VMS LAT Control Program (LATCP) Manual

This document describes the LAT Control Program (LATCP).

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Preface

Intended Audience

This manual is for VMS system managers.

Document Structure

This document consists of the following parts:

- Description—Provides a brief description of the LAT Control Program Utility (LATCP), which is used to configure and control the 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.

This document also contains the following appendixes:

- Appendix A—Describes the LAT$CONFIG.COM and LAT$STARTUP.COM command procedures.
- Appendix B—Contains a summary of all LATCP commands and qualifiers.

Associated Documents

For an overview of the LAT protocol and 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 LAT architecture supported on Digital Terminal Servers, see *LAT Network Concepts*. The guide provides information on LAT network concepts, network configurations, network performance, and network troubleshooting. *LAT Network Concepts* is provided with Digital Terminal Servers and can be optionally ordered with the VMS documentation set.

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

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

The following conventions are used in this manual:

Ctrl/x	A sequence such as Ctrl/x indicates that you must hold down the key labeled Ctrl while you press another key or a pointing device button.
PF1 x	A sequence such as PF1 x indicates that you must first press and release the key labeled PF1, then press and release another key or a pointing device button.
Return	In examples, a key name is shown enclosed in a box to indicate that you press a key on the keyboard. (In text, a key name is not enclosed in a box.)
. . .	In examples, a horizontal ellipsis indicates one of the following possibilities: • Additional optional arguments in a statement have been omitted. • The preceding item or items can be repeated one or more times. • Additional parameters, values, or other information can be entered.
. . .	A vertical ellipsis indicates the omission of items from a code example or command format; the items are omitted because they are not important to the topic being discussed.
( )	In format descriptions, parentheses indicate that, if you choose more than one option, you must enclose the choices in parentheses.
[ ]	In format descriptions, brackets indicate that whatever is enclosed within the brackets is optional; you can select none, one, or all of the choices. (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.)
{}	In format descriptions, braces surround a required choice of options; you must choose one of the options listed.
red ink	Red ink indicates information that you must enter from the keyboard or a screen object that you must choose or click on. For online versions of the book, user input is shown in **bold**.
boldface text	Boldface text represents the introduction of a new term or the name of an argument, an attribute, or a reason. Boldface text is also used to show user input in online versions of the book.

italic text	Italic text represents information that can vary in system messages (for example, Internal error *number*).
UPPERCASE TEXT	Uppercase letters indicate that you must enter a command (for example, enter OPEN/READ), or they indicate the name of a routine, the name of a file, the name of a file protection code, or the abbreviation for a system privilege.
-	Hyphens in coding examples indicate that additional arguments to the request are provided on the line that follows.
numbers	Unless otherwise noted, all numbers in the text are assumed to be decimal. Nondecimal radixes—binary, octal, or hexadecimal—are explicitly indicated.

LATCP Description

The LAT Control Program (LATCP) is a utility program used for configuring and controlling the LAT driver on VMS systems. The LAT driver implements the LAT protocol. With LATCP, you can set up a VMS system as a **service node**: a LAT system that offers one or more resources (services) for access by users on other systems in the local area network (LAN).

A LAT **service** often consists of all the resources of a computer system. It can also be a specific resource on a computer system such as an application program. You can set up your VMS system as a **general timesharing service**, meaning that all of its resources are available to users in the LAN, or you can restrict access to a specific service (application program) on the system. 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.

In addition to being able to set up a VMS system to allow users on other systems to access its services, you can also set up the system to allow its users to access services on other systems in the LAN. In this case, the VMS system can act like a terminal server. It can manage multiple user sessions simultaneously for connections to services on other nodes.

You can set up a VMS system to support:

- Incoming access only
- Outgoing access only
- Both incoming and outgoing access

You can also set up your system so that it supports neither incoming nor outgoing access.

When you set up your VMS system to support outgoing access, the LAT software manages a database of LAT services and nodes. The software builds the database when you enable outgoing access on your node. (The software begins to collect LAT **service announcements** (multicast messages sent by LAT service nodes) and builds the database based on these service announcements.) You can use LATCP to display the services and nodes in this database and to control the size of the database. Allow outgoing access on systems that can tolerate the additional overhead, such as standalone systems.

Use LATCP to do the following:

- Specify operational characteristics for your VMS node and its services
- Start and stop the LAT port driver (LTDRIVER)
- Display status of LAT services and service nodes in the network
- Display status of links created on your LAT node
- Display status for your LAT node
- Show and zero LAT counters

- Recall previously-entered LATCP commands so that you can execute them again without having to retype them
- Create subprocesses so that you can execute DCL commands without exiting from LATCP

With the LAT protocol, you can set up logical ports on the local node so that users can access printers and other asynchronous devices that are connected to LAT terminal servers or service nodes on the LAN. The remote devices must be configured appropriately. 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.

The LAT protocol software is started on a VMS system by the SYS$STARTUP:LAT$STARTUP.COM command procedure, which is invoked by the SYS$MANAGER:SYSTARTUP_V5.COM command procedure. LAT$STARTUP.COM is supplied by Digital, and must not be edited. Appendix A explains how to invoke LAT$STARTUP.COM as part of your site-specific startup procedure, SYSTARTUP_V5.COM.

In turn, LAT$STARTUP.COM invokes SYS$STARTUP:LAT$CONFIG.COM, which loads the LAT port driver (LTDRIVER) and creates the LAT ancillary control process (LATACP). LAT$CONFIG.COM is supplied by Digital and must not be edited.

After invoking LAT$CONFIG, LAT$STARTUP invokes SYS$MANAGER:LAT$SYSTARTUP.COM which configures your system as a LAT service node. Digital supplies a template version of this file, named LAT$SYSTARTUP.TEMPLATE. You can modify LAT$SYSTARTUP to define site-specific LAT characteristics for your VMS node.

When you invoke LATCP and use LATCP commands (such as CREATE and SET) to add or change certain characteristics, these characteristics are not saved permanently. They stay in effect until the LAT port driver stops running. The next time you start the LAT port driver by invoking LAT$STARTUP.COM, the characteristics defined in LAT$SYSTARTUP.COM take effect again. If you want the added or changed characteristics to be in effect the next time you start the LAT port driver, edit LAT$SYSTARTUP.COM appropriately, then invoke LAT$STARTUP.COM. Appendix A shows the contents of LAT$SYSTARTUP.COM, as supplied by Digital, and an edited version of that file.

The remainder of this section covers the following topics describing LATCP:

- Invoking and exiting LATCP
- LATCP commands
- LATCP HELP Facility

1 Invoking and Exiting LATCP

Enter the following command to invoke LATCP:

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

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

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

```
$  LATCP :== $LATCP
$  LATCP SET NODE/STATE=ON
```

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

2 Utility Commands

Table LAT–1 summarizes the LATCP commands. Appendix B contains a summary of the commands and qualifiers.

Table LAT–1 Summary of LATCP Commands

Command	Function
ATTACH	Transfers control from your current process to the specified process.
CREATE LINK	Creates Ethernet links.
CREATE PORT	Creates an application port or dedicated port.
CREATE SERVICE	Creates a service on a VMS service node.
DEFINE/KEY	Assigns a command-string to a function key on your keypad.
DELETE LINK	Deletes an Ethernet link from a VMS node.
DELETE PORT	Deletes an application port 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.
RECALL	Recalls LATCP commands that you entered previously so that you can execute them again.
REFRESH	Refreshes your display screen; for example, after your display has been overwritten by output from some other source.
SET LINK	Modifies characteristics of Ethernet links.
SET NODE	Specifies LAT characteristics for a VMS node.
SET PORT	Maps a logical port on a VMS node to either a remote device on a terminal server or a special application service on a remote LAT service node.

(continued on next page)

Table LAT–1 (Cont.) Summary of LATCP Commands

Command	Function
SET SERVICE	Changes service characteristics.
SHOW LINK	Displays the characteristics of links on your VMS node.
SHOW NODE	Displays the characteristics of VMS nodes.
SHOW PORT	Displays port characteristics.
SHOW SERVICE	Displays characteristics of LAT services known to your VMS node.
SPAWN	Creates a subprocess.
ZERO COUNTERS	Resets the node counters, service counters, and link counters maintained by your VMS node.

3 LATCP HELP Facility

LATCP provides a HELP Facility that contains information about each LATCP command, its parameters and qualifiers, and 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 the LAT port driver (LTDRIVER) on a VMS node and to obtain information from it. For example, you can use LATCP to create services on the local VMS node, to associate a port on the local VMS node with a service or device on a remote terminal server, and to display information about services offered on the local node or on other nodes in the network.

When you use LATCP commands to change LAT characteristics (such as creating a service and associating a port with a service), the changes take effect immediately. However, when the LAT port driver stops, these characteristics are lost. If you want these characteristics to be in effect the next time you start the LAT port driver, edit LAT$SYSTARTUP.COM by modifying or adding commands to set these characteristics. Then, invoke LAT$STARTUP.COM to start the LAT port driver, as explained in Appendix A.

FORMAT

RUN SYS$SYSTEM:LATCP

Command Qualifiers

None.

Defaults

None.

Parameters

None.

usage summary

To invoke LATCP, enter RUN SYS$SYSTEM:LATCP at the DCL command prompt. At the LATCP> prompt, you can enter any of the LATCP commands described in the following section. These commands follow the standard rules of command line syntax as specified in the *VMS DCL Concepts Manual*.

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

LATCP COMMANDS

This section describes the following LATCP commands and provides examples of their use. Appendix B contains a summary of the commands and their qualifiers.

ATTACH
CREATE LINK
CREATE PORT
CREATE SERVICE
DEFINE/KEY
DELETE LINK
DELETE PORT
DELETE SERVICE
EXIT
HELP
RECALL
REFRESH
SET LINK
SET NODE
SET PORT
SET SERVICE
SHOW LINK
SHOW NODE
SHOW PORT
SHOW SERVICE
SPAWN
ZERO COUNTERS

ATTACH

Transfers control from your current process to the specified process. The LATCP ATTACH command is similar to the DCL ATTACH command. For example, from the DCL command level you can enter the DCL SPAWN command to create a LATCP subprocess without ending your DCL session, execute several LATCP commands at the LATCP prompt, then use the ATTACH command to return to DCL.

FORMAT

ATTACH *[process-name]*

PARAMETER

process-name

Specifies the name of a parent process or spawned subprocess to which control passes. The process must already exist, be part of your current job, and share the same input stream as your current process.

Process names can contain from 1 to 15 alphanumeric characters. If a connection to the specified process cannot be made, LATCP displays an error message.

If you specify the /PID qualifier, do not use the process name parameter. If you omit the /PID qualifier, you must use the process name parameter.

To display processes, use the DCL SHOW SYSTEM command.

QUALIFIERS

/PID=pid

Specifies the process identification (PID) of the process that will have terminal control. When you specify a PID, you can omit the leading zeros. If you specify a PID, do not use the process name parameter. If you omit the PID qualifier, you must use the process name parameter.

DESCRIPTION

The ATTACH command allows you to connect your input stream to another process. You can use ATTACH to change control from one process to another. For example, you can use ATTACH to change control from LATCP to the DCL command level (see the following example). While using the DCL command level, LATCP remains in a hibernation state until you use ATTACH to return to it.

You cannot use this command if you are logged into a captive account. (A captive account is an account set up to restrict user access to the system. You cannot access the DCL command level from a captive account.) You cannot specify both a process name and the /PID qualifier.

EXAMPLE

```
$  SET PROCESS/NAME="TOP_LEVEL"
$  SPAWN RUN SYS$SYSTEM:LATCP
LATCP>  SHOW NODE/ALL
    .
    .
    .
LATCP>  ATTACH "TOP_LEVEL"
$
```

In this example, the user enters the DCL SPAWN command to create a LATCP subprocess and uses LATCP to display the status of all nodes known to the local node. After using LATCP, the user enters the ATTACH command to return to the DCL command level.

CREATE LINK

Creates the Ethernet links that you want your VMS node to use. You must have OPER privilege to use this command.

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. 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 (_)

You can create a maximum of eight links on your local node. Use the SHOW LINK command for a list of the link names that are defined for your node.

QUALIFIERS

/DECNET
/NODECNET

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 by using a list of possible Ethernet device names. Digital advises that you specify a default device name by defining the LAT$DEVICE logical name.

/LOG
/NOLOG

Specifies whether LATCP displays a message confirming that the link was created. /NOLOG is the default.

/STATE=option

Specifies whether the link will be available for use. There are two options for STATE:

ON	Specifies that the created link will be available for use with the LAT protocol running. This is the default.
OFF	Specifies that the created link will not be available for use.

LATCP
CREATE LINK

DESCRIPTION

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

If you do not explicitly create a link with this command before entering the SET NODE/STATE=ON 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.

Use the SET LINK command to modify link characteristics.

The created link stays in effect until the next time you start the LAT driver.

EXAMPLE

```
LATCP>  CREATE LINK NETWORK_A /DEVICE=XEB0: /STATE=ON
```

The CREATE LINK command in this example creates an Ethernet link named Network_A. It specifies the Ethernet controller device XEB0 for that link. The link will be available for use.

CREATE PORT

Creates a logical port on your local VMS node that connects with a remote device on a terminal server. Alternatively, this command creates a logical port on your local VMS node that connects with a specific service. The service can be offered by a terminal server or associated with one or more dedicated ports on a remote LAT service node.

You must have OPER privilege to use this command.

FORMAT

CREATE PORT *[port-name]*

PARAMETER

port-name

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

If you do not specify the port name, you must specify the /LOGICAL qualifier.

QUALIFIERS

/APPLICATION

Specifies that a logical port on your VMS node is to be an application port. It can be used to connect to a remote device (typically a printer) on a terminal server or to a dedicated port on another LAT service node. The default port type is /APPLICATION.

/DEDICATED

Specifies that a logical port on your local VMS node is dedicated to an application service. When users on a terminal server (or on another VMS node that supports outgoing connections) request a connection to this service name, they are connected to the dedicated 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 node, use the SET PORT /SERVICE command to map this port to a service.

/LOG
/NOLOG

Specifies whether LATCP displays a message confirming that the port was created. The default is /NOLOG.

/LOGICAL=(NAME=logical-name[,TABLE=table][,MODE=mode)

Specifies a logical name to be associated with the actual name of the created port. You must specify a logical name if you do not specify a port name.

You can specify one of the following options for the TABLE keyword:

GROUP	Places the logical name in the group logical name table. You must have GRPNAM or SYSPRV privilege to place the logical name in the group logical name table.
JOB	Places the logical name in the jobwide logical name table.
PROCESS	Places the logical name in the process logical name table. This is the default.
SYSTEM	Places the logical name in the system logical name table. You must have SYSNAM or SYSPRV privilege to place a name in the system logical name table.

You can also specify the name of a specific table. For example, you could specify LNM$PROCESS, which would be the equivalent of specifying PROCESS.

There are also several options for the MODE keyword, as follows:

EXECUTIVE	Creates an executive mode logical name. You must have SYSNAM privilege to create an executive mode logical name.
SUPERVISOR	Creates a supervisor mode logical name. This is the default.
USER	Creates a user mode logical name.

DESCRIPTION

The CREATE PORT command creates a logical LAT port for your local node. You can set up the port as an application port that is later mapped to a remote printer (or other device) on a server, or you can set up the port to be mapped to a dedicated port on a remote LAT service node. See Example ❶.

Alternatively, you can set up the port as a dedicated port for a special service on a LAT service node. See Example ❷.

After creating a port, use the SET PORT command to associate (map) the port with a queue or a service. (See the discussion that follows Example ❶.) Ordinarily, you create and set ports in the LAT site-specific startup procedure, LAT$SYSTARTUP.COM. See Appendix A for more details.

EXAMPLES

❶
```
LATCP>  CREATE PORT LTA22: /APPLICATION
```

The CREATE PORT command in this example creates an application port named LTA22: on a VMS service node. You can associate the port with a specific printer on a terminal server (use the SET PORT /NODE /PORT command) or with a set of printers on a terminal server (use the SET PORT /NODE /SERVICE command. Or, you can associate the port with a dedicated port on a remote VMS service node. In this case, use the SET PORT /NODE /SERVICE command, where the /SERVICE qualifier specifies an application service associated with a dedicated port on the remote node. See the examples for the SET PORT command.

```
2    LATCP>  CREATE PORT LTA21: /DEDICATED
```

The CREATE PORT command in this example creates the port LTA21:. It will be used as a dedicated port that offers a specific service rather than all the resources of the service node.

```
3    LATCP>  CREATE PORT /LOG /APPLICATION /LOGICAL=(NAME=MAIL_PORT,
     TABLE=PROCESS, MODE=SUPERVISOR)
```

The CREATE PORT command in this example creates an application port. It assigns the name of the new port to the specified logical name (MAIL_PORT). The logical is created as a supervisor mode logical name in the LNM$PROCESS_TABLE logical name table. LATCP displays a confirmation message.

CREATE SERVICE

Creates a service on a VMS service node. You must have OPER privilege to use this command.

FORMAT

CREATE SERVICE *[service-name]*

PARAMETER

service-name

Specifies a LAT service name. By default, a service name is the name of the local node you defined with the SET NODE command.

The service name can be from 1 to 16 ASCII characters in length. 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

/APPLICATION

Specifies that the created service is an application service. An application service offers a specific application on the service node rather than all of the resources on the service node. Define a dedicated port for the service, using the CREATE PORT and SET PORT commands.

/IDENTIFICATION["identification-string"]

Describes and identifies a VMS service. Service nodes include the identification string in service announcements. A VMS service node announces its services at regular intervals established with the SET NODE command. The LATCP SHOW NODE and server SHOW NODE displays include this identification string. By default, the identification string is a translation of SYS$ANNOUNCE.

An identification string can have up to 64 ASCII characters. Enclose the string in quotation marks (").

/LOG
/NOLOG

Specifies whether LATCP displays a message confirming that the service was created. The default is /NOLOG.

/STATIC_RATING=rating
/NOSTATIC_RATING

Enables or disables dynamic service ratings. A dynamic service rating means that a LAT algorithm calculates the availability of a service dynamically, based on the overall level of activity of the node that offers the service, the amount of memory, and the processor type. When a terminal server or VMS node requests a connection to a service that

is offered on two or more service nodes, the requesting node selects the service node with the highest (most favorable) service rating. This selection process is called **load balancing**. The dynamic service rating, which is the default, is usually adequate for efficient load balancing on the LAT network.

When you use the /STATIC_RATING qualifier, you disable dynamic service ratings so that you can specify a static (fixed) rating. Use the static rating to direct users away from or toward your node temporarily. Static ratings range from 0 to 255. Specify a low value to make the local service node less likely to be used; specify a high value to make the local service node more likely to be used.

DESCRIPTION

The CREATE SERVICE command creates a service that a VMS service node offers to terminal servers (and VMS nodes that support outgoing connections) on the LAT network. The service can be a general timesharing service that offers all the resources of the service node, or it can be an application service that offers a specific application on the service node. To create an application service, use the /APPLICATION qualifier. In addition, define a dedicated port, using the CREATE PORT and SET PORT commands. Most often, a system manager creates services in LAT$SYSTARTUP.COM, the site-specific LAT configuration procedure. See Appendix A 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.

EXAMPLES

1
```
LATCP>  CREATE SERVICE/STATIC_RATING=195 SALES
```

The CREATE SERVICE command in this example creates the service "SALES" on a VMS service node. This command assigns a static rating of 195 so terminal servers (and VMS nodes that support outgoing connections) can assess the availability of services on the node.

2
```
LATCP>  CREATE SERVICE/APPLICATION GRAPHICS
```

This command creates the service GRAPHICS on the local node. Use the CREATE PORT/DEDICATED and SET PORT/SERVICE=GRAPHICS commands to create a port that is dedicated to this service. Example A–2 in Appendix A includes these commands as an example.

DEFINE/KEY

Assigns a command string to a function key. For example, you can assign the LATCP SHOW NODE command to a function key.

FORMAT

DEFINE/KEY *key-name equivalence-string*

PARAMETERS

key-name

Specifies the name of the function key you want to define. Valid key names are as follows:

Key-name	LK201 keyboard	VT100-type	VT52-tye
PF1	PF1	PF1	Blue
PF2	PF2	PF2	Red
PF3	PF3	PF3	Black
PF4	PF4	PF4	
KP0-KP9	Keypad 0-9	Keypad 0-9	Keypad 0-9
PERIOD	Keypad period (.)	Keypad period (.)	
COMMA	Keypad comma (,)	Keypad comma (,)	
MINUS	Keypad minus (-)	Keypad minus (-)	
ENTER	ENTER	ENTER	ENTER
FIND	Find		
INSERT_HERE	Insert Here		
REMOVE	Remove		
SELECT	Select		
PREV_SCREEN	Prev Screen		
NEXT_SCREEN	Next Screen		
HELP	Help		
DO	Do		
F6-F20	F6-F20		

equivalence-string

Specifies the command string that you want assigned to the function key. To preserve spaces and lowercase characters, enclose the string in quotation marks.

QUALIFIERS

/ECHO
/NOECHO

Specifies whether LATCP displays the command string on your screen when you press the key. The default is /ECHO. You cannot use /NOECHO with the /NOTERMINATE qualifier.

/IF_STATE=state-name

Specifies the state that must be in effect (for example, the GOLD state) for the key definition to take effect. Lets you assign alternate meanings to keys when the specified state is in effect. See the discussion of the /SET_STATE qualifier. If you omit the /IF_STATE qualifier, LATCP uses the current state. The state name is an alphanumeric string. States are established with the /SET_STATE qualifier.

/LOCK_STATE
/NOLOCK_STATE

Specifies that the state set by the /SET_STATE qualifier remain in effect until explicitly changed. If you use the /NOLOCK_STATE qualifier, the state set by /SET_STATE is in effect only for the next defineable key that you press or for the next read terminating character (such as RETURN or CTRL/Z) that you type.

The default is /NOLOCK_STATE. The /LOCK_STATE qualifier can be specified only with the /SET_STATE qualifier.

/LOG
/NOLOG

Specifies whether LATCP displays a message confirming that the command was executed. The default is /NOLOG.

/SET_STATE=state-name

Causes the specified state to be set when you press the defined key. The state name can be any alphanumeric string (for example, GOLD). Use the DEFINE/KEY/IF_STATE=state-name command to associate new meanings for keys when the specified state is set. See the example for the DEFINE /KEY command.

If you omit the /SET_STATE qualifier, the current state that was locked remains in effect.

/TERMINATE
/NOTERMINATE

Specifies whether the command string will be terminated (processed) when you press the function key. The default is /NOTERMINATE, which allows you to press other keys before the command string is processed. Pressing RETURN has the same effect as using /TERMINATE.

The /NOTERMINATE qualifier allows you to create key definitions that insert text into command lines, after prompts, or into other text that you are typing.

DESCRIPTION

The DEFINE/KEY command assigns a command string to a function key so that when you press that key, the command is executed.

EXAMPLE

```
LATCP>  DEFINE/KEY PF4 "SHOW NODE " /NOTERMINATE/SET_STATE=GOLD
LATCP>  DEFINE/KEY PF4 "/ALL"/IF_STATE=GOLD/TERMINATE
```

The first DEFINE/KEY command in this example assigns the SHOW NODE command to function key PF4. To process the SHOW NODE command, you must press RETURN after pressing PF4. Note the space after the word NODE in the first DEFINE/KEY command. This space allows you to enter a node name after pressing PF4. When you press RETURN, the SHOW NODE command is processed. If the space is omitted, LATCP would not recognize the command (SHOW NODE). The state is set to GOLD, to be in effect for the next key that you press.

The second DEFINE/KEY command defines the use of the PF4 key when the keypad is in the GOLD state. When you press PF4 twice, the SHOW NODE/ALL command is processed.

DELETE LINK

Deletes a logical link from a VMS node. You must have OPER privilege to use this command.

FORMAT

DELETE LINK *link-name*

PARAMETER

link-name

Specifies the name of the link that you want to delete.

The link must have been created with the CREATE LINK command. Use the SHOW LINK command for a list of the links that are defined for your node.

QUALIFIERS

/LOG
/NOLOG

Specifies whether LATCP displays a message confirming that the link was deleted. The default is /NOLOG.

DESCRIPTION

The DELETE LINK command stops any active sessions on the link and then deletes this link from your node.

EXAMPLE

```
LATCP>  DELETE LINK NETWORK_A /LOG
```

The DELETE LINK command in this example deletes the link NETWORK_A. The link was created with the CREATE LINK command.

DELETE PORT

Deletes a logical port from a VMS node. You must have OPER privilege to use this command.

FORMAT

DELETE PORT *port-name*

PARAMETER

port-name

Specifies the name of the application port or the dedicated port that you want to delete. An application 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 PORT command for a list of the application ports and the dedicated ports that are defined for your service node.

QUALIFIERS

/LOG
/NOLOG

Specifies whether LATCP displays a message confirming that the port was deleted. The default is /NOLOG.

DESCRIPTION

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

EXAMPLE

```
LATCP>  DELETE PORT LTA27:
```

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

DELETE SERVICE

Deletes a service that your VMS service node currently offers. You must have OPER privilege to use this command.

FORMAT

DELETE SERVICE *service-name*

PARAMETER

service-name
Specifies the name of the service, as displayed by the SHOW SERVICE command.

QUALIFIERS

/LOG
/NOLOG
Specifies whether LATCP displays a message confirming that the service was deleted. The default is /NOLOG.

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

```
LATCP>  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

```
LATCP>  EXIT
```

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

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

```
LATCP>  HELP SET PORT
```

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

RECALL

Displays previously entered LATCP commands on the screen so that you can execute them again.

FORMAT

RECALL *[command-specifier]*

PARAMETER

command-specifier

Specifies the number or the first several characters of the LATCP command you want to recall. Command numbers can range from 1 to 20. The most recently entered command is number 1.

If you do not specify the command specifier, you must use the /ALL qualifier. Use the /ALL qualifier to display all the commands in the RECALL buffer, along with their command number so that you can determine the number of the command that you want to recall.

If you do not specify the command specifier nor the /ALL qualifier, LATCP displays the last command.

QUALIFIERS

/ALL

Specifies that LATCP display all the commands in the RECALL buffer. LATCP displays the number of each command.

DESCRIPTION

When you enter a LATCP command, LATCP stores it in a RECALL buffer for later use with the RECALL command. The RECALL command itself is never stored in the RECALL buffer.

When you use the RECALL command, LATCP displays the recalled command but does not process it. If you want the command processed as it appears, press RETURN. You can use the command line editing facility to make minor changes in the command line and then press RETURN to process the revised version of the command.

EXAMPLES

1

```
LATCP>  RECALL 2
```

In this example, the RECALL command recalls the second-to-last command you entered.

2

```
LATCP>  RECALL SET
```

In this example, the RECALL command recalls the last SET command you entered.

REFRESH

Refreshes the display screen so that any output from some other source (such as a broadcast message from a terminal server user) is erased from the screen.

FORMAT REFRESH

DESCRIPTION

Use the REFRESH command to refresh your display screen after output from other sources has overwritten the display screen. For example, if a broadcast message from a terminal server user displays on your screen, use the REFRESH screen to erase the broadcast message from the display. By default, you can refresh your screen by pressing CTRL/W at the LATCP prompt.

EXAMPLE

```
LATCP>  REFRESH
```

In this example, the REFRESH command refreshes the display on your screen.

SET LINK

Changes the characteristics of Ethernet links. You must have OPER privilege to use this command.

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. 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 SHOW LINK command displays the names of the links defined for a VMS node.

COMMAND QUALIFIERS

/LOG
/NOLOG

Specifies whether LATCP displays a message confirming that the link's characteristics were modified. The default is /NOLOG.

/STATE=option

Specifies availability of the link for use. There are two options for STATE:

ON	Specifies that the link will be available for use with the LAT protocol running. This is the default.
OFF	Specifies that the link will not be available for use.

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/STATE=ON command executes, it creates a default link named LAT$LINK.

EXAMPLE

```
LATCP>  SET LINK NETWORK_A /LOG
```

The SET LINK command in this example directs LATCP to start the controller for link Network_A and to then display a confirmation message.

SET NODE

Specifies the LAT characteristics of your local VMS node. You must have OPER privilege to use this command.

FORMAT

SET NODE *[node-name]*

PARAMETER

node-name

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

/CIRCUIT_TIMER=msecs

Allows you to control the interval in milliseconds (ms) between messages sent from the local node to other service nodes or terminal servers while a connection to those nodes are active. Use this qualifier only if your node allows outgoing connections (/CONNECTIONS=OUTGOING_ONLY or /CONNECTIONS=BOTH).

A low value for the interval decreases the response time for the port but increases the demand on service nodes. Set the circuit timer in the range of 10 to 1000 milliseconds. The default value of 80 milliseconds gives a generally acceptable response time while creating a moderately low overhead on the service nodes. The value for the circuit timer is effective only as a multiple of the line clock (the power line frequency):

- 16 2/3 ms per clock tick for 60 hertz
- 20 ms per clock tick for 50 hertz

/CONNECTIONS=option

Allows you to specify the type of connections permissable on the local node. There are four options for CONNECTIONS:

INCOMING_ONLY	Specifies that the local node permits incoming connections only.

OUTGOING_ONLY	Specifies that the local node permits outgoing connections only. Specify this on systems that can tolerate the overhead associated with outgoing connections, such as standalone systems.
BOTH	Specifies that the local node permit both incoming and outgoing connections. Specify this on systems that can tolerate the overhead associated with outgoing connections, such as standalone systems.
NONE	Specifies that the local node disallow both incoming and outgoing connections.

/CPU_RATING=cpu-power
/NOCPU_RATING

The /CPU_RATING qualifier assigns your local VMS node a rating that represents the power of your node's CPU (central processing unit) relative to other CPUs in the LAN. The value of *cpu-power* can range from 1 (for a CPU with the lowest power) to 100 (for a CPU with the highest power).

The local node's LAT driver uses this value to calculate the dynamic service rating for each service offered on the local node. When a terminal server or VMS node requests a connection to a service that is offered on the local node and one or more other service nodes, the requesting node selects the service node with the highest (most favorable) service rating. This selection process is called load balancing.

Specify the /CPU_RATING qualifier to influence the service ratings calculated for services on your node. If you specify a high value for cpu_power, the LAT driver will calculate a relatively high service rating for services on your node (service ratings as high as 255 are possible). If you specify a low value, the LAT driver will calculate relatively low service ratings; connections will most likely be made to the same service that is offered on other nodes. In either case, the LAT driver can calculate a greater range of values for dynamic service ratings (the entire range from (0 to 255). Consequently, the ratings will more accurately reflect the availability of the service node.

By default, the LAT driver calculates a dynamic rating based on the estimated CPU power of the local node. So, if you do not modify the default by specifying the /CPU_RATING qualifier, or if you specify the /NOCPU_RATING qualifier, services offered on the local node will generally have lower ratings than services offered on nodes having more powerful CPUs. Other factors involved in the rating calculation, such as available memory and current CPU usage, can further reduce the ratings for local services.

The following example illustrates one of the major benefits of using the /CPU_RATING qualifier. If your local node has low CPU power (relative to the range of CPU powers available with VAX processors) but is the most powerful CPU that is usually available, you can assign a high value to the /CPU_RATING qualifier. Then, higher service ratings will be given to the services offered on your node (as high as 255, the maximum value for service ratings). For example, if your node is one of several VAX 11/780s in a cluster which contains only VAX 11/750s and VAX 11/780s, assign a high value to the /CPU_RATING qualifier. Then the services offered on your node will have higher service ratings.

If you do not specify the /CPU_RATING qualifier in the previous example, the service ratings calculated for the VAX 11/780 will tend to be low, far below the maximum possible value of 255.

/DEVICE_SEED[=value]

The /DEVICE_SEED qualifier overrides the default lower boundary for new LTA devices. The default is 0, and the maximum is 9999.

By default, if you do not specify a parameter to the LATCP CREATE PORT command, LTA device unit numbers for LTA ports fall in the following range (starting at the lower boundary):

```
( (MAX unit / 2) - 1 ) < n < ( MAX unit )
```

where:

- *n* is the device unit number of the LTA device (LTAn:).
- *MAX unit* is the maximum LTA device unit number. The default is 9999 (the absolute maximum). You can set this value using the the /UNIT_NUMBER_MAXIMUM qualifier.

  The channel numbers fall in this same range when ports are created by assigning a channel to LTA0: with the $ASSIGN system service.

/GROUPS=option[,...]

Gives the listed groups access to services offered on your local node or prevents the listed groups from accessing services offered on your local node, depending on the options used.

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 and VMS nodes supporting outgoing connections belong to group 0. If you enter one group code, you can omit the parentheses. Use the SHOW NODE command for a list of the groups enabled for your service node.

There are several options for the /GROUPS qualifier. For each option described, there are two ways to specify more than one group:

- List them separated by commas
- Specify a range

See Example ❷ for the SET NODE command.

ENABLE=group-code[,...]	Gives the listed groups access to your service node.
DISABLE=group-code[,...]	Prevents the listed groups from accessing your service node. The listed groups had been enabled previously for access to your node.

ENABLE=group-code[,...], DISABLE=group-code[,...]	This option lets you enable certain groups and disable other groups in one command line: gives access to the groups listed with the ENABLE option, and removes access from the groups listed with the DISABLE option. Enclose both ENABLE and DISABLE in parentheses. For example, /GROUP=(ENABLE=(10,12),DISABLE=(1-30)).

/IDENTIFICATION["identification-string"]

Describes and identifies a VMS node. Service nodes include the identification string in service announcements. A VMS service node announces its services at regular intervals established with the SET NODE command. The LATCP SHOW NODE and server SHOW NODE displays include this identification string. By default, the identification string is the translation of SYS$ANNOUNCE.

An identification string can have up to 64 ASCII characters. Enclose the string in quotation marks (").

/KEEPALIVE_TIMER=secs

Allows you to control the maximum interval between idle run messages sent by your local node to another service node to which it has a LAT connection. The interval is in seconds. Your node sends these messages when no other traffic is being generated over the virtual circuit. If the service node acknowledges these messages, your node will continue to monitor the status of the circuit. If your node does not receive acknowledgement, it responds as if the circuit is down.

Use this qualifier only if your node allows outgoing connections (/CONNECTIONS=OUTGOING_ONLY or /CONNECTIONS=BOTH).

The default value is 20. Digital recommends this value for normal Ethernet environments. For a heavily loaded Ethernet, consider using a higher value. Set the timer in the range of 1 to 255. For applications that require quick notification and possible failover of a service node failure, use a lower value.

/LOG
/NOLOG

Specifies whether LATCP displays a message confirming that the node's characteristics were modified. The default is /NOLOG.

/MULTICAST_TIMER=secs

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

/NODE_LIMIT=value
/NONODE_LIMIT

Specifies the maximum number of service nodes that your local node can store in its service and node database. Use this qualifier only if your node allows outgoing connections (/CONNECTIONS=OUTGOING_ONLY or /CONNECTIONS=BOTH).

When the database reaches the node limit, no more nodes are added to the database when your local node receives service announcement messages. You can ensure that the node limit is not reached by using the /USER_GROUPS qualifier to restrict access from the local node to other service nodes on the network.

A value of 0 can also be used to mean no limit.

/RETRANSMIT_LIMIT=count

Specifies the number of times your local node repeats transmission of a message to a service node after a transmission fails. If the transmission is still unsuccessful after these attempts, the virtual circuit between your local node and the service node terminates, along with all sessions associated with the virtual circuit.

Use this qualifier only if your node allows outgoing connections (/CONNECTIONS=OUTGOING_ONLY or /CONNECTIONS=BOTH).

Specify a value in the range of 1 to 255. The default is 20. The value you choose depends on the type of physical link used for your network, as well as the amount of traffic on the network. See your network manager for a suggested value.

/SERVICE_RESPONDER
/NOSERVICE_RESPONDER

Specifies whether your VMS system responds to special LAT multicast messages that request service information. Some terminal servers do not have their own service and node database. When a user on such a terminal server requests a connection to a service, the server sends a LAT multicast message requesting names of nodes that offer the requested service. **Service responder** nodes reply with the requested information.

If you specify /SERVICE_RESPONDER, your system responds to the special LAT multicast messages. Only one or two nodes in the LAN should be set up as service responder nodes. The nodes should have the largest databases in the LAN. Use this option only if your node allows outgoing connections (/CONNECTIONS=OUTGOING_ONLY or /CONNECTIONS=BOTH).

If you specify /NOSERVICE_RESPONDER, your system does not respond to the special LAT multicast messages. This is the default.

/SESSION_LIMIT=option

Specifies the maximum number of simultaneous sessions across all local-access ports. This limit does not affect the use of dedicated and application ports. It affects interactive port creation only, limiting the amount of resources consumed by interactive users creating new sessions.

There are several options for the /SESSION_LIMIT qualifier:

INCOMING=value	Sets the session limit for incoming connections only.
OUTGOING=value	Sets the session limit for outgoing connections only.

INCOMING=value,OUTGOING=value	Sets the limit for both outgoing and incoming connections. Enclose this in parentheses. For example, /SESSION_LIMIT=(INCOMING=20, OUTGOING=25)

- A high limit allows users to have more sessions but increases memory utilization on your local node.
- A low limit decreases memory utilization on your local node but limits user access to services on the network.

If the limit is reached, interactive users cannot create new sessions. In this case, you need to increase the session limit or disconnect any connections that are no longer being used.

Specify a value in the range of 0 to 255. Specifying 0 leaves no limit on the number of sessions that can be created. To prevent sessions from being created, use the /CONNECTIONS qualifier.

/STATE=option

Specifies whether LAT connections are allowed. There are three options for STATE:

ON	Starts the LAT port driver (and LAT protocol software).
OFF	Stops the LAT port driver (and LAT protocol software) on your node. Any existing LAT connections are aborted. Any characteristics that you changed or set with LATCP are lost. To start the LAT protocol on your node again, invoke LAT$SYSTARTUP.COM as explained in Appendix A. The LAT characteristics defined in LAT$SYSTARTUP.COM will take effect.
SHUT	Specifies that new LAT connections cannot be created on your local node, but existing connections may continue. The LAT protocol continues running only until the last active session disconnects. At that time, your node changes to the OFF state.

/UNIT_NUMBER_MAXIMUM=value

Specifies the maximum unit number for a LAT device. For example, if you specify 40, then LTA40: will be the device with the highest unit number. Specify a value that is high enough to accommodate all devices that may be in use simultaneously. When the number of devices in use exceeds the value you specify, the system gives certain LAT devices unit numbers that exceed your maximum.

/USER_GROUPS=option[,...]

Restricts access (from the local node) to service nodes in the network that belong to the specified groups. Your local node can access only those service nodes associated with the user groups specified. The /USER_GROUPS qualifier also serves to limit the number of nodes stored in your node's node database. (The local node only stores information about the nodes and services that belong to at least one of the specified user groups.) By default, all LAT service nodes belong to group 0.

This qualifier affects your local node when outgoing connections are enabled (/CONNECTIONS=OUTGOING_ONLY or /CONNECTIONS=BOTH).

Use the SHOW NODE command for a list of the user groups (service groups) enabled for your node.

There are several options for the /USER_GROUPS qualifier. For each option described here, there are two ways to specify more than one group:

- List them separated by commas
- Specify a range.

See the example that follows.

ENABLE=group-code[,...]	Gives your node access to the listed user groups.
DISABLE=group-code[,...]	Prevents your node from accessing the listed groups. The listed groups were enabled previously.
ENABLE=group-code[,...], DISABLE=group-code[,...]	This option lets you enable certain groups and disable other groups in one command line: gives your node access to the groups listed with the ENABLE option, and prevents your node from accessing the groups listed with the DISABLE option. Enclose both ENABLE and DISABLE in parentheses. For example, /GROUP=(ENABLE=(10,12),DISABLE=(1-30)).

DESCRIPTION

The SET NODE command, which is typically executed in the site-specific LAT configuration command procedure, LAT$SYSTARTUP.COM, allows you to specify such characteristics as:

- Node name
- Node identification
- Service and user groups
- Timing of service announcements
- The maximum number of LAT sessions allowed simultaneously on the node
- The maximum number of outgoing sessions and incoming interactive sessions

Because LATCP commands change characteristics dynamically (that is, the commands take effect immediately), you can use the SET NODE command any time the LAT port driver is active. These changes stay in effect until the LAT port driver stops. To make sure the changes take effect when you start the LAT port driver again, edit LAT$SYSTARTUP.COM to include these changes. Start the LAT port driver by invoking LAT$SYSTARTUP.COM. See Appendix A. The description of a LAT network in the *Guide to Setting Up a VMS System* describes a VMS service node.

This command must be executed first (after LTDRIVER is loaded and the LATACP is started) in order to execute other management commands.

EXAMPLES

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

The SET NODE command in this example specifies node name DUKE for your local VMS node. The identification string "NODE DUKE, SALES VAXCLUSTER" is multicast from node DUKE.

2
```
LATCP>  SET NODE /MULTICAST_TIMER=50 /GROUPS=(ENABLE=(1-3,8,11),DISABLE=5)
```

The SET NODE command in this example causes your local node to send multicast messages every 50 seconds to announce DUKE's services to terminal servers. The command also enables groups 1, 2, 3, 8, and 11 for access to the local node, and it disables group 5 from accessing the local node. Group 5 had been previously enabled.

3
```
LATCP>  SET NODE /CONNECTIONS=BOTH /USER_GROUPS=(ENABLE=(24,121-127),DISABLE=0)
```

The SET NODE command in this example sets up your local node to allow both incoming and outgoing connections. Users on your local node can access those service nodes belonging to user groups 24 and 121 through 127. Users cannot access service nodes in user group 0.

4
```
LATCP>  SET NODE /CIRCUIT_TIMER=80 /KEEPALIVE_TIMER=20 -
_LATCP>  /RETRANSMIT_LIMIT=20 /CONNECTIONS=BOTH /MULTICAST_TIMER=60-
_LATCP>  /GROUPS=(DISABLE=0,ENABLE=73) /SESSION_LIMIT=(OUTGOING=10,INCOMING=0)
```

The SET NODE command in this example sets many characteristics at once for node DUKE.

SET PORT

Logically associates a logical port on the local VMS node with a remote port on a terminal server that supports a device. Alternatively, it associates a logical port on the local VMS node with a specific service. The service can be offered by a terminal server or associated with one or more dedicated ports on a remote LAT service node.

You must have OPER privilege to use this command.

FORMAT

SET PORT *port-name*

PARAMETER

port-name

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

QUALIFIERS

/APPLICATION

Specifies that a port on the local VMS node is an application port, logically associated with a port on a terminal server or a dedicated port on another LAT service node. 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. See the description of configuring remote printers on a terminal server in the *Guide to Maintaining a VMS System*.

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

The default port type is /APPLICATION.

/DEDICATED

Specifies that a logical port on your local VMS node is dedicated to an application service. The /DEDICATED qualifier requires the /SERVICE qualifier.

To set up an application service for a logical port on a LAT service node:

1. Create the service (CREATE SERVICE/APPLICATION) and define the dedicated port (CREATE PORT/DEDICATED). You can include these commands in LAT$SYSTARTUP.COM.
2. Start the application program. Within the program, allocate dedicated ports with the same name as those defined in LAT$SYSTARTUP.COM.

/LOG
/NOLOG

Specifies whether LATCP displays a message confirming that the port's characteristics were modified. The default is /NOLOG.

/NODE=remote-node-name

Specifies the name of a terminal server (or a remote VMS node that supports outgoing connections) to be logically associated with the specified application port on your VMS node. The server supports a remote device. Note that you can set up an application port on your local VMS node and associate the port with a dedicated port on a remote LAT service node. The remote port is dedicated to an application service.

/PORT=remote-port-name

Specifies the name of the remote port on a terminal server that supports a remote device, or specifies the name of a remote port dedicated to a special service on a remote LAT service node. In either case, the remote port is logically associated with the specified application port on your local VMS node.

/QUEUED
/NOQUEUED

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 the terminal server, then the server queues the remote request. If you do not want your remote requests to be queued on the server, specify /NOQUEUED.

/SERVICE=service-name

Specifies either of the following:

- The name of the remote service offered at a terminal server port that will be associated with the specified application port (/APPLICATION) on the local node
- A service name for an application program being offered on a dedicated port (/DEDICATED) on a LAT 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 locally 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 associates an application port on your local VMS node to a port or service on a terminal server. When you associate an application port with a service on a terminal server, you allow access to any of the ports (printers) represented by that service. See Example ❶ and Example ❷. The application port must have been created with the CREATE PORT/APPLICATION command.

The SET PORT command also can associate a dedicated port on the local node to an application service offered locally. The service must already exist. See Example ❸. Use the /DEDICATED and /SERVICE qualifiers with the SET PORT command.

The SET PORT command also can associate an application port on your local VMS node to an application service associated with one or more dedicated ports on a remote LAT service node. This service is offered to users on terminal servers or on VMS nodes that support outgoing connections. See Example ❹. The dedicated port must have been created with the CREATE PORT/DEDICATED command.

EXAMPLES

See the examples for the SHOW PORT command for displays that reflect the changes made by the following SET PORT command examples.

1
```
LATCP>  SET PORT LTA22: /APPLICATION /NODE=TS33EW /PORT=LN02
```

The SET PORT command in this example sets up port LTA22: as an application port to be associated with the port named LN02 on the terminal server named TS33EW. This command associates port LTA22: with a specific printer on the server. In the next example, the SET PORT command associates a port with a set of printers (designated by the service name PRINTER) on a terminal server.

2
```
LATCP>  SET PORT LTA19: /APPLICATION /NODE=TLAT1 /SERVICE=PRINTER /QUEUED
```

The SET PORT command in this example shows how to associate a local logical port with a service (several printers) on a terminal server. The command associates the application port LTA19: 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 can queue the remote connection request if all ports offering the service are in use. See the description of print operations in the *Guide to Maintaining a VMS System* for information on setting up print queues.

3
```
LATCP>  SET PORT LTA21: /DEDICATED /SERVICE=GRAPHICS
```

The SET PORT command in this example specifies that the application port LTA21: on the local VMS service node offers the service GRAPHICS to users on terminal servers or on VMS nodes that support outgoing connections. GRAPHICS is a particular utility or application program.

4
```
LATCP>  SET PORT MAIL_PORT /SERVICE=MAIL/NODE=BIGVMS
```

The SET PORT command in this example associates the port whose logical name is MAIL_PORT with the dedicated service MAIL on remote node BIGVMS. The port logically named MAIL_PORT was created with the CREATE PORT command (see Example ❸ in the discussion of the CREATE PORT command). The logical port could also have been created with a VMS DCL ASSIGN or DEFINE command. On node BIGVMS, a port must be dedicated to the service MAIL by using the SET PORT port-name /DEDICATED/SERVICE=MAIL command.

SET SERVICE

Dynamically changes the characteristics of a locally offered service. You must have OPER privilege to use this command.

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 name of the local node you defined using the SET NODE command.

QUALIFIERS

/APPLICATION

Sets up the service as an application service. An application service offers a specific application on the service node rather than all of the resources on the service node. Define a dedicated port for the service, using the CREATE PORT and SET PORT commands.

/IDENTIFICATION["identification-string"]

Describes and identifies a VMS service. Service nodes include the identification string in service announcements. A VMS service node announces its services at regular intervals established with the SET NODE command. The LATCP SHOW NODE and server SHOW NODE displays include this identification string.

By default, the identification string is the translation of SYS$ANNOUNCE. A VMS service node announces its services at regular intervals established with the SET NODE command.

An identification string can have up to 64 ASCII characters. Enclose the string in quotation marks.

/LOG
/NOLOG

Specifies whether or not to display a message confirming that the command was executed. The default is /NOLOG.

/STATIC_RATING=rating
/NOSTATIC_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 dynamically, based on the overall level of activity of the node that offers the service, the amount of memory, and the processor type. When a terminal server or VMS node requests a connection to a service that is offered on two or more service nodes, the requesting node selects the service node with the highest (most favorable) service rating. This selection process is called load balancing.

When you use the /STATIC_RATING qualifier, you disable dynamic service ratings so that you can specify a static rating. Use the static rating to direct users away from or toward your node temporarily. Static ratings range from 0 to 255. Specify a low value to make your node less likely to be used; specify a high value to make the node more likely to be used.

DESCRIPTION

The SET SERVICE command dynamically changes the characteristics of a service that you created with the CREATE SERVICE command.

EXAMPLE

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

The SET SERVICE command in this example specifies a new identification string "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 LINK

Displays the status and LAT characteristics of links on the local VMS node.

FORMAT

SHOW LINK *[link-name]*

PARAMETER

link-name

Specifies the name for an Ethernet link. A link name may have up to 16 ASCII characters.

If you do not specify a link name, LATCP displays information about all links currently defined for the VMS node.

QUALIFIERS

/BRIEF

Displays the device name and state of the link. This is the default display.

/COUNTERS

Displays the device counters kept for the link. Do not use the /BRIEF or /FULL qualifiers with this qualifier. The following table lists and describes the counters:

Counter	Description
Messages received	The total number of messages received over the link.
Multicast messages received	The total number of multicast messages received over the link.
Bytes received	The total number of bytes of information received.
Multicast bytes received	The total number of multicast bytes received.
Receive errors	The total number of errors occuring while receiving messages.
Data overrun	The total number of bytes lost on the link's device because the local node's input buffers were full. A nonzero value might indicate noisy lines, a bad device, a busy or poorly tuned system (not enough resources allocated), or a hardware problem with another device on the Ethernet.
User buffer unavailable	The total number of times the system was unable to allocate a buffer in the user's process space.

Counter	Description
System buffer unavailable	The total number of times the system was unable to allocate a buffer in the system space.
Local buffer errors	The total number of times the local node did not have a system buffer available for the network device to copy an Ethernet message into. A nonzero value might indicate that the local node has too many system buffers dedicated to maintaining a large number of virtual circuits, sessions, or queued connections and not enough for heavy network traffic situations.
Transmit CDC failures	The total number of carrier detect check errors; that is, the number of times the local node failed to detect that another Ethernet station was already transmitting when the local node began transmitting.
Messages sent	The total number of messages sent over the link since the counters were last reset.
Multicast messages sent	The total number of multicast messages sent.
Bytes sent	The total number of bytes of information sent.
Multicast bytes sent	The total number of bytes of multicast message sent.
Transmit errors	The total number of times the link device attempted to transmit data and encountered an error while trying to access the part of the local node's memory that contains the data.
Messages transmitted: - single collision - multiple collision - initially deferred	The total number of single and multiple collisions occurring during transmission, and the number of messages initially deferred during transmission.

/FULL

Displays the device name, state, and datalink address of the link and indicates whether the DECnet address is enabled.

DESCRIPTION

This command displays information about the specified link or all links if you do not specify a link. Depending on the qualifier you use with the SHOW LINK command, you can display a link's device name, state, datalink address, DECnet address or counters.

EXAMPLES

1 LATCP> SHOW LINK/FULL NETWORK_A

The SHOW LINK command in this example produces the following display of information about link NETWORK_A:

```
Link Name:     NETWORK_A              Datalink Address:  08-00-2B-10-12-E3
Device Name:   _ESA7:                 DECnet Address:    Disabled
Link State:    On
```

The display in this example gives the device name of link NETWORK_A and the device's hardware address. The link is in the On state.

2 LATCP> SHOW LINK LINK_A/COUNTERS

The SHOW LINK command in this example produces the following display of counters for link LINK_A:

```
Link Name:    LINK_A
Device Name:  _ETA6:

Seconds Since Zeroed:             6724
Messages Received:              184099     Messages Sent:               79922
Multicast Msgs Received:        106320     Multicast Msgs Sent:          2975
Bytes Received:               41485109     Bytes Sent:                9552010
Multicast Bytes Received:     10470760     Multicast Bytes Sent:       246635
Receive Errors:                       0    Transmit Errors:                 0
Data Overrun:                         0
User Buffer Unavailable:              0    Messages Transmitted -
System Buffer Unavailable:           19      Single Collision:           1011
Local Buffer Errors:                  0      Multiple Collisions:        1510
Transmit CDC Failure:                 0      Initially Deferred:         4106
```

SHOW NODE

Displays the status and LAT characteristics of a VMS node.

FORMAT

SHOW NODE *[node-name]*

PARAMETER

node-name

Specifies the name of the node for which information is displayed. If you do not specify a node name, LATCP displays information about the local node.

QUALIFIERS

/ALL

Displays information about all nodes known to your local node. Use the /FULL or /BRIEF qualifier. The /BRIEF qualifier is the default.

/BRIEF

Displays the node status and identification string. This is the default if you specify the /ALL qualifier.

/COUNTERS

Displays the counters kept for the node. Do not use the /BRIEF or /FULL qualifier with this qualifier. The following table lists and describes the counters displayed with SHOW NODE/COUNTERS.

Table LAT–2 LAT Node Counters

Counter	Description
Messages received	The total number of LAT messages successfully received by the local node. If you specified a remote node with the SHOW NODE command, the number of messages received from that remote node.
Multicast messages received	The total number of multicast messages received by the local node.
Messages transmitted	The total number of LAT messages successfully transmitted by the local node. If you specified a remote node with the SHOW NODE command, the number of messages transmitted to the specified remote node.
Multicast messages transmitted	The total number of multicast messages transmitted by the local node.

(continued on next page)

Table LAT–2 (Cont.) LAT Node Counters

Counter	Description
Slots received	The total number of LAT slots received by the local node. If you specified a remote node with the SHOW NODE command, the number of slots received from that remote node. A slot is a message segment containing information corresponding to a single session.
Slots transmitted	The total number of LAT slots successfully transmitted by the local node. If you specified a remote node with the SHOW NODE command, the number of slots transmitted to the specified remote node.
Bytes received	The total number of bytes received by the local node. If you specified a remote node with the SHOW NODE command, the number of bytes transmitted to the specified remote node.
Multicast bytes received	The total number of multicast bytes received by the local node.
Bytes transmitted	The total number of bytes transmitted by the local node. If you specified a remote node with the SHOW NODE command, the number of bytes transmitted to the specified remote node.
Multicast bytes transmitted	The total number of multicast bytes transmitted by the local node.
Resource Errors	The number of times memory was unavailable to perform an operation. This counter will be incremented if the local node is listening to multicast messages but does not have enough room to cache the information in a multicast message.
No transmit buffer	The total number of times no buffer was available on the local node for transmission.
Multiple node addresses	The total number of times that a node announced itself with a physical address different from that in a previous announcement.
Duplicates received	The total number of duplicate messages that are received by the local node. If you specify a remote node with the SHOW NODE command, this counter indicates the number of duplicate messages received from that remote node. This counter can indicate a system slowdown.

(continued on next page)

Table LAT–2 (Cont.) LAT Node Counters

Counter	Description
Messages retransmitted	The total number of LAT messages that the local node retransmitted because they were not acknowledged by terminal servers (or VMS nodes that support outgoing connections). If you specify a remote node with the SHOW NODE command, this counter indicates the number of messages retransmitted to that remote node.
Illegal messages received	The total number of invalidly formatted messages that the local node received. If you specified a remote node, the number of invalidly formatted messages that the local node received from that remote node. Illegal messages are grouped into several types of protocol errors, which are listed at the end of this table.
Illegal slots received	The total number of LAT slots that the local node received. If you specified a remote node, the number of slots that the local node received from that remote node.
Solicitations accepted	The total number of times the local node has accepted solicitations from other nodes. If you specify a remote node with the SHOW NODE command, this counter indicates the number of times the local node has accepted solicitations from that remote node.
Solicitations rejected	The total number of times the local node has rejected soliciations from other nodes. If you specify a remote node with the SHOW NODE command, this counter indicates the number of times the local node has rejected solicitations from that remote node.
Virtual circuit timeouts	The total number of times a circuit to a another node timed out, indicating that the remote node failed to send a valid message in the required time span. If you specify a remote node with the SHOW NODE command, this counter indicates the number of times the local node timed out a connection to that remote node.
Discarded output bytes	The total 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.

The protocol errors that are counted as illegal messages are as follows. These protocol error messages are displayed if their associated counter is greater than zero.

- Invalid message type received

- Invalid start message received
- Invalid sequence number received in start message
- Zero node index received
- Node circuit index out of range
- Node circuit sequence invalid
- Node circuit index no longer valid
- Circuit was forced to halt
- Invalid server slot index
- Invalid node slot index
- Invalid credit field or too many credits used
- Repeat create of slot by server
- Repeat disconnect of slot by server

/FULL

Displays the node's status, identification string, LAT protocol version, DECnet address, and the values of the node's characteristics. This is the default except when you specify the /ALL qualifier.

DESCRIPTION

This command displays information about a specified node or, if you do not specify a node name, about your local node. With the /ALL qualifier, the SHOW NODE command displays information about all nodes known to your local node. Depending on the qualifiers you use, you can display node counters, node status, the node identification string, the LAT protocol version on the node, and the values set for the node's characteristics.

EXAMPLES

1 `LATCP>  SHOW NODE/FULL`

The SHOW NODE command in this example produces the following display of information about the local node:

```
Node Name:   LTC                            LAT Protocol Version:      5.2
Node State:  On
Node Ident:  LTC - Engineering Development

Incoming Connections:  Enabled              Incoming Session Limit:   None
Outgoing Connections:  Enabled              Outgoing Session Limit:   None
Service Responder:     Disabled

Circuit Timer (msec):        80             Keepalive Timer (sec):      20
Retransmit Limit (msg):      20             Node Limit (nodes):       None
Multicast Timer (sec):       20             CPU Rating:                  8

User Groups:     43, 73
Service Groups:  7-9, 13, 23, 40, 43, 45, 66, 72-73, 89, 120-127, 248-255

Service Name     Status      Rating  Identification
LTVMS            Available     31 D  .
```

This display indicates that the local node LTC is in the On state, which means LAT connections can be created on the node. LTC is running Version 5.4-1 of the LAT protocol. The identification of the node is "LTC - Engineering Development." Because this is the local node, the display does not give the address of an Ethernet device. Use the SHOW LINK command to find addresses of devices on the local node. The display for the status of remote nodes, as shown in Example ❷, gives the Ethernet address of that node.

Both incoming and outgoing connections can be made on node LTC, and there is no limit on the number of sessions. The display indicates the values of various timers and lists the groups that are enabled. Users on the local node can access service nodes belonging to user groups 43 and 73. Locally offered services can be accessed by nodes belonging to the service groups listed.

The display indicates that the CPU rating of the local node is 8. The display shows that the node offers a service named LTVMS. This service is available and its rating is 31 D (dynamic). (An "S" would indicate the rating is static.)

```
2    LATCP>  SHOW NODE/FULL RWWUP
```

The SHOW NODE command in this example produces the following display about the remote node RWWUP:

```
Node Name:   RWWUP                          LAT Protocol Version:      5.2
Node State:  Reachable                      Address:     AA-00-04-00-11-10
Node Ident:  .

Incoming Connections:  Enabled

Circuit Timer (msec):        80
Multicast Timer (sec):       20

Service Groups:  7, 13, 42-43, 45, 66, 70-72, 75-82, 88-89

Service Name     Status      Rating  Identification
NAC              Available     28    .
SYSMGR           Available     28    .
```

This display indicates that remote node RWWUP is reachable and runs version 5.4-1 of the LAT protocol. The display includes the Ethernet address of node RWWUP. Because incoming connections are enabled, you can connect to a service on node RWWUP, provided that your node belongs to one of the service groups listed in the display.

Node RWWUP offers two services: NAC and SYSMGR. Both are available.

```
3    LATCP>  SHOW NODE/ALL/BRIEF
```

The SHOW NODE command in this example produces the following display about all nodes known to the local node:

```
Node Name            Status       Identification
-----------------    -----------  ---------------------------------------------
ABLAN                Reachable     Unauthorized access is prohibited.
ASKWEN               Reachable     .
CHUNK                Reachable     A member of the MAIN VAXcluster
          .
          .
          .
UTOO                 On            Can be healthy at the Center
VULCUN               Reachable     Beam me up
ZENX                 Reachable     ZENX
```

The SHOW NODE command in this example indicates the status (reachability) and identification of all nodes known to the local node. Notice that the display includes the status of the local node, UTOO. The status can be either On, Off, or Shut. Here it is On.

SHOW PORT

Displays the status and LAT characteristics of ports on the local VMS node.

FORMAT

SHOW PORT *[port-name]*

PARAMETER

port-name

Specifies the name of the port for which information is displayed. If you do not specify a port name, the SHOW PORT command displays the characteristics for all LTA*n*: ports on a node.

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

QUALIFIERS

/APPLICATION

Generates a display of all application ports.

/BRIEF

This displays port type, port status, and the remote node name, port, and service associated with the port. This is the default if you do not specify a port name with the SHOW PORT command.

/DEDICATED

Generates a display of all dedicated ports.

/FORWARD

Generates a display of all LAT ports used for either outgoing LAT connections or local LAT management functions.

/FULL

This displays the following information. For more details, see the discussion for the sample display in Example ❶ given with the SHOW PORT command.

- Port type
- Port status
- Target port name, node name, and service name associated with the port
- Remote node name, port, and service associated with the port if a connection is currently active

/INTERACTIVE

Generates a display of all LAT ports used for incoming interactive connections.

LATCP
SHOW PORT

DESCRIPTION

If a port is an application 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 LATCP shows the port as "Interactive" in the display, a user on a terminal server or on a VMS node that supports outgoing LAT connections is currently using the port.

For all ports with active sessions, the remote node sends its node name and port name to your local node. These names are listed in the display.

EXAMPLE

```
LATCP>  SHOW PORT /FULL
```

The SHOW PORT command in this example produces the following type of display. The display reflects the characteristics set by the command examples given with the SET PORT command.

```
Local Port Name:   _LTA16:           Local Port Type:  Forward
Local Port State:  Inactive
Connected Link:

 Target Port Name:                      Actual Port Name:
 Target Node Name:     LATCP$MGMT_PORT  Actual Node Name:
 Target Service Name:                   Actual Service Name:

-------------------------------------------------------------------------------

Local Port Name:   _LTA17:           Local Port Type:  Interactive
Local Port State:  Active
Connected Link:    LAT$LINK

 Target Port Name:                      Actual Port Name:     PORT_1
 Target Node Name:                      Actual Node Name:     MY_DS200_SERVER
 Target Service Name:                   Actual Service Name:

-------------------------------------------------------------------------------

Local Port Name:   _LTA19:           Local Port Type:  Application (Queued)
Local Port State:  Active
Connected Link:    LAT$LINK

 Target Port Name:                      Actual Port Name:
 Target Node Name:     TLAT1            Actual Node Name:     TLAT1
 Target Service Name:  PRINTER          Actual Service Name:  PRINTER

-------------------------------------------------------------------------------

Local Port Name:   _LTA21:           Local Port Type:  Dedicated
Local Port State:  Inactive
Connected Link:

 Target Port Name:                      Actual Port Name:
 Target Node Name:                      Actual Node Name:
 Target Service Name:  GRAPHICS         Actual Service Name:

-------------------------------------------------------------------------------

Local Port Name:   _LTA22:           Local Port Type:  Application (Queued)
Local Port State:  Active
Connected Link:    LAT$LINK

 Target Port Name:     LN02             Actual Port Name:     LN02
 Target Node Name:     TS33EW           Actual Node Name:     TS33EW
 Target Service Name:                   Actual Service Name:

-------------------------------------------------------------------------------
```

The display in this example shows information about all the ports on the local node. There are four types of ports. The display shows information for each of these types.

1 Forward: a port used for outgoing LAT connections or for executing local management functions and LATCP commands. Port LTA16: is a forward port. The display shows that the port is currently inactive, that is, there is no current LAT connection. The target node name of LATCP$MGMT_PORT indicates that LATCP is using this port to execute the LATCP commands entered by the user. If the display listed a node and service name, it would mean that the port is being used for an outgoing connection.

2 Interactive: a port created as a result of an incoming LAT connection request from another node or terminal server. Port LTA17: is an interactive port connected with port PORT_1 on the terminal server MY_DS200_SERVER.

3 Application: a port used for solicited connections to devices on terminal servers or to application services on remote LAT service nodes. Port LTA22: is an application port. The port maps to port LN02 (a printer) on a terminal server node TS33EW. The display indicates that server TS33EW queues connection requests from the local node. Port LAT19: also is an application port. The port maps to the service PRINTER on terminal server TLAT1.

4 Dedicated: a port dedicated to a local application service. Port LTA21: is dedicated to the service GRAPHICS.

The target port name, target node name, and target service name are the names specified with the SET PORT command. They are passed to the remote node or terminal server when the connection request is made.

The actual port name, actual node name, and actual service name are the names returned by the remote node when it accepts the the connection request. They may differ from the corresponding target names (specified with the SET PORT command) if the remote node translates the names. For example, terminal servers that accept connections to LAT service names usually return the name of the port to which the connection was actually directed.

SHOW SERVICE

Displays the status and LAT characteristics of LAT services known to the local VMS node.

FORMAT

SHOW SERVICE *[service-name]*

PARAMETERS

service-name

Specifies the name of the service for which information will be displayed. If you do not specify a service name, LATCP displays information about all services known to the VMS node.

QUALIFIERS

/BRIEF

Displays the status and identification string of the service.

/COUNTERS

Displays the counters kept for the service. Do not use the /BRIEF or /FULL qualifiers with this qualifier. The following table lists and describes the counters:

Counter	Description
Remote Counters	
Connections Attempted	The total number of times the local node attempted to connect to the service offered on a remote node.
Connections Completed	The total number of times the local node successfully connected to the service offered on a remote node.
Local Counters	
Connections Accepted	The total number of times the local node accepted a connection request from a remote node to a locally offered service.
Connections Rejected	The total number of times the local node rejected a connection request from a remote node to a locally offered service.

/FULL

Displays the status, identification string, and type of service, and the values set for service characteristics. This qualifier also displays the status of all service nodes offering the service.

/LOCAL

Displays information about services offered by the local VMS node only. You can use this qualifier with the /BRIEF, /COUNTERS, or /FULL qualifier.

DESCRIPTION

This command displays information about services. If you do not specify a service name, the command displays information about all services known to your local node. If you do not specify a service name but specify the /LOCAL qualifier, the command displays information about all services offered by your local node.

Depending on whether you use the /BRIEF, /COUNTERS, or /FULL qualifier, you can display the status, identification string, and type of service, the status of all service nodes offering the service, the values set for service characteristics, and service counters.

EXAMPLES

1 LATCP> SHOW SERVICE HOMEWK/FULL

The SHOW SERVICE command in this example produces the following display of information about service HOMEWK. This service is offered by the local node.

```
Service Name:    HOMEWK                  Service Type:  General
Service Status:  Available
Service Ident:   .

Node Name            Status      Rating   Identification
LAV                  On            31 D   .
LATP                 Reachable     48     .
LITTN                Reachable     37     .
LTDRV                Reachable     82     .
```

The display in this example indicates that the locally offered service HOMEWK is available and its service type is General, meaning that it is a general timesharing service (in contrast to a dedicated application service). The display also lists the status of all the nodes that offer the service. The local node is LAV. The status of the local node can be either On, Off, or Shut. Here node LAV's status is On. The status of the other nodes indicates whether they are reachable. The display lists the ratings of each service node, indicating their relative capacity to accept new connections. The "D" next to the locally offered service indicates that node LAV computes its rating dynamically. An "S" would indicate that the node's rating was set permanently by the node's system manager.

2 LATCP> SHOW SERVICE OFFICE/FULL

The SHOW SERVICE command in this example produces the following display of information about the service OFFICE, which is offered by a remote node:

```
Service Name:    OFFICE
Service Status:  Available
Service Ident:   .

Node Name            Status      Rating   Identification
BURGIL               Reachable    121     .
DARWIN               Reachable     43     .
```

The display in this example indicates that the service is available. The display indicates the status and other information about the nodes that offer the service, nodes BURGIL and DARWIN.

SPAWN

Creates a subprocess, enabling you to execute DCL commands without terminating your LATCP session. The LATCP SPAWN command is similar to the DCL SPAWN command.

To return to your LATCP session, either logout of the subprocess by entering the DCL LOGOUT command, or use the DCL ATTACH command to attach your terminal to the process running LATCP.

FORMAT

SPAWN *[DCL-command]*

PARAMETER

DCL-command

Specifies a DCL command. If you specify a DCL command, LATCP executes the command in a subprocess. Control returns to LATCP when the DCL command terminates.

If you do not specify a DCL command, LATCP creates a subprocess and you can then enter DCL commands. You can continue your LATCP session by logging out of the spawned subprocess or by attaching to the parent process with the DCL ATTACH command.

DESCRIPTION

The SPAWN command acts exactly like the DCL SPAWN command. You can enter DCL commands (such as to create print queues, change the protection of a device, answer mail, and so forth) without ending your LATCP session.

You can not use this command to gain access to DCL if you are running LATCP from a captive account.

EXAMPLE

```
LATCP>  SPAWN
$
```

The SPAWN command in this example creates a subprocess at DCL level. You can now enter DCL commands. Log out or enter the DCL ATTACH command to return to the LATCP prompt.

ZERO COUNTERS

Resets the link, node, and service counters maintained by the local VMS node. You must have OPER privilege to use this command.

FORMAT ZERO COUNTERS

COMMAND QUALIFIERS

/LOG
/NOLOG

Specifies whether LATCP displays a message confirming that the counters were reset. The default is /NOLOG.

/LINK[=link-name]

Specifies the link (on your local node) for which you want counters reset. If you do not specify a link name, LATCP zeros counters for the link LAT$LINK.

/NODE[=node-name]

Specifies the node for which you want counters reset. If you do not specify a node name, LATCP zeros the counters for your local node.

/SERVICE=service-name

Specifies the service (on your local node) for which you want counters reset.

DESCRIPTION

This command resets counters. You can specify whether you want to reset link, node, or service counters. You must specify either /LINK, /NODE, or /SERVICE.

EXAMPLE

```
LATCP>  ZERO COUNTERS/SERVICE=LTVM
LATCP>  SHOW SERVICE LTVM /COUNTERS


     Service Name:  LTVM

     Seconds Since Zeroed:          9
     Connections Attempted:         0    Connections Accepted:          0
     Connections Completed:         0    Connections Rejected:          0
```

The ZERO COUNTERS command in this example resets the counters kept for service LTVM. The display produced by the SHOW SERVICE command shows how the ZERO counters command reset the counters to zero.

A Sample LAT$SYSTARTUP.COM Command Procedures

LAT$SYSTARTUP.COM contains LATCP commands that define your VMS system's LAT characteristics. Section A.2 shows the LAT$SYSTARTUP.COM procedure supplied by Digital.

Edit LAT$SYSTARTUP.COM to define LAT characteristics special for your node. The characteristics take effect the next time the command procedure is invoked. Section A.3 includes a sample edited LAT$SYSTARTUP.COM.

A.1 Invoking LAT$SYSTARTUP.COM

Invoke LAT$SYSTARTUP.COM by executing the following command to invoke the LAT$STARTUP command procedure:

```
$ @SYS$STARTUP:LAT$STARTUP
```

LAT$STARTUP first invokes LAT$CONFIG.COM, and then invokes LAT$SYSTARTUP.COM. LAT$STARTUP.COM and LAT$CONFIG.COM are located in the SYS$STARTUP directory. LAT$SYSTARTUP.COM is located in the SYS$MANAGER directory.

To make sure the LAT software is started every time you reboot your system, add the command to STARTUP_Vx.COM.

Note: Digital recommends that you invoke LAT$STARTUP.COM to invoke LAT$SYSTARTUP. Do not invoke LAT$SYSTARTUP directly. LAT$CONFIG must be invoked before LAT$SYSTARTUP to load the LAT driver and start LATACP.

When the command to invoke LAT$STARTUP.COM is executed, your local VMS system will be set up as a LAT service node that supports only interactive terminals. A service is created with the same name and identification that are used by the service node. You can specify a unique service name and identification and several other node and service characteristics by appending any of the following arguments to the @SYS$STARTUP:LAT$STARTUP command:

```
$ @SYS$STARTUP:LAT$STARTUP "P1" "P2" "P3" "P4" "P5"
```

The arguments P1 through P5 have the following meaning:

Sample LAT$SYSTARTUP.COM Command Procedures

A.1 Invoking LAT$SYSTARTUP.COM

Format	Meaning
	P1 Argument
Service-name	Name of the VMS service. For clustered VMS service nodes, use the cluster alias as the service name. For independent VMS service nodes, use the DECnet node name. SYS$STARTUP:LAT$SYSTARTUP.COM uses the argument P1 to assign a service name to the node (with the LATCP CREATE SERVICE command).
	P2 through P4 Arguments[1]
/IDENTIFICATION="string"	Description of the node and its services that is advertised over the Ethernet. The default is the string defined by the logical name SYS$ANNOUNCE. Make sure you include two sets of quotes around the identification string as in the following example: /IDENTIFICATION=""Official system center""
/GROUPS=(ENABLE=group-list)	Terminal server groups qualified to establish connections with the VMS service node. By default, Group 0 is enabled.
/GROUPS=(DISABLE=group-list)	Removes previously enabled terminal server groups. If you are specifying the preceding qualifier to enable groups, you can combine the qualifiers into one, as shown in the example that follows this table.
	P5 Argument[2]
Any qualifiers valid with the CREATE SERVICE command.	SYS$STARTUP:LAT$SYSTARTUP.COM uses this argument to assign service characteristics with the LATCP CREATE SERVICE command. You can specify the /IDENTIFICATION, /LOG, and /STATIC_RATING qualifiers. Specify several qualifiers as shown in the following example: "/IDENTIFICATION=""Official system node"" /STATIC_RATING=250".

[1] Any of these qualifiers can be specified. SYS$STARTUP:LAT$SYSTARTUP.COM uses the arguments to assign LAT node characteristics (with the LATCP SET NODE command).

[2] P5 is used only if P1 is specified.

For example, the following command creates the service OFFICE on the VMS service node, MOE:

```
$  @SYS$STARTUP:LAT$STARTUP OFFICE -
_$  /GROUPS=(ENABLE=(1,4-9),DISABLE=0)
```

If you want to use remote printers on a terminal server or to create dedicated application services on your VMS node, you must edit LAT$SYSTARTUP.COM.

Note: Digital advises that you do not edit LAT$CONFIG.COM or LAT$STARTUP.COM. Edit LAT$SYSTARTUP.COM only.

A.2 LAT$SYSTARTUP.COM As Supplied by Digital

Example A–1 shows the LAT$SYSTARTUP.COM that Digital supplies with your VMS software.

Example A–1 The LAT$SYSTARTUP.COM Supplied by Digital

```
$! Copyright (c) 1990 Digital Equipment Corporation.  All rights reserved.
$!
$!    LAT$SYSTARTUP.COM -- LAT Startup Commands Specific to Site
$!
❶
$!    Use this command procedure to customize the LAT characteristics for
$!    the local node.  These commands, which should serve as examples,
$!    will set up a LAT service name SYS$NODE and default identification
$!    SYS$ANNOUNCE.  The LAT service name and identification will default
$!    to SYS$NODE and SYS$ANNOUNCE unless you specify a service name and
$!    identification as arguments to the command line that invokes
$!    LAT$STARTUP.COM:
$!                    $ @SYS$STARTUP:LAT$STARTUP
$!
$!    You can specify other node and service characteristics (such as group
$!    codes) as arguments to this command line, as shown below.
$!
$!        Argument     Function
$!        ---------    --------
$!
$!           P1        Name of the service to be created.  If not supplied, a
$!                     service will be created with the same name as the node.
$!
$!        P2,P3,P4     Parameters and qualifiers to the SET NODE command.
$!
$!           P5        Parameters and qualifiers to the SET SERVICE command.
$!                     P5 is only used if P1 is specified.  More than one
$!                     argument may be supplied by enclosing the string in
$!                     quotes.
$!
$!    Example: $ @SYS$STARTUP:LAT$STARTUP HAWK "/IDENTIFICATION=" -
$!                      """""Development node"""""
$!
$!    Please review and edit this file for possible additions and deletions
$!    that you wish to make.  Future software updates will not overwrite the
$!    changes made to this file.
$!
$ required_privileges = "OPER"
$ prev_privs = f$setprv(required_privileges)
$ if .not. f$privilege(required_privileges) then goto no_privileges
$ lcp := $latcp
$!
$! ---------------------  Modify Node Characteristics  ------------------------
$!
❷ $ lcp set node 'p2' 'p3' 'p4'
$!
$! Enable LAT server mode and user groups.
```

(continued on next page)

Example A–1 (Cont.) The LAT$SYSTARTUP.COM Supplied by Digital

```
$!
❸ $! lcp set node /connections=both /user_groups=(enable=(24,121-127),disable=0)
❹ $! lcp set node /connections=both /user_groups=(enable=0-255) /node_limit=50
$!
$! Allow incoming connections only
$!
❺ $! lcp set node /connections=incoming_only /groups=enable=(0-255)
$!
$! --------------------  Modify Service Characteristics  ----------------------
$!
❻ $ if p1 .eqs. ""
$ then
$    lcp create service
$ else
❼ $     lcp create service 'p1' 'p5'
$ endif
$! -------------------------  Start LAT Protocol  -----------------------------
$!
❽ $ lcp set node /state=on
$!
$! -------------------------  Create and Map Ports  ---------------------------
$!
❾ $! lcp create port lta101: /dedicated
❿ $! lcp create port lta102: /application
$! lcp create port lta103: /application
⓫ $! lcp create port /nolog/logical=(name=ln03$mgmt, table=system, mode=executive)
$!
⓬ $! lcp set port lta101: /dedicated /service=graphics
⓭ $! lcp set port lta102: /node=server_1 /port=port_1
⓮ $! lcp set port lta103: /node=server_2 /service=laser
$! lcp set port ln03$mgmt: /node=server_3 /service=ln03_printers
$!
$exit:
$ prev_privs = f$setprv(prev_privs)
$ exit
$!
$no_privileges:
$ write sys$output "Insufficient privileges to execute LATCP commands."
$ write sys$output "Requires ",required_privileges," privileges."
$ goto exit
```

The following list explains specific sections and command lines called out in the procedure.

❶ Callout ❶ explains examples of commands used for setting up a LAT service.

❷ Sets up the LAT node name for your VMS system. The optional arguments P2, P3, and P4 are the unique identification string, enabled groups, and disabled groups that you can specify with the command line that invokes LAT$STARTUP.COM as explained in Section A.1.

❸ **Of this command, and the two that follow, only one should be used.** Remove the exclamation mark (!) that precedes the command you want LAT$SYSTARTUP.COM. to process.

This SET NODE command sets up your VMS node as a service node accepting incoming connections and allowing outgoing connections. The command also specifies that users on your VMS node can access service nodes that belong to user groups 24 and 121 through 127. Users cannot access service nodes that belong to user group 0.

❹ This SET NODE command sets up your VMS node as a service node accepting incoming connections and allowing outgoing connections. The command also specifies that users on your VMS node can access service nodes that belong to all user groups. It also specifies that the service node database should have a limit of 50 nodes.

❺ This SET NODE command sets up your VMS node as a service node accepting incoming connections only. The command also specifies that all groups have access to services offered on your VMS node.

❻ If you do not specify a service name in the command line that invokes LAT$STARTUP.COM, LAT$SYSTARTUP.COM creates a service that takes on the name and identification of your VMS node.

❼ If you did specify a service name in the command line, LAT$SYSTARTUP.COM creates a service that takes on the specified name (argument P1) and any other service characteristics you specify (argument P5).

❽ This command starts the LAT port driver on your VMS node. This allows new LAT connections to be created on the node.

❾ **This and the next seven commands do not get processed by LAT$SYSTARTUP.COM unless you remove the preceding exclamation marks (!).** This command creates a dedicated logical port, LTA101:.

❿ This and the next command create two application ports: LTA102: and LTA103:.

⓫ This command creates an application port, and associates its name with the logical name "LN03$MGMT". The logical name is created as an executive mode logical in the LNM$SYSTEM_TABLE table.

⓬ This command specifies that the dedicated port LTA101: offers the service GRAPHICS to users of terminal servers or users on VMS nodes that support outgoing connections.

⓭ This command associates application port LTA102: with the port named PORT_1 on terminal server SERVER_1.

⓮ This command associates application port LTA103: with the service named LASER on terminal server SERVER_2. The service LASER is associated with several printer ports on SERVER_2.

A.3 A Sample Edited Version of LAT$SYSTARTUP.COM

The edited command procedure shown in Example A–2 sets up new LAT port and service characteristics for the VMS node. The edits reflect the changes made with several LATCP CREATE and SET command examples shown in the command reference section of this book. The changes that were made by those LATCP CREATE and SET commands stay in effect until the next time the LAT port driver is started. By editing LAT$SYSTARTUP.COM as shown in Example A–2, the changes you make with the CREATE and SET commands take effect whenever LAT$STARTUP.COM is invoked.

A.3 A Sample Edited Version of LAT$SYSTARTUP.COM

Example A–2 An Edited LAT$SYSTARTUP.COM

```
$! Copyright (c) 1990 Digital Equipment Corporation.  All rights reserved.
$!
$!    LAT$SYSTARTUP.COM -- LAT Startup Commands Specific to Site
$!
$!    Use this command procedure to customize the LAT characteristics for
$!    the local node.  These commands, which should serve as examples,
$!    will set up a LAT service name SYS$NODE and default identification
$!    SYS$ANNOUNCE.  The LAT service name and identification will default
$!    to SYS$NODE and SYS$ANNOUNCE unless you specify a service name and
$!    identification as arguments to the command line that invokes
$!    LAT$STARTUP.COM:
$!                    $ @SYS$STARTUP:LAT$STARTUP
$!
$!    You can specify other node and service characteristics (such as group
$!    codes) as arguments to this command line, as shown below.
$!
$!        Argument     Function
$!        ---------    --------
$!
$!           P1        Name of the service to be created.  If not supplied, a
$!                     service will be created with the same name as the node.
$!
$!        P2,P3,P4     Parameters and qualifiers to the SET NODE command.
$!
$!           P5        Parameters and qualifiers to the SET SERVICE command.
$!                     P5 is only used if P1 is specified.  More than one
$!                     argument may be supplied by enclosing the string in
$!                     quotes.
$!
$!    Example: $ @SYS$STARTUP:LAT$STARTUP HAWK "/IDENTIFICATION=" -
$!                      """""Development node"""""
$!
$!    Please review and edit this file for possible additions and deletions
$!    that you wish to make.  Future software updates will not overwrite the
$!    changes made to this file.
$!
$ required_privileges = "OPER"
$ prev_privs = f$setprv(required_privileges)
$ if .not. f$privilege(required_privileges) then goto no_privileges
$ lcp := $latcp
$!
$! ----------------------  Modify Node Characteristics  ------------------------
$!
$ lcp set node 'p2' 'p3' 'p4'
$!
$! Enable LAT server mode and user groups.
$!
❶ $ lcp set node /connections=both /user_groups=(enable=(1-3,7,10-20),disable=0)
$!
$! ---------------------  Modify Service Characteristics  ----------------------
$!
$ if p1 .eqs. ""
$ then
$    lcp create service
$ else
$     lcp create service 'p1' 'p5'
$ endif
$!
$! -------------------------  Start LAT Protocol  -----------------------------
$!
❷ $ lcp set node /state=on
$!
$! -------------------------  Create and Map Ports  ----------------------------
$!
❸
$ lcp create service /application graphics
$ lcp create port lta21: /dedicated
$ lcp set port lta21: /service=graphics
$!
❹ $ lcp create port lta22: /application
$ lcp set port lta22: /node=ts33ew /port=ln02
```

(continued on next page)

Example A–2 (Cont.) An Edited LAT$SYSTARTUP.COM

```
$!
❺ $ lcp create port lta19: /application
$ lcp set port lta19: /node=tlat1 /service=printer
$!
$exit:
$ prev_privs = f$setprv(prev_privs)
$ exit
$!
$no_privileges:
$ write sys$output "Insufficient privileges to execute LATCP commands."
$ write sys$output "Requires ",required_privileges," privileges."
$ goto exit
```

The following list explains several of the edited command lines in the procedure.

❶ This command was edited to enable users on the local node to access service nodes belonging to user groups 1 through 3, 7, and 10 through 20.

❷ This command starts the LAT port driver on your VMS node, allowing new LAT connections to be created on the node. The LAT characteristics set in the preceding commands will take effect.

❸ These commands create an application service (GRAPHICS) on the local node and a port (LTA21:) that is dedicated to the service. Remote nodes that connect to the service GRAPHICS will get connected to this port. The application program should assign a channel to this port and prepare to receive and transmit data to the remote node through the device associated with LTA21:.

❹ The CREATE PORT command creates an application device that will support remote printer access. The SET PORT command maps the device to a specific printer port on terminal server TS33EW.

❺ The CREATE PORT command creates another application device that will support remote printer access. The SET PORT command maps the device to a service (PRINTER) that is associated with several ports on terminal server TLAT1.

B LATCP Command Summary

Use this appendix as a quick reference for LATCP commands and their qualifiers.

B.1 Invoking and Exiting LATCP

Enter the following command to invoke LATCP:

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

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

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

```
$  LATCP :== $LATCP
$  LATCP SET NODE/STATE=ON
```

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

B.2 LATCP Command Summary

Table B–1 lists the LATCP commands and qualifiers.

Table B–1 LATCP Commands and Qualifiers

Command	Qualifiers	Qualifier Options
ATTACH [process-name]	/PID=pid	
CREATE LINK link-name	/[NO]DECNET	
	/DEVICE=device-name	
	/[NO]LOG	
	/STATE=option	ON
		OFF
CREATE PORT [port-name]	/APPLICATION	
	/DEDICATED	
	/[NO]LOG	
	/LOGICAL=(NAME=logical-name[,TABLE=table][,MODE=mode)	
CREATE SERVICE [service-name]	/APPLICATION	

(continued on next page)

Table B–1 (Cont.) LATCP Commands and Qualifiers

Command	Qualifiers	Qualifier Options
	/IDENTIFICATION[="id-string"]	
	/[NO]LOG	
	/[NO]STATIC_RATING=rating	
DEFINE/KEY key-name eq-string	/[NO]ECHO	
	/IF_STATE=state-name	
	/[NO]LOCK_STATE	
	/[NO]LOG	
	/SET_STATE=state-name	
	/[NO]TERMINATE	
DELETE LINK link-name	/[NO]LOG	
DELETE PORT port-name	/[NO]LOG	
DELETE SERVICE service-name	/[NO]LOG	
EXIT		
HELP [command-name]		
RECALL [command-specifier]	/ALL	
REFRESH		
SET LINK link-name	/[NO]LOG	
	/STATE=option	ON
		OFF
SET NODE [node-name]	/CIRCUIT_TIMER=msecs	
	/CONNECTIONS=option	INCOMING_ONLY
		OUTGOING_ONLY
		BOTH
		NONE
	/[NO]CPU_RATING=cpu-power	
	/DEVICE_SEED[=value]	
	/GROUPS=option	ENABLE=group-codes
		DISABLE=group-codes
		ENABLE=group-codes,DISABLE=group-codes
	/IDENTIFICATION[="id-string"]	
	/KEEPALIVE_TIMER=secs	
	[NO]LOG	
	/MULTICAST_TIMER=secs	
	/[NO]NODE_LIMIT=value	
	/RETRANSMIT_LIMIT=count	

(continued on next page)

Table B–1 (Cont.) LATCP Commands and Qualifiers

Command	Qualifiers	Qualifier Options
	/[NO]SERVICE_RESPONDER	
	SESSION_LIMIT=option	INCOMING=value
		OUTGOING=value
		INCOMING=value,OUTGOING=value
	/STATE=option	ON
		OFF
		SHUT
	/UNIT_NUMBER_MAXIMUM=value	
	/USER_GROUPS=option	ENABLE=group-codes
		DISABLE=group-codes
		ENABLE=group-codes,DISABLE=group-codes
SET PORT port-name	/APPLICATION	
	/DEDICATED	
	/[NO]LOG	
	/NODE=remote-node-name	
	/PORT=remote-port-name	
	/[NO]QUEUED	
	/SERVICE=service-name	
SET SERVICE [service-name]	/APPLICATION	
	/IDENTIFICATION[="id-string"]	
	[NO]LOG	
	/[NO]STATIC_RATING=rating	
SHOW LINK [link-name]	/BRIEF	
	/COUNTERS[1]	
	/FULL	
SHOW NODE [node-name]	/ALL	
	/BRIEF	
	/COUNTERS[1]	
	/FULL	
SHOW PORT [port-name]	/APPLICATION	
	/BRIEF	
	/DEDICATED	
	/FORWARD	

[1]Do not use the /BRIEF or /FULL qualifiers with this qualifier.

(continued on next page)

Table B–1 (Cont.) LATCP Commands and Qualifiers

Command	Qualifiers	Qualifier Options
	/FULL	
	/INTERACTIVE	
SHOW SERVICE [service-name][2]	/BRIEF	
	/COUNTERS[1]	
	/FULL	
	/LOCAL	
SPAWN [DCL-command]		
ZERO COUNTERS[3]	/[NO]LOG	
	/LINK=[link-name]	
	/NODE[=node-name]	
	/SERVICE=service-name	

[1]Do not use the /BRIEF or /FULL qualifiers with this qualifier.

[2]If you do not specify a service name, the command displays information about all services known to your local node. If you do not specify a service name but specify the /LOCAL qualifier, the command displays information about all services offered by your local node.

[3]You must specify either /LINK, /NODE, or /SERVICE.

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