intervals, established in the SET NODE command.

An identification string can have up to 64 ASCII characters but cannot begin with an ampersand (&). Nonprintable characters are translated as spaces. Enclose the string in quotation marks (").

/LINK=(link-name[,...])

Specifies the Ethernet link on which you want to offer the service. If you specify one link, you can omit the parentheses. This link must have been created, either explicitly with the CREATE LINK command or implicitly with the START NODE command. By default, a service is offered on all the Ethernet links defined for your node. In most cases, you should offer services over all of the Ethernet links. The SHOW CHARACTERISTICS command displays the links that are currently defined for your node.

You can use this qualifier to limit the users of a service to a particular Ethernet link.

/[NO]LOG

Specifies whether the characteristics for your service node are displayed when this command is executed. The default is /LOG.

/[NO]STATIC_RATING=rating

Enables or disables dynamic service ratings. A dynamic service rating means that a LAT algorithm calculates the availability of a service. A dynamic service rating, which is the default, is usually adequate for efficient load balancing on the LAT network. You can use the static rating to direct terminal

LATCP

CREATE SERVICE

server users away from or toward a particular node temporarily. Static ratings range from 0 (heavily loaded) to 255 (not heavily loaded).

DESCRIPTION

The CREATE SERVICE command creates a service that a VMS service node offers to terminal servers on the LAT network. You can create up to eight services per node. These can be general timesharing services or special application services. Creating a special application service involves defining a dedicated port, using the CREATE PORT and SET PORT commands. Most often, a system manager creates services in LTLOAD.COM, the LAT startup procedure. See *Guide to Setting Up a VMS System* for further information on creating an application service. The *VMS I/O User's Reference Volume* shows how to program an application service.

Several service nodes can share one service name. A shared service name is especially useful in VAXclusters because it allows the cluster to be known by a single cluster name. On login, the terminal server connects to the least-busy node offering that service.

You can modify the service characteristics with the SET SERVICE command.

EXAMPLE

```
LCP> CREATE SERVICE SALES /LINK=(Network_A,Network_B) -  
_LCP> /STATIC_RATING=195
```

The CREATE SERVICE command in this example creates the service "SALES" on a VMS service node. The service will be offered on the Ethernet links named Network_A and Network_B. This command also assigns a static rating of 195 so terminal servers can assess the availability of services on the node.

DELETE PORT

Deletes a logical port from a VMS service node.

FORMAT **DELETE PORT** *port-name*

PARAMETER *port-name*

Specifies the name of the applications port or the dedicated port that you want to delete. An applications port connects to a remote device on a terminal server, whereas a dedicated port connects to a special VMS service.

The port must have been created with the CREATE PORT command. Use the SHOW PORTS command for a list of the applications ports and the dedicated ports that are defined for your service node.

DESCRIPTION The DELETE PORT command stops any active session on the port and then deletes this port from your service node.

EXAMPLE

LCP> DELETE PORT LTA27:

The DELETE PORT command in this example deletes the applications port LTA27. The port was created with the CREATE PORT command.

LATCP

DELETE SERVICE

DELETE SERVICE

Deletes a service that your VMS service node currently offers.

FORMAT **DELETE SERVICE** *service-name*

PARAMETER ***service-name***
Specifies the name of the service, as displayed by the SHOW CHARACTERISTICS command. By default, the service name is the translation of SYS\$NODE.

QUALIFIERS ***/[NO]LOG***
Specifies whether the characteristics for your service node are displayed when this command is executed. The default is /LOG.

DESCRIPTION The DELETE SERVICE command removes a service from a VMS service node. The service is no longer available to terminal server users, and is no longer multicast in the configuration messages sent by your service node.

EXAMPLE

LCP> DELETE SERVICE SALES

The DELETE SERVICE command in this example removes the service SALES from your service node. The service is no longer available to server users.

EXIT

Stops execution of LATCP and returns control to the DCL command level.
You can also type CTRL/Z to exit at any time.

FORMAT **EXIT**

PARAMETERS *None.*

EXAMPLE

LCP> EXIT

The EXIT command in this example exits the LATCP program and returns control to the DCL command level.

LATCP

HELP

HELP

Provides online help information for using the LATCP commands.

FORMAT **HELP** *[command-name]*

PARAMETER ***command-name***
The name of a LATCP command. If you enter the HELP command with a command name only, such as HELP SET, LATCP displays a list of all of the command keywords used with the SET command.

DESCRIPTION The HELP command is an online reference for LATCP commands. After you view an initial help display, press RETURN. The help display stops and the LATCP prompt is displayed. If you do not specify a command name, the HELP command displays general information on the commands for which help is available. Supplying a command name obtains syntax information on that command.

EXAMPLE

LCP> HELP SET PORT

In this example, the HELP SET PORT command produces a description of the SET PORT command and shows the command format.

SET COUNTERS/ZERO

The SET COUNTERS/ZERO command resets the service node counters. The /ZERO qualifier is required.

FORMAT **SET COUNTERS/ZERO**

PARAMETERS *None.*

DESCRIPTION The SET COUNTERS/ZERO command allows you to test the performance of a VMS service node over a period of time. Once the counters for a VMS service node are set to zero, you can observe node performance and error statistics over a specific period using the LATCP command SHOW COUNTERS/NODE.

You cannot use the SET COUNTERS/ZERO command to set device counters or terminal server counters to zero.

EXAMPLE

LCP> SET COUNTERS/ZERO

The SET COUNTERS/ZERO command in this example resets your service node counters to zero.

LATCP

SET LINK

SET LINK

Changes the characteristics of Ethernet links.

FORMAT **SET LINK** *link-name*

PARAMETER ***link-name***
Specifies the name for an Ethernet link. A link name can have up to 16 ASCII characters. (See the CREATE SERVICE command for a list of legal characters.) The SHOW CHARACTERISTICS command displays the names of the links defined for a VMS service node.

COMMAND QUALIFIERS ***/[NO]DECNET***
Directs LAT protocol to use the DECnet Ethernet address (*/DECNET*) or the hardware address (*/NODECNET*) when starting the Ethernet controller. The default is */DECNET*. Note that you cannot change the characteristics of an active link.

/DEVICE=device-name
Specifies the Ethernet controller device name for the link; for example, XEA0. Only one link can be associated with any Ethernet controller and its related Ethernet cable. You cannot change the device for an active link.

/DISABLE=(group-code[,...])
Removes previously enabled groups associated with a link.

/ENABLE=(group-code[,...])
Specifies additional groups that you want enabled for a link. If there is only one group, you can omit the parentheses. There are 256 groups, numbered from 0 through 255. See the SET NODE command for more information on groups.

 You can change groups for an active link.

/[NO]LOG
Specifies whether to display link characteristics when the command executes. The default is */LOG*.

DESCRIPTION The SET LINK command allows you to change the characteristics for an Ethernet link. The link must have been created with the CREATE LINK command. If no links are created when the SET NODE command executes, it creates a default link named LAT\$LINK.

EXAMPLE

```
LCP> SET LINK Network_A /ENABLE=(8,11)
```

The SET LINK command in this example assigns the groups 8 and 11 to the Ethernet link, Network_A.

SET NODE

Specifies the LAT characteristics of a VMS service node.

FORMAT **SET NODE** *node-name*

PARAMETER ***node-name***

Specifies a name for a VMS service node. By default, the node name is the translation of SYS\$NODE. A LAT service node name should be the same as the DECnet node name. If the VMS service node is not running DECnet but will be in the future, it is recommended that you define SYS\$NODE and use it for both DECnet and LAT node names.

A node name can be from 1 to 16 ASCII characters. The characters allowed are as follows:

- Alphanumeric characters: A — Z, a — z, 0 — 9
- A subset of the international character set: ASCII codes 192 — 253
- Punctuation characters: dollar sign (\$), hyphen (-), period (.), and underscore (_)

QUALIFIERS ***/DISABLE=(group-code[,...])***

Removes previously enabled groups associated with your service node. If you enter one group code, you can omit the parentheses. The SHOW CHARACTERISTICS command displays the groups enabled for your service node.

/ENABLE=(group-code[,...])

Gives the listed groups access to your service node. A network manager organizes terminal server nodes into groups, based on the number of terminal server nodes in the LAT network. Groups subdivide the LAT network, limiting the number of terminal server nodes that can connect with a given VMS service node.

There can be as many as 256 groups, numbered 0 through 255. By default all terminal server nodes belong to group 0. If you enter one group code, you can omit the parentheses. Use the SHOW CHARACTERISTICS command for a list of the groups enabled for your service node.

/IDENTIFICATION="identification-string"

Describes a service offered by a VMS service node or delivers a message to terminal servers on the Ethernet. By default, the identification string is the translation of SYS\$ANNOUNCE. A VMS service node advertises its services at regular intervals, established in the SET NODE command.

An identification string can have up to 64 ASCII characters but cannot begin with an ampersand (&). Nonprintable characters are translated as spaces. Enclose the string in quotation marks (").

/[NO]LOG

Specifies whether your service node characteristics are displayed when this command is executed. The default is /LOG.

/MULTICAST_TIMER=seconds

Specifies the time, in seconds, between multicast messages sent by a VMS service node. A multicast message, established with the /IDENTIFICATION qualifier, advertises the services offered by a VMS service node. The minimum value is 10 seconds; the maximum is 255 seconds. The default value is 60.

DESCRIPTION

The SET NODE command, which is typically executed in the LAT startup command procedure, LTLOAD.COM, allows you to specify the following:

- Node name
- Node identification
- Service Groups
- Timing of service advertisements

Because LATCP commands change characteristics dynamically, you can use the SET NODE command any time the LAT port driver is active. See the *Introduction to VMS System Management* for a description of a VMS service node.

EXAMPLES

1 LCP> SET NODE DUKE /IDENT="NODE DUKE, SALES VAXCLUSTER"

The SET NODE command in this example specifies that the announcement "NODE DUKE, SALES VAXCLUSTER" is multicast from node DUKE.

2 LCP> SET NODE DUKE /MULTICAST_TIMER=50 /ENABLE=(1,8,11)

The SET NODE command in this example causes the node DUKE to send multicast messages every 50 seconds that advertise DUKE's services to terminal servers. The command also enables groups 1, 8, and 11 for node DUKE.

3 LCP> SET NODE DUKE /DISABLE=2

The SET NODE command in this example disables group 2 for node DUKE. Group 2 was previously enabled for the service node.

LATCP

SET PORT

SET PORT

Logically associates an applications port on a VMS service node with a remote port on a terminal server that supports a device. Alternatively, it creates a logical port on a VMS service node that is dedicated to a specific service.

FORMAT **SET PORT** *port-name*

PARAMETER ***port-name***
Specifies the name of the port. A port name must be in the form *LTAn:*, where *n* is a unique number from 1 through 9999.

QUALIFIERS ***/APPLICATION***
Specifies that a port on a VMS service node is an applications port, logically associated with a port on a remote terminal server. The terminal server port supports a device, for example, a printer. If the port is used to support a printer, the print queue is established in a startup command procedure, as described in *Guide to Maintaining a VMS System*.

The port must have been created with the CREATE PORT command.

/DEDICATED
Specifies that a port on a VMS service node functions as a dedicated logical port through which terminal server users connect with a special service. The */DEDICATED* qualifier requires the */SERVICE* qualifier.

To create a special service, create the service and define the dedicated port (CREATE PORT/*DEDICATED*) in *LTLOAD.COM*, which is executed in *SYSTARTUP_V5.COM*. Then run the application program. Within the program, allocate dedicated ports with the same name as those defined in *LTLOAD.COM*. See *Guide to Setting Up a VMS System* and *VMS I/O User's Reference Volume* for further information.

/LINK=(link-name[,...])
Specifies the name of the Ethernet link that the applications port uses. If you use the SET PORT command and do not specify a link name, and no link has been defined, LATCP creates a default link name called *LAT\$LINK* and assigns an Ethernet controller device to this link. To look at the links defined for your node, use the SHOW CHARACTERISTICS command.

/[NO]LOG
Specifies whether or not to display the characteristics of the ports on your service node when this command is executed. The default is */LOG*.

/NODE=remote-node-name
Specifies the name of a terminal server that supports a remote device and is logically associated with an applications port on your VMS service node.

/PORT=remote-port-name

Specifies the name of the remote port on a terminal server that supports a remote device and is logically associated (mapped) with an applications port on a VMS service node.

/[NO]QUEUED

Specifies queued or nonqueued access to the server port. The default is /QUEUED.

A queued or nonqueued request is accepted by a terminal server if a remote port is free. If the remote port is busy and queuing is enabled on both the terminal server and the VMS service node, then a remote request is queued. If you do not want your remote requests to be queued on the server, specify /NOQUEUED; however, do not specify /NOQUEUED for a port that you want accessed by the LATSYM print symbiont.

/SERVICE=service-name

Specifies either: (1) the name of the remote service offered at the terminal server port that is to be associated with an applications port (/APPLICATION) for a device, or (2) a service name for an application program being offered on a dedicated port (/DEDICATED) on a VMS service node.

To specify the name of a remote service offered at a terminal server port, use the /NODE and the /SERVICE qualifiers. To specify a particular port for a service, use the /NODE, /PORT, and /SERVICE qualifiers. Ask the terminal server manager for these names.

To name a service for a particular application program to be offered on a dedicated port, use the /DEDICATED and the /SERVICE qualifiers. The service must have been created with the CREATE SERVICE command. Assign only one service to a dedicated port. Several ports can have the same service assigned.

DESCRIPTION

The SET PORT command maps an applications port on your service node to a port on a terminal server. The applications port must have been created with the CREATE PORT/APPLICATION command.

The SET PORT command can also be used to set up a service to be offered via a dedicated port on a VMS service node. This service is offered to terminal server users. The dedicated port must have been created with the CREATE PORT/DEDICATED command.

You can use the SET PORT command to specify an Ethernet link for an applications port.

LATCP

SET PORT

EXAMPLES

1 LCP> SET PORT LTA28: /NODE=TLAT2 /PORT=PORT_7 /LINK=Network_B

The SET PORT command in this example associates the applications port LTA28 with the port named PORT_7 on the terminal server named TLAT2. The applications port uses the Ethernet named Network_B.

2 LCP> SET PORT LTA30: /NODE=TLAT1 /SERVICE=PRINTER /QUEUED

The SET PORT command in this example associates the applications port LTA30 with the service PRINTER on terminal server TLAT1. The service PRINTER can be associated with one or more ports on TLAT1. The /QUEUED qualifier specifies that the server offering the service PRINTER queues the remote connection request. See *Guide to Maintaining a VMS System* for information on setting up print queues.

3 LCP> SET PORT LTA329: /DEDICATED /SERVICE=GRAPHICS

The SET PORT command in this example specifies that the service GRAPHICS is offered to terminal server users by a VMS service node on the dedicated port LTA29. GRAPHICS is a particular utility or application program.

SET SERVICE

Dynamically changes the characteristics of a service.

FORMAT **SET SERVICE** *service-name*

PARAMETER *service-name*

Specifies the service whose characteristics are to be modified. If a service name is omitted, the default service name is the translation of SYS\$NODE.

QUALIFIERS */IDENTIFICATION="identification-string"*

Provides a new description of a VMS service or delivers a message to terminal servers on the Ethernet. By default, the identification string is the translation of SYS\$ANNOUNCE. A VMS service node advertises its services at regular intervals, established in the SET NODE command.

An identification string can have up to 64 ASCII characters but cannot begin with an ampersand (&). Nonprintable characters are translated as spaces. Enclose the string in quotation marks.

/LINK=(link-name[,...])

Specifies which links offer the service. Unless you specify a link name for a service, the service is offered on all active Ethernet links. The SHOW CHARACTERISTICS command displays links that are defined for a VMS service node.

/[NO]LOG

Specifies whether or not to display the qualifier values used in this command when this command is executed. The default is /LOG.

/[NO]STATIC_RATING=rating

Enables or disables dynamic service ratings. The default is /NOSTATIC_RATING. A dynamic service rating means that a LAT algorithm calculates the availability of a service. A dynamic service rating, which is the default, is usually adequate for efficient load balancing on the LAT network. You can use the static rating to direct terminal server users away from or toward a particular node temporarily. Static ratings range from 0 (heavily loaded) to 255 (not heavily loaded).

DESCRIPTION

The SET SERVICE command dynamically changes the characteristics of a service that you created with the CREATE SERVICE command. You can also specify the Ethernet links for each service. If you do not specify the Ethernet links for a service, that service is offered over all active links.

Service node characteristics established in the LTLOAD.COM file become operational upon system startup.

LATCP

SET SERVICE

EXAMPLE

```
LCP> SET SERVICE SALES /IDENT="SALES FORCE TIMESHARING SERVICES"
```

The SET SERVICE command in this example specifies a new announcement "SALES FORCE TIMESHARING SERVICES" for the service SALES. This string is announced with the service SALES in the multicast messages sent by a VMS service node.

SHOW CHARACTERISTICS

Displays the characteristics of a VMS service node.

FORMAT SHOW CHARACTERISTICS

PARAMETERS *None.*

QUALIFIERS *None.*

DESCRIPTION This command displays the following information for your LAT service node.

- Node characteristics — the name, identification string, enabled groups, and broadcast interval
- LAT protocol version
- LAT protocol status — active or inactive
- Service characteristics — name, identification string, dynamic or static rating
- Characteristics of the Ethernet links — the name, Ethernet controller device, services, and status

EXAMPLE

LCP> SHOW CHARACTERISTICS

The SHOW CHARACTERISTICS command in this example provides the following description of your VMS service node:

```
LCP Characteristics
Node name = \REDWOD\
Node Identification = \REDWOD (VAX 8800) -- A member of the FOREST VAXcluster\
Groups = (0,73,74,127)
Multicast timer = 60 seconds
LAT Version = 5.1                    LAT Protocol is active

Service name : \REDWOD\                    rating : <AUTO>
              ID : \REDWOD (VAX 8800) -- A member of the FOREST VAXcluster\

Service name : \FOREST\                    rating : <AUTO>
              ID : \FOREST -- The accounting department VAXcluster\

Node Links:
```

LATCP

SHOW CHARACTERISTICS

Link name = \LAT\$LINK\
Link device = \XQA0:\
Groups = ()
Link-specific services:
Status = Active

Link name = \2ND_ETHERNET\
Link device = \XQB0:\
Groups = ()
Link-specific services:
Status = Inactive

SHOW COUNTERS

Displays performance and error statistics for a VMS service node.

FORMAT **SHOW COUNTERS**

PARAMETERS *None.*

QUALIFIERS ***/DEVICE***
Displays the Ethernet device counters. This information is the sum of all Ethernet counters for a particular controller on your node, including LAT and DECnet. If you have more than one Ethernet controller device on your node, use the ***/LINK*** qualifier to specify the link name of the controller device for which you want the counters.

For additional information on device counters, see the *VMS Network Control Program Manual*.

/INACTIVE
In conjunction with the ***/SYSTEMS*** qualifier, displays the cumulative LAT counters for all terminal servers known to a VMS service node. To obtain a display of the current counters for the servers, use the ***/SERVERS*** qualifier.

/LINK=link-name
Used with the ***/DEVICE*** qualifier to specify the particular Ethernet link for which you want device counters displayed. Use the **SHOW CHARACTERISTICS** command for a list of the links that are defined for your service node. The default link is the first one that is defined for your service node.

/NODE
Displays LAT counters for a VMS service node. (It excludes DECnet counters.) This is the default if no qualifiers are specified with the **SHOW COUNTERS** command.

/SERVERS
Displays current LAT counters for all terminal servers currently connected to a VMS service node. To obtain a display of the cumulative counters for previous server connections, include the ***/INACTIVE*** qualifier with the ***/SERVERS*** qualifier.

Table LAT-2 provides descriptions of the LAT counters.

LATCP

SHOW COUNTERS

DESCRIPTION This command displays counter information tabulated by the LAT port driver. The following table gives descriptions of the LAT counters displayed with SHOW COUNTERS.

Table LAT-2 LAT Node Counters

Counter	Description
Receive frames	The number of LAT messages successfully received by the node.
Receive errors	The number of received messages with detected problems. The Ethernet controller flags these messages.
Receive duplicates	The number of duplicate messages that are received; this can indicate a system slowdown.
Transmit frames	The number of LAT messages successfully transmitted by the node.
Transmit errors	The number of transmitted messages with detected problems. The Ethernet controller flags these messages.
Last transmit failure code	A hexadecimal number that indicates the reason for the last transmit failure. If a failure code exists, the reasons for failure are shown at the end of the counters display.
Retransmissions	The number of LAT messages that the node retransmitted because they were not acknowledged by terminal servers.
Circuit timeouts	The number of times a circuit to a terminal server timed out, indicating that a server failed to send a valid message in the required time span.
Protocol errors	The number of LAT messages with an illegal format received by the node. The actual error identification is recorded in the protocol error bit mask.
Protocol bit mask	A bit explaining which errors have occurred. The SHOW COUNTERS command reports errors at the end of the display. Table LAT-3 explains which errors the counter displays.
Resource errors	The number of times the service node attempted to create a circuit with a new server but failed because of insufficient resources.
No transmit buffer	The number of times no buffer was available for transmission.

Table LAT-2 (Cont.) LAT Node Counters

Counter	Description
Unit timeouts	A repeat of a deallocation of resources. This occurs when an attempt is made to deallocate a Unit Control Block (UCB) that was already deallocated. This happens when there is an attempt to stop a LAT circuit on the service node.
Solicitation failures	The number of times a request for a connection to a remote device failed.
Discarded output bytes	The number of data bytes that were discarded because of an overflow of an internal buffer before the data could be output to an LT device.

A protocol bit mask is a hexadecimal number that indicates circuit message errors or slot errors. If you convert this number to binary format, you can find the definition of the protocol error bit mask in Table LAT-3.

Table LAT-3 Protocol Error Bit Mask Definitions

Bit	Meaning
0	Invalid start message received
1	Zero node index received
2	Node circuit index out of range
3	Node circuit sequence invalid
4	Node circuit index no longer valid
5	Circuit was forced to halt
6	Invalid server slot index
7	Invalid node slot index
8	Invalid credit field or too many credits used
9	Repeat create of slot by server
10	Invalid sequence number received in start message
11	Repeat disconnect of slot by server

EXAMPLES

1 LCP> SHOW COUNTERS /NODE

The SHOW COUNTERS command in this example generates the following type of display:

LATCP

SHOW COUNTERS

```
LCP Node Counters
127597 Receive frames
  0 Receive errors
  3 Receive duplicates
161885 Transmit frames
  0 Transmit errors
00000000 Last transmit failure code
  28 Retransmissions
  6 Circuit timeouts
  0 Protocol errors
00000000 Protocol bit mask
  0 Resource errors
  0 No transmit buffer
  0 Unit timeouts
  0 Solicitation failures
  0 Discarded output bytes
```

2 LCP> SHOW COUNTERS /SERVERS

The SHOW COUNTERS command in this example generates the following type of display:

```
LCP Server Counters for LAT1
7882 Receive frames
8743 Transmit frames
  0 Retransmissions
  0 Out of sequence frames
  0 Invalid messages
  0 Invalid slots
```

3 LCP> SHOW COUNTERS /DEVICE /LINK=Network_A

The SHOW COUNTERS command in this example produces the following type of display:

```
44663 Seconds since last zeroed
3977150 Receive frames
  1 Receive errors
2674549 Multicast frames received
356057222 Receive bytes
222254423 Multicast bytes received
1512978 Transmit frames
  2 Transmit errors
  21395 Multicast frames transmitted
391334113 Transmit bytes
2762791 Multicast bytes transmitted
44416 Frames sent, single collision
65535 Frames sent, multiple collision
273328 Frames sent, initially deferred
  0 Transmit collision detect check failure
3815 Data overruns
  107 System buffer unavailable
  0 User buffer unavailable
```

Receive errors include:

- CRC errors
- Framing errors

Transmit errors include

- more than 16 retry failures

SHOW PORTS

Displays the characteristics of ports on a VMS service node.

FORMAT **SHOW PORTS** [*port-name*]

PARAMETER ***port-name***
Specifies the name of the port for which information is displayed. The SHOW PORTS command without a port name displays the characteristics for all LTA*n* ports on a service node.

Do not use the /APPLICATION, /DEDICATED, or /INTERACTIVE qualifiers with a specific port name.

QUALIFIERS ***/APPLICATION***
Generates a display of all applications ports.

/DEDICATED
Generates a display of all dedicated ports.

/INTERACTIVE
Generates a display of all LAT interactive ports.

DESCRIPTION If a port is an applications port, the display lists the remote node name, remote port name, and remote service name that you specified in the SET PORT command.

If the port is a dedicated port, the display lists the service name that you specified in the SET PORT command.

If the port is shown as <interactive> in the display, it is currently being used by a terminal server user.

For all ports with active sessions, the terminal server sends the server node name and server port name to a VMS service node. These names are listed in the display. In addition, the link that the port uses is shown.

LATCP

SHOW PORTS

EXAMPLE

LCP> SHOW PORTS

The SHOW PORTS command in this example produces the following type of display:

```
Local Port Name = LTA27:    <interactive>
    Actual Remote Node Name = TLAT1
    Actual Remote Port Name = PORT_7
    Link Name = Network_A
```

```
Local Port Name = LTA28:    <application>
    Specified Remote Node Name = TLAT2
    Specified Remote Port Name = PORT_7
    Specified Remote Service Name = PRINTER
    Actual Remote Node Name = TLAT2
    Actual Remote Port Name = PORT_7
    Link Name = Network_B
```

```
Local Port Name = LTA29:    <dedicated>
    Specified Service Name   = GRAPHICS
    Link Name = Network_A
```

The first port the example displays is the interactive port LTA27, which is connected via LAT Port_7 on the TLAT1 server. The Ethernet link is Network_A. In this display the presence of the actual values indicates an established connection.

The second port the example displays is the LTA28 applications port. This port is mapped to the following:

- The remote server TLAT2
- The remote port 7
- The remote service PRINTER

The presence of the actual values in the display indicates an established connection. The Ethernet link is Network_B.

The third port the example displays is LTA29, a dedicated port on a VMS service node that offers the service GRAPHICS to terminal server users on the Network_A Ethernet.

SHOW SERVERS

Displays the characteristics of terminal servers known to a VMS service node, and indicates which Ethernet link the servers use to access the VMS node.

FORMAT **SHOW SERVERS**

PARAMETERS *None.*

QUALIFIERS */INACTIVE*
Displays the cumulative counters for all servers known to your service node. To obtain a display of the current counters, enter the SHOW COUNTERS /SERVER command.

DESCRIPTION Displays the following information about terminal servers known to a VMS service node:

- Ethernet address
- Server status
- Number of active users
- Ethernet link

EXAMPLE

LCP> SHOW SERVERS

The SHOW SERVERS command in this example produces the following display:

```
LCP Server Characteristics for TLAT1
Ethernet address = 08-00-2B-02-F2-EC
Server is active
Link Name = Network_A            Active users = 1
```

LATCP

START NODE

START NODE

Starts the LAT port driver and sets service node characteristics. This command also activates specific links on a VMS service node.

FORMAT **START NODE** *[node-name]*

PARAMETER ***node-name***

Specifies the name you choose for a VMS service node. The default is the translation of SYS\$NODE. A node name should be the same as the DECnet node name. The node name can be from 1 to 16 characters long. The characters allowed are as follows:

- Alphanumeric characters: A — Z, a — z, 0 — 9
- A subset of the international character set: ASCII codes 192 — 253
- Punctuation characters: dollar sign (\$), hyphen (-), period (.), and underscore (_)

The DECnet node name must be unique within the same logical Ethernet as well as within the entire DECnet network. By default, on DECnet nodes the LAT node name is given the DECnet node name, which is the translation of the SYS\$NODE logical name.

QUALIFIERS ***[/[NO]DECNET***

Directs the LAT protocol to use the DECnet Ethernet address (/DECNET) or the hardware address (/NODECNET) when starting the Ethernet controller. The default is /DECNET.

The /NODECNET qualifier can help improve performance when you have two Ethernet controllers on a VAX processor. You can restrict LAT traffic to one Ethernet controller and DECnet traffic to the other. Note that once you start the LAT protocol using the /NODECNET qualifier, you cannot start DECnet on the same Ethernet link without stopping the LAT port driver and restarting it.

/DISABLE=(group-code[,...])

Removes previously enabled groups associated with a VMS service node.

/ENABLE=(group-code[,...])

Gives listed groups access to a VMS service node. There are 256 groups, numbered from 0 through 255. By default, group 0 is enabled. If you enter only one group code, you can omit the parentheses.

/IDENTIFICATION="identification-string"

Describes a VMS service offered or delivers a message to terminal servers on the Ethernet. By default, the identification string is the translation of SYS\$ANNOUNCE. A VMS service node advertises its services at regular intervals, established in the SET NODE command.

LATCP

START NODE

An identification string can have up to 64 ASCII characters but cannot begin with an ampersand (&). Nonprintable characters are translated as spaces. Enclose the string in quotation marks.

/LINK=(link-name[,...])

Specifies the name(s) of the link(s) that you want activated on a VMS service node. If you do not specify a link name, all defined links on your node are started. If you supply only one link name, you can omit the parentheses.

/[NO]LOG

Specifies whether to display your service node characteristics when this command is executed. /NOLOG prevents the display. The default is /LOG.

/MULTICAST_TIMER=seconds

Specifies the time, in seconds, between the multicast messages sent by your service node. The minimum value is 10 seconds; the maximum is 255 seconds. The default value is 60.

DESCRIPTION

The START NODE command activates the LAT port driver. Under most circumstances, you execute the START NODE command from the LAT startup procedure, LTLOAD.COM, which is called from SYSTARTUP_V5.COM. See the *Guide to Setting Up a VMS System* for detailed information.

In cases where you want to start the LAT port driver interactively, you must first invoke the System Generation Utility (SYSGEN) to load the LAT port driver and the first LT: template unit control block (UCB) as follows:

```
$ RUN SYS$SYSTEM:SYSGEN
SYSGEN> CONNECT LTAO: /NOADAPTER
```

(The SYSGEN CONNECT command requires the CMKRNL privilege.)

After the LAT port driver is activated, you can establish VMS node characteristics with the START NODE command.

If you start a VMS service node without explicitly defining links (CREATE LINK), LATCP attempts to find an Ethernet controller on the node. If found, LATCP defines a default link named LAT\$LINK. You can assign a default name to the Ethernet controller device by defining the logical name LAT\$DEVICE.

The STOP NODE command clears the current node characteristics.

EXAMPLE

```
LCP> START NODE DUKE /LINK=Network_A
```

The START NODE command in this example starts node DUKE and activates the Network_A Ethernet link on node DUKE.

LATCP

STOP NODE

STOP NODE

Deactivates a specific Ethernet link on a VMS service node, or shuts down the LAT port driver on a VMS node, terminating sessions for all links.

FORMAT **STOP NODE**

PARAMETERS *None.*

QUALIFIERS ***/LINK=(link-name[,...])***
Specifies the name of the Ethernet link that you want to stop. Use this qualifier only if you want to stop a specific link.

/[NO]LOG
Specifies whether to display a confirmation message on the user's terminal when you shut down the LAT port driver. (Note that the actual shutdown takes a few seconds if the driver has to terminate active sessions.) The default is */LOG*.

DESCRIPTION The STOP NODE command stops the LAT port driver on all links or on a specified link, if you use the */LINK* qualifier.

Use the following procedure to stop the LAT port driver:

- 1 Notify LAT users to log out, using the DCL command *REPLY/ALL*.
- 2 Enter the LATCP command *STOP NODE*.

To reinstate the service node characteristics that were in effect prior to stopping the driver, do not use the *START NODE* command. Instead, invoke the *SYS\$MANAGER:LTLOAD.COM* command procedure. Alternatively, after stopping the LAT port driver with the *STOP NODE* command, you can set up your node characteristics manually with the *SET NODE*, *SET SERVICE*, and *SET LINK* commands.

EXAMPLES

1 LCP> STOP NODE /LINK=Network_A

The STOP NODE command in this example deactivates the Network_A Ethernet link on a VMS service node.

LATCP

STOP NODE

```
2 $ REPLY /ALL "LAT SERVICE SHUTTING DOWN IN 5 MINUTES. PLEASE LOG OFF"  
$ RUN SYS$SYSTEM:LATCP  
LCP> STOP NODE
```

The first command in this example notifies users connected through a terminal server that the node is shutting down and to log out of the service node. The second command invokes the LATCP utility. The last command shuts down the LAT port driver and disconnects all active sessions on all links to the node.



Index

A

Asynchronous device on LAT
application ports for •LAT-7

C

Command summary •LAT-2
Counter •LAT-1
displaying performance and error statistics •
LAT-15, LAT-27
CREATE LINK command •LAT-5
CREATE PORT command •LAT-7
CREATE SERVICE command •LAT-9

D

DELETE PORT command •LAT-11
DELETE SERVICE command •LAT-12

E

Ethernet link
creating •LAT-5
modifying characteristics of •LAT-16
number supported by LAT •LAT-5
EXIT command •LAT-13

H

HELP command •LAT-2, LAT-14

L

LAT Control Program
See LATCP

LATCP

exiting •LAT-1
invoking •LAT-1
LAT port driver (LTDRIVER) •LAT-1
starting •LAT-34
stopping •LAT-36
LAT service
dedicated applications •LAT-1
remote printing •LAT-1
LTLOAD.COM •LAT-1, LAT-19, LAT-34

N

Node name •LAT-18, LAT-34

P

Printer
configuring on a LAT •LAT-7
Privilege •LAT-1
Protocol bit mask
error definitions •LAT-29

S

Service
creating •LAT-9
dedicated applications •LAT-7
Service node •LAT-1
advertising •LAT-18, LAT-19
displaying general information •LAT-25
measuring the performance of •LAT-15
modifying characteristics of •LAT-23
naming •LAT-9, LAT-21
setting characteristics •LAT-18
SET COUNTERS/ZERO command •LAT-15
SET LINK command •LAT-16
SET NODE command •LAT-18
SET PORT command •LAT-20
SET SERVICE command •LAT-23
SHOW CHARACTERISTICS command •LAT-25
SHOW COUNTERS command •LAT-27

Index

SHOW PORTS command •LAT-31
SHOW SERVERS command •LAT-33
START NODE command •LAT-34
STOP NODE command •LAT-36

T

Terminal server
displaying characteristics of •LAT-33

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(LATCP) Manual
AA-LA32A-TE

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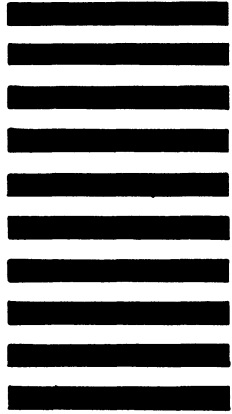
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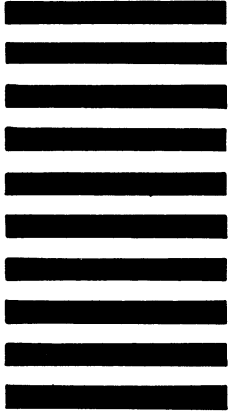
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