



DES-6500

Modular Layer 3 Switch

Command Line Interface Reference Manual

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INTRODUCTION

The switch can be managed through the switch's serial port, Telnet, or the Web-based management agent. The Command Line Interface (CLI) can be used to configure and manage the switch via the serial port or Telnet interfaces.

This manual provides a reference for all of the commands contained in the CLI. Configuration and management of the switch via the Web-based management agent is discussed in the User's Guide.

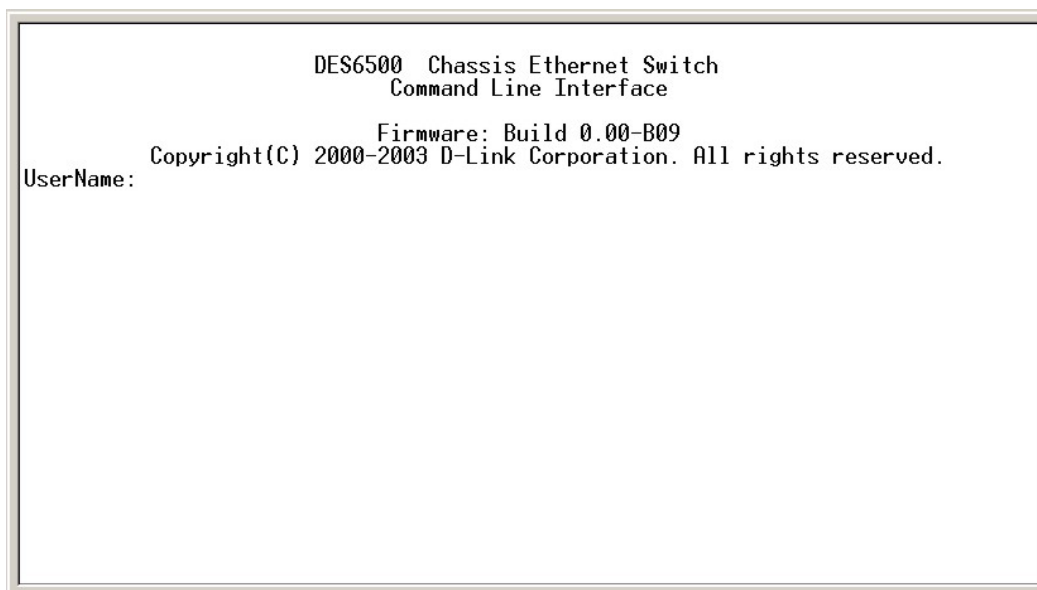
Accessing the Switch via the Serial Port

The switch's serial port's default settings are as follows:

- **115200 baud**
- **no parity**
- **8 data bits**
- **1 stop bit**
- **Flow control – None**

A computer running a terminal emulation program capable of emulating a VT-100 terminal and a serial port configured as above is then connected to the switch's serial port via an RS-232 DB-9 cable.

With the serial port properly connected to a management computer, the following screen should be visible. If this screen does not appear, try pressing Ctrl+r to refresh the console screen.



```
DES6500 Chassis Ethernet Switch
Command Line Interface

Firmware: Build 0.00-B09
Copyright(C) 2000-2003 D-Link Corporation. All rights reserved.
UserName:
```

Figure 1-1. Initial CLI screen

There is no initial username or password. Just press the **Enter** key twice to display the CLI input cursor – **DES-6500:4#**. This is the command line where all commands are input.

Setting the Switch's IP Address

Each Switch must be assigned its own IP Address, which is used for communication with an SNMP network manager or other TCP/IP application (for example BOOTP, TFTP). The switch's default IP address is 10.90.90.90. You can change the default Switch IP address to meet the specification of your networking address scheme.

The switch is also assigned a unique MAC address by the factory. This MAC address cannot be changed, and can be found on the initial boot console screen – shown below.

```

Boot Procedure 0.00-B12
-----
Power On Self Test ..... 100 %
MAC Address   : 00-01-02-03-04-00

Please wait, loading Runtime image ..... 100 %
UART init ..... 100 %
Firmware Version: 0.00-B09
DES6500 CPU Card: BoxType=DES6502
Device Discovery ..... 100 %
Configuration init ..... |_

```

Figure 1-2. Boot Screen

The switch's MAC address can also be found in the Web management program on the Switch Information (Basic Settings) window on the Configuration menu.

The IP address for the switch must be set before it can be managed with the Web-based manager. The switch IP address can be automatically set using BOOTP or DHCP protocols, in which case the actual address assigned to the switch must be known.

The IP address may be set using the Command Line Interface (CLI) over the console serial port as follows:

1. Starting at the command line prompt, enter the commands **config ipif System ipaddress xxx.xxx.xxx.xxx/yyy.yyy.yyy.yyy**. Where the **x**'s represent the IP address to be assigned to the IP interface named **System** and the **y**'s represent the corresponding subnet mask.
2. Alternatively, you can enter **config ipif System ipaddress xxx.xxx.xxx.xxx/z**. Where the **x**'s represent the IP address to be assigned to the IP interface named **System** and the **z** represents the corresponding number of subnets in CIDR notation.

The IP interface named **System** on the switch can be assigned an IP address and subnet mask which can then be used to connect a management station to the switch's Telnet or Web-based management agent.

```

DES6500 Chassis Ethernet Switch
Command Line Interface

Firmware: Build 0.00-B09
Copyright(C) 2000-2003 D-Link Corporation. All rights reserved.
UserName:
Password:

DES6500:4#config ipif System ipaddress 10.42.73.102/255.0.0.0
Command: config ipif System ipaddress 10.42.73.102/8

Success.

DES6500:4#

```

Figure 1-3. Assigning an IP Address

In the above example, the switch was assigned an IP address of 10.42.73.102 with a subnet mask of 255.0.0.0. The system message **Success** indicates that the command was executed successfully. The switch can now be configured and managed via Telnet and the CLI or via the Web-based management agent using the above IP address to connect to the switch.

USING THE CONSOLE CLI

The DES-6500 supports a console management interface that allows the user to connect to the switch's management agent via a serial port and a terminal or a computer running a terminal emulation program. The console can also be used over the network using the TCP/IP Telnet protocol. The console program can be used to configure the switch to use an SNMP-based network management software over the network.

This chapter describes how to use the console interface to access the switch, change its settings, and monitor its operation.



Note: Switch configuration settings are saved to non-volatile RAM using the `save` command. The current configuration will then be retained in the switch's NV-RAM, and reloaded when the switch is rebooted. If the switch is rebooted without using the `save` command, the last configuration saved to NV-RAM will be loaded.

Connecting to the Switch

The console interface is used by connecting the Switch to a VT100-compatible terminal or a computer running an ordinary terminal emulator program (e.g., the **HyperTerminal** program included with the Windows operating system) using an RS-232C serial cable. Your terminal parameters will need to be set to:

- **VT-100 compatible**
- **115200 baud**
- **8 data bits**
- **No parity**
- **One stop bit**
- **No flow control**

You can also access the same functions over a Telnet interface. Once you have set an IP address for your Switch, you can use a Telnet program (in VT-100 compatible terminal mode) to access and control the Switch. All of the screens are identical, whether accessed from the console port or from a Telnet interface.

After the switch reboots and you have logged in, the console looks like this:

```
DES6500 Chassis Ethernet Switch
Command Line Interface

Firmware: Build 0.00-B09
Copyright(C) 2000-2003 D-Link Corporation. All rights reserved.
UserName:
```

Figure 2-1. Initial Console Screen

Commands are entered at the command prompt, **DES-6500:4#**.

There are a number of helpful features included in the CLI. Entering the **?** command will display a list of all of the top-level commands.

```
DES-6500:4# ?
clear
clear arptable
clear counters
clear fdb
clear log
config 802.1p default_priority
config 802.1p user_priority
config 802.1x auth_parameter ports
config 802.1x auth_protocol
config 802.1x capability ports
config 802.1x init
config 802.1x reauth
config access_profile profile_id
config account
config all_boxes_id
config arp_aging time
config bandwidth_control
config bootp_relay
config bootp_relay add ipif
config bootp_relay delete ipif
CTRL-C ESC q Quit SPACE n Next Page ENTER Next Entry a All
```

Figure 2-2. The ? Command

When you enter a command without its required parameters, the CLI will prompt you with a **Next possible completions:** message.

```
DES6500:4#config account
Command: config account
Next possible completions:
  <username>

DES6500:4#
```

Figure 2-3. Example Command Parameter Help

In this case, the command **config account** was entered with the parameter **<username>**. The CLI will then prompt you to enter the **<username>** with the message, **Next possible completions:**. Every command in the CLI has this feature, and complex commands have several layers of parameter prompting.

In addition, after typing any given command plus one space, you can see all of the next possible sub-commands, in sequential order, by repeatedly pressing the **Tab** key.

To re-enter the previous command at the command prompt, press the up arrow cursor key. The previous command will appear at the command prompt.


```
DES6500:4#config account
Command: config account
Next possible completions:
    <username>

DES6500:4#config account
```

Figure 2-4. Using the Up Arrow to Re-enter a Command

In the above example, the command **config account** was entered without the required parameter **<username>**, the CLI returned the **Next possible completions: <username>** prompt. The up arrow cursor control key was pressed to re-enter the previous command (**config account**) at the command prompt. Now the appropriate User name can be entered and the **config account** command re-executed.

All commands in the CLI function in this way. In addition, the syntax of the help prompts are the same as presented in this manual – angle brackets **<>** indicate a numerical value or character string, braces **{ }** indicate optional parameters or a choice of parameters, and brackets **[]** indicate required parameters.

If a command is entered that is unrecognized by the CLI, the top-level commands will be displayed under the **Available commands:** prompt.

```
DES6500:4#;ld
Available commands:
  .. ? clear config create delete disable download enable login logout
  ping reboot reset save show traceroute upload

DES6500:4#
```

Figure 2-5. The Next Available Commands Prompt

The top-level commands consist of commands such as **show** or **config**. Most of these commands require one or more parameters to narrow the top-level command. This is equivalent to **show what?** or **config what?** Where the **what?** is the next parameter.

For example, if you enter the **show** command with no additional parameters, the CLI will then display all of the possible next parameters.

```
DES6500:4#show
Command: show
Next possible completions:
 802.1p 802.1x access_profile account acct_client arpentry auth_client
auth_diagnostics auth_session_statistics auth_statistics
bandwidth_control bootp_relay command_history device_status dnsr dvmp
error fdb gvrp hol_prevention igmp igmp_snooping ipfdb ipif ipmc
iproute jumbo_frame lacp_port link_aggregation log md5 mirror
multicast_fdb ospf packet pim port_security ports radius rip route
router_ports scheduling scheduling_mechanism serial_port session snmp
snmp stack_information stp switch switch_mode syslog time traffic
traffic_segmentation trusted_host utilization vlan

DES6500:4#
```

Figure 2-6. Next possible completions: Show Command

In the above example, all of the possible next parameters for the **show** command are displayed. At the next command prompt, the up arrow was used to re-enter the **show** command, followed by the **account** parameter. The CLI then displays the user accounts configured on the switch.

COMMAND SYNTAX

The following symbols are used to describe how command entries are made and values and arguments are specified in this manual. The online help contained in the CLI and available through the console interface uses the same syntax.



Note: All commands are case-sensitive. Be sure to disable Caps Lock or any other unwanted function that changes case of entered text.

<angle brackets>	
Purpose	Encloses a variable or value that must be specified.
Syntax	create ipif <ipif_name 12> <network_address> <vlan_name 32> {state [enabled disabled]}
Description	In the above syntax example, you must supply an IP interface name in the <ipif_name 12> space, a VLAN name in the <vlan_name 32> space, and the network address in the <network_address> space. Do not type the angle brackets.
Example Command	create ipif Engineering vlan Design ipaddress 10.24.22.5/255.0.0.0

[square brackets]	
Purpose	Encloses a required value or set of required arguments. One value or argument can be specified.
Syntax	create account [admin user] <username 15>
Description	In the above syntax example, you must specify either an admin or a user level account to be created. Do not type the square brackets.
Example Command	create account admin 222

vertical bar	
Purpose	Separates two or more mutually exclusive items in a list, one of which must be entered.
Syntax	Reset {[config system]}
Description	In the above syntax example, you must specify either config , or system . Do not type the backslash.
Example Command	Reset config

{braces}	
Purpose	Encloses an optional value or set of optional arguments.
Syntax	reset {[config system]}
Description	In the above syntax example, you have the option to specify config or detail . It is not necessary to specify either optional value, however the effect of the system reset is dependent on which, if any, value is specified. Therefore, with this example there are three possible outcomes of performing a system reset. See the following chapter.

{braces}	
	Basic Commands for more details about the reset command.
Example command	reset config

Line Editing Key Usage	
Delete	Deletes the character under the cursor and then shifts the remaining characters in the line to the left.
Backspace	Deletes the character to the left of the cursor and shifts the remaining characters in the line to the left.
Left Arrow	Moves the cursor to the left.
Right Arrow	Moves the cursor to the right.
Up Arrow	Repeat the previously entered command. Each time the up arrow is pressed, the command previous to that displayed appears. This way it is possible to review the command history for the current session. Use the down arrow to progress sequentially forward through the command history list.
Down Arrow	The down arrow will display the next command in the command history entered in the current session. This displays each command sequentially as it was entered. Use the up arrow to review previous commands.
Tab	Shifts the cursor to the next field to the left.

Multiple Page Display Control Keys	
Space	Displays the next page.
CTRL+c	Stops the display of remaining pages when multiple pages are to be displayed.
ESC	Stops the display of remaining pages when multiple pages are to be displayed.
n	Displays the next page.
p	Displays the previous page.
q	Stops the display of remaining pages when multiple pages are to be displayed.
r	Refreshes the pages currently displayed.
a	Displays the remaining pages without pausing between pages.
Enter	Displays the next line or table entry.

BASIC SWITCH COMMANDS

The basic switch commands in the Command Line Interface (CLI) are listed (along with the appropriate parameters) in the following table.

Command	Parameters
create account	[admin user] <username 15>
config account	<username>
show account	
delete account	<username>
show session	
show switch	
Show stack_information	
show device_status	
show serial_port	
config serial_port	auto_logout [never 2_minutes 5_minutes 10_minutes 15_minutes]
enable clipaging	
disable clipaging	
enable telnet	<tcp_port_number 1-65535>
disable telnet	
enable web	<tcp_port_number 1-65535>
disable web	
save	
reboot	
reset	{[config system]}
login	
logout	

Each command is listed, in detail, in the following sections.

create account

Purpose	Used to create user accounts
Syntax	create account [admin user] <username 15>
Description	The create account command is used to create user accounts that consist of a username of 1 to 15 characters and a password of 0 to 15 characters. Up to 8 user accounts can be created.
Parameters	Admin <username> User <username>
Restrictions	Only Administrator-level users can issue this command. Usernames can be between 1 and 15 characters. Passwords can be between 0 and 15 characters.

Example usage:

```
DES-6500:4#create account admin dlink
Command: create account admin dlink

Enter a case-sensitive new password:****
Enter the new password again for confirmation:****
Success.

DES-6500:4#
```

To create an administrator-level user account with the username “dlink”.

config account

Purpose	Used to configure user accounts
Syntax	config account <username>
Description	The config account command configures a user account that has been created using the create account command.
Parameters	<username>
Restrictions	Only Administrator-level users can issue this command. Usernames can be between 1 and 15 characters. Passwords can be between 0 and 15 characters.

Example usage:

```
DES-6500:4#config account dlink
Command: config account dlink

Enter a old password:****
Enter a case-sensitive new password:****
Enter the new password again for confirmation:****
Success.

DES-6500:4#
```

To configure the user password of “dlink” account:

show account

Purpose	Used to display user accounts
Syntax	show account
Description	Displays all user accounts created on the switch. Up to 8 user accounts can exist on the switch at one time.
Parameters	None.
Restrictions	Only Administrator-level users can issue this command.

Example usage:

To display the accounts that have been created:

```
DES-6500:4#show account
Command: show account

Current Accounts:
Username      Access Level
-----      -
dlink        Admin
DES-6500:4#
```

delete account

Purpose	Used to delete an existing user account
Syntax	delete account <username>
Description	The delete account command deletes a user account that has been created using the create account command.
Parameters	<username>
Restrictions	Only Administrator-level users can issue this command.

Example usage:

To delete the user account "System":

```
DES-6500:4#delete account System
Command: delete account System
```

Success.

```
DES-6500:4#
```

show session

Purpose	Used to display a list of currently logged-in users.
Syntax	show session
Description	This command displays a list of all the users that are logged-in at the time the command is issued.
Parameters	None
Restrictions	Only Administrator-level users can issue this command.

Example usage:

To display the way that the users logged in:

```
DES-6500:4#show session
Command: show session

ID Live Time   From      Level  Name
--  -
*8 03:36:27  Serial Port  4   Anonymous
Total Entries: 1
```

show switch

Purpose	Used to display information about the switch.
Syntax	show switch
Description	This command displays information about the switch.
Parameters	None.
Restrictions	None.

Example usage:

To display the switch information:


```

DES-6500:4#show switch
Command: show switch
Device Type       : DES-6500 Chassis Ethernet Switch
MAC Address       : DA-10-21-00-00-01
IP Address        : 10.41.44.22 (Manual)
VLAN Name         : default
Subnet Mask       : 255.0.0.0
Default Gateway   : 0.0.0.0
Boot PROM Version : Build 0.00-B15
Firmware Version  : Build 0.00-B22
Hardware Version  : 2A1
System Name       : DES-6500_#3
System Location   : 7th_flr_east_cabinet
System Contact    : Julius_Erving_212-555-6669
Spanning Tree     : Disabled
GVRP              : Disabled
IGMP Snooping    : Disabled
RIP               : Disabled
DVMRP             : Disabled
PIM-DM           : Disabled
OSPF              : Disabled
TELNET           : Enabled (TCP 23)
WEB               : Enabled (TCP 80)
RMON              : Disabled

DES-6500:4#

```

show stack_information

Purpose	Used to display stack information about the switch.
Syntax	show stack_information
Description	This command displays stack information about the switch.
Parameters	None.
Restrictions	None.

Example usage:

To display the stack switch information:

```

DES6500:4#show stack_information
Command: show stack_information

Box          Prio- Prom   Runtime H/W
ID Type      Exist rity version version  version
-----
 1 USR-NOT-CFG no
 2 USR-NOT-CFG no
 3 USR-NOT-CFG no
 4 DES6507   exist  16 0.00-B14 0.00-B22  0A1
 5 USR-NOT-CFG no
 6 USR-NOT-CFG no
 7 DES6509   no
 8 USR-NOT-CFG no
-----
Topology    :STAR
Current state:MASTER
Box Count   :1

```

show device status

Purpose	Used to display the current status of the hardware of the switch.
Syntax	show device_status
Description	This command displays the current status of the switch's elements.
Parameters	None.
Restrictions	None

Example usage:

To show the current hardware status of the switch:

```
DES-6500:4#show device_status
```

```
Command: show device_status
```

```
RPS1 Status:
```

```
    Output voltage: Normal
```

```
    FAN1: Normal
```

```
    FAN2: Normal
```

```
RPS2 Status:
```

```
    Not Exist
```

```
System FAN1: Normal
```

```
System FAN2: Normal
```

```
System FAN3: Normal
```

```
System FAN4: Normal
```

```
DES-6500:4#
```

show serial_port

Purpose	Used to display the current serial port settings.
Syntax	show serial_port
Description	This command displays the current serial port settings.
Parameters	None.
Restrictions	None

Example usage:

To display the serial port setting:

```
DES-6500:4#show serial_port
```

```
Command: show serial_port
```

```
Baud Rate      : 115200
```

```
Data Bits      : 8
```

```
Parity Bits    : None
```

```
Stop Bits      : 1
```

```
Auto-Logout    : 10 mins
```

```
DES-6500:4#
```

config serial_port

Purpose	Used to configure the serial port.
Syntax	config serial_port {auto_logout [never 2_minutes 5_minutes 10_minutes 15_minutes]}
Description	This command is used to configure the serial port's baud rate and auto logout settings.
Parameters	<p>never – No time limit on the length of time the console can be open with no user input.</p> <p>2_minutes – The console will log out the current user if there is no user input for 2 minutes.</p> <p>5_minutes – The console will log out the current user if there is no user input for 5 minutes.</p> <p>10_minutes – The console will log out the current user if there is no user input for 10 minutes.</p> <p>15_minutes – The console will log out the current user if there is no user input for 15 minutes.</p>
Restrictions	Only administrator-level users can issue this command.

Example usage:

To configure auto logout:

```
DES-6500:4#config serial_port auto_logout never
Command: config serial_port auto_logout never

Success.

DES-6500:4#
```

enable clipaging

Purpose	Used to pause the scrolling of the console screen when the show command displays more than one page.
Syntax	enable clipaging
Description	This command is used when issuing the show command which causes the console screen to rapidly scroll through several pages. This command will cause the console to pause at the end of each page. The

enable clipaging

	default setting is enabled.
Parameters	None.
Restrictions	Only administrator-level users can issue this command.

Example usage:

To enable pausing of the screen display when the show command output reaches the end of the page:

```
DES-6500:4#enable clipaging
Command: enable clipaging

Success.

DES-6500:4#
```

disable clipaging

Purpose	Used to disable the pausing of the console screen scrolling at the end of each page when the show command displays more than one screen of information.
Syntax	disable clipaging
Description	This command is used to disable the pausing of the console screen at the end of each page when the show command would display more than one screen of information.
Parameters	None.
Restrictions	Only administrator-level users can issue this command.

Example usage:

To disable pausing of the screen display when show command output reaches the end of the page:

```
DES-6500:4#disable clipaging
Command: disable clipaging

Success.

DES-6500:4#
```

enable telnet

Purpose	Used to enable communication with and management of the switch using the Telnet protocol.
Syntax	enable telnet <tcp_port_number 1-65535>
Description	This command is used to enable the Telnet protocol on the switch. The user can specify the TCP or UDP port number the switch will use to listen for Telnet requests.
Parameters	<tcp_port_number 1-65535> – The TCP port number. TCP ports are numbered between 1 and 65535. The “well-known” TCP port for the Telnet protocol is 23.
Restrictions	Only administrator-level users can issue this command.

Example usage:

To enable Telnet and configure port number:

```
DES-6500:4#enable telnet 23
Command: enable telnet 23

Success.

DES-6500:4#
```

disable telnet

Purpose	Used to disable the Telnet protocol on the switch.
Syntax	disable telnet
Description	This command is used to disable the Telnet protocol on the switch.
Parameters	None.
Restrictions	Only administrator-level users can issue this command.

Example usage:

To disable the Telnet protocol on the switch:

DES-6500:4#disable telnet

Command: disable telnet

Success.

DES-6500:4#

enable web

Purpose	Used to enable the HTTP-based management software on the switch.
Syntax	enable web <tcp_port_number 1-65535>
Description	This command is used to enable the Web-based management software on the switch. The user can specify the TCP port number the switch will use to listen for Telnet requests.
Parameters	<tcp_port_number 1-65535> – The TCP port number. TCP ports are numbered between 1 and 65535. The “well-known” port for the Web-based management software is 80.
Restrictions	Only administrator-level users can issue this command.

Example usage:

To enable HTTP and configure port number:

DES-6500:4#enable web 80

Command: enable web 80

Success.

DES-6500:4#

disable web

Purpose	Used to disable the HTTP-based management software on the switch.
Syntax	disable web
Description	This command disables the Web-based management software on the switch.

disable web

Parameters	None.
Restrictions	Only administrator-level users can issue this command.

Example usage:

To disable HTTP:

```
DES-6500:4#disable web
Command: disable web

Success.

DES-6500:4#
```

save

Purpose	Used to save changes in the switch's configuration to non-volatile RAM.
Syntax	save
Description	This command is used to enter the current switch configuration into non-volatile RAM. The saved switch configuration will be loaded into the switch's memory each time the switch is restarted.
Parameters	None.
Restrictions	Only administrator-level users can issue this command.

Example usage:

```
DES-6500:4#save
Command: save

Saving all settings to NV-RAM... 100%
done.

DES-6500:4#
```

To save the switch's current configuration to non-volatile RAM:

reboot

Purpose	Used to restart the switch.
Syntax	reboot
Description	This command is used to restart the switch.
Parameters	None.
Restrictions	Only Administrator-level users can issue this command.

Example usage:

To restart the switch:

```
DES-6500:4#reboot
Command: reboot
Are you sure want to proceed with the system reboot? (y|n)
Please wait, the switch is rebooting...
```

reset

Purpose	Used to reset the switch to the factory default settings.
Syntax	reset {[config system]}
Description	This command is used to restore the switch's configuration to the default settings assigned from the factory.
Parameters	<p>config – If the keyword 'config' is specified, all of the factory default settings are restored on the switch including the IP address, user accounts, and the switch history log. The switch will not save or reboot.</p> <p>system – If the keyword 'system' is specified all of the factory default settings are restored on the switch. The switch will save and reboot after the settings are changed to default. Rebooting will clear all entries in the Forwarding Data Base.</p> <p>If no parameter is specified, the switch's current IP address, user accounts, and the switch history log are not changed. All other parameters are restored to the factory default settings. The switch will not save or reboot.</p>
Restrictions	Only administrator-level users can issue this command.

Example usage:

To restore all of the switch's parameters to their default values:

DES-6500:4#reset config

Command: reset config

Are you sure you want to proceed with system reset except stack information?(y/n) y

Success.

DES-6500:4#

login

Purpose	Used to log in a user to the switch's console.
Syntax	login
Description	This command is used to initiate the login procedure. The user will be prompted for his Username and Password.
Parameters	None.
Restrictions	None.

Example usage:

To initiate the login procedure:

DES-6500:4#login

Command: login

UserName:

logout

Purpose	Used to log out a user from the switch's console.
Syntax	logout
Description	This command terminates the current user's session on the switch's console.
Parameters	None.
Restrictions	None.

Example usage:

To terminate the current user's console session:

```
DES-6500:4#logout
```

SWITCH PORT COMMANDS

The switch port commands in the Command Line Interface (CLI) are listed (along with the appropriate parameters) in the following table.

Command	Parameters
config ports	<portlist all> speed [auto 10_half 10_full 100_half 100_full 1000_full [master slave None] flow_control [enabled disabled] learning [enabled disabled] state [enabled disabled]
show ports	<portlist>

Each command is listed, in detail, in the following sections.

config ports	
Purpose	Used to configure the switch's Ethernet port settings.
Syntax	config ports <portlist all> speed [auto 10_half 10_full 100_half 100_full 1000_full] [master slave None] flow_control [enabled disabled] learning [enabled disabled] state [enabled disabled]
Description	This command allows for the configuration of the switch's Ethernet ports. Only the ports listed in the <portlist> will be affected.
Parameters	<p>all – Configure all ports on the switch.</p> <p><portlist> – Specifies a range of ports to be configured. The port list is specified by listing the lowest slot number and the beginning port number on that slot, separated by a colon. Then the highest slot number, and the highest port number of the range (also separated by a colon) are specified. The beginning and end of the port list range are separated by a dash. For example, 1:3 specifies slot number 1, port 3. 2:4 specifies slot number 2, port 4. 1:3-2:4 specifies all of the ports between slot 1, port 3 and slot 2, port 4 – in numerical order.</p> <p>auto – Enables auto-negotiation for the specified range of ports.</p> <p>[10 100 1000] – Configures the speed in Mbps for the specified range of ports.</p> <p>[half full] – Configures the specified range of ports as either full- or half-duplex.</p> <p>[master slave None] This parameter denotes whether the ports selected will be</p>

config ports

of the master switch or the slave switch and is only used when the port speed is selected to be 1000_full. *None* denotes the switch will server no role for stacking.

flow_control [enable|disable] – Enable or disable flow control for the specified ports.

learning [enabled|disabled] – Enables or disables the MAC address learning on the specified range of ports.

state [enable|disable] – Enables or disables the specified range of ports.

Restrictions

Only administrator-level users can issue this command.

Example usage:

To configure the speed of port 3 to be 10 Mbps, full duplex, learning and state enabled:

```
DES-6500:4#config ports 1:3 speed 10_full learning enabled  
state enabled
```

```
Command: config ports 1:3 speed 10_full learning enabled  
state enabled
```

```
Success.
```

```
DES-6500:4#
```

show ports

Purpose

Used to display the current configuration of a range of ports.

Syntax

```
show ports <portlist>
```

Description

This command is used to display the current configuration of a range of ports.

Parameters

<portlist> – Specifies a range of ports to be displayed. The port list is specified by listing the lowest slot number and the beginning port number on that slot, separated by a colon. Then the highest slot number, and the highest port number of the range (also separated by a colon) are specified. The beginning and end of the port list range are separated by a dash. For example, 1:3 specifies slot number 1, port 3. 2:4 specifies slot number 2, port 4. 1:3-2:4 specifies all of the ports between slot 1, port 3 and slot 2, port 4 – in numerical order.

Restrictions

None.

Example usage:

To display the configuration of all ports on a standalone switch:

DES-6500:4#show ports

Command show ports:

Port	Port Address	Settings	Connection
State	Speed/Duplex/FlowCtrl	Speed/Duplex/FlowCtrl	Learning
1	Enabled	Auto/Enabled	Link Down
2	Enabled	Auto/Enabled	Link Down
3	Enabled	Auto/Enabled	Link Down
4	Enabled	Auto/Enabled	Link Down
5	Enabled	Auto/Enabled	Link Down
6	Enabled	Auto/Enabled	Link Down
7	Enabled	Auto/Enabled	Link Down
8	Enabled	Auto/Enabled	Link Down
9	Enabled	Auto/Enabled	Link Down
10	Enabled	Auto/Enabled	100M/Full/802.3x
11	Enabled	Auto/Enabled	Link Down
12	Enabled	Auto/Enabled	Link Down
13	Enabled	Auto/Disabled	Link Down
14	Enabled	Auto/Disabled	Link Down
15	Enabled	Auto/Disabled	Link Down
16	Enabled	Auto/Disabled	Link Down
17	Enabled	Auto/Disabled	Link Down
18	Enabled	Auto/Disabled	Link Down
19	Enabled	Auto/Disabled	Link Down
20	Enabled	Auto/Disabled	Link Down

PORT SECURITY COMMANDS

The switch port security commands in the Command Line Interface (CLI) are listed (along with the appropriate parameters) in the following table.

Command	Parameters
config port_security ports	[<portlist> all] {admin_state [enabled disabled] max_learning_addr <max_lock_no 0-64> lock_address_mode [DeleteOnTimeout DeleteOnReset]}
show port_security	{ports <portlist>}

Each command is listed, in detail, in the following sections.

config port_security ports

Purpose	Used to configure port security settings.
Syntax	config port_security [<portlist> all] { admin_state [enabled disabled] max_learning_addr <max_lock_no 0-64> lock_address_mode [DeleteOnTimeout DeleteOnReset]}
Description	This command allows for the configuration of the port security feature. Only the ports listed in the <portlist> are effected.
Parameters	<p>portlist – specifies a range of ports to be configured. The port list is specified by listing the lowest slot number and the beginning port number on that slot, separated by a colon. Then the highest slot number, and the highest port number of the range (also separated by a colon) are specified. The beginning and end of the port list range are seperated by a dash. For example, 1:3 specifies slot number 1, port 3. 2:4 specifies slot number 2, port 4. 1:3-2:4 specifies all of the ports between slot 1, port 3 and slot 2, port 4 – in numerical order.</p> <p>all – configure port security for all ports on the switch.</p> <p>admin_state [enable disable] – enable or disable port security for the listed ports.</p> <p>max_learning_addr <1-64> - use this to limit the number of MAC addresses dynamically listed in the FDB for the ports.</p> <p>lock_address_mode[DeleteOnTimout DeleteOnReset] – delete FDB dynamic entries for the ports on timeout of the FDB (see Forwarding Database Commands). Specify DeleteOnReset to delete all FDB entries, including static entries upon system reset or rebooting.</p>
Restrictions	Only administrator-level users can issue this command.

Example usage:

To configure the port security:

```
DES-6500:4#config port_security ports 5:1-5:5 admin_state
enabled max_learning_addr 5 lock_address_mode Permanent
Command: config port_security ports 5:1-5:5 admin_state
enable max_learning_addr 5 lock_address_mode
DeleteOnReset
Success
DES-6500:4#
```

show port_security

Purpose	Used to display the current port security configuration.
Syntax	show port_security {ports <portlist>}
Description	This command is used to display port security information of the switch ports. The information displayed includes port security admin state, maximum number of learning address and lock mode.
Parameters	<portlist> – specifies a range of ports to be viewed. The port list is specified by listing the lowest slot number and the beginning port number on that slot, separated by a colon. Then the highest slot number, and the highest port number of the range (also separated by a colon) are specified. The beginning and end of the port list range are separated by a dash. For example, 1:3 specifies slot number 1, port 3. 2:4 specifies slot number 2, port 4. 1:3-2:4 specifies all of the ports between slot 1, port 3 and slot 2, port 4 – in numerical order.
Restrictions	None.

Example usage:

To display the port security configuration:

```
DES-6500:4#show port_security ports 1-24
Command: show port_security ports 1-24

Port# Admin State Max. Learning Addr. Lock Address
Mode
-----
1:1 Disabled 1 DeleteOnReset
1:2 Disabled 1 DeleteOnReset
1:3 Disabled 1 DeleteOnReset
1:4 Disabled 1 DeleteOnReset
1:5 Disabled 1 DeleteOnReset
1:6 Disabled 1 DeleteOnReset
1:7 Enabled 10 DeleteOnReset
1:8 Disabled 1 DeleteOnReset
1:9 Disabled 1 DeleteOnReset
1:10 Disabled 1 DeleteOnReset
1:11 Disabled 1 DeleteOnReset
1:12 Disabled 1 DeleteOnReset
1:13 Disabled 1 DeleteOnReset
1:14 Disabled 1 DeleteOnReset
1:15 Disabled 1 DeleteOnReset
1:16 Disabled 1 DeleteOnReset
1:17 Disabled 1 DeleteOnReset
1:18 Disabled 1 DeleteOnReset
1:19 Disabled 1 DeleteOnReset
1:20 Disabled 1 DeleteOnRese
```

NETWORK MANAGEMENT (SNMP) COMMANDS

The network management commands in the Command Line Interface (CLI) are listed (along with the appropriate parameters) in the following table.

The DES-6500 supports the Simple Network Management Protocol (SNMP) versions 1, 2c, and 3. You can specify which version of the SNMP you want to use to monitor and control the switch. The three versions of SNMP vary in the level of security provided between the management station and the network device. The following table lists the security features of the three SNMP versions:

SNMP Version	Authentication Method	Description
v1	Community String	Community String is used for authentication – NoAuthNoPriv
v2c	Community String	Community String is used for authentication – NoAuthNoPriv
v3	Username	Username is used for authentication – NoAuthNoPriv
v3	MD5 or SHA	Authentication is based on the HMAC-MD5 or HMAC-SHA algorithms – AuthNoPriv
v3	MD5 DES or SHA DES	Authentication is based on the HMAC-MD5 or HMAC-SHA algorithms – AuthPriv. DES 56-bit encryption is added based on the CBC-DES (DES-56) standard

Command	Parameters
create snmp user	create snmp user <username 32> <groupname 32> {encrypted [by_password auth [md5(2) <auth_password 8-16 > sha <auth_password 8-20 >] priv [none des <priv_password 8-16>] by_key auth [md5 <auth_key 32-32> sha <auth_key 40-40>] priv [none des <priv_key 32-32>]]}
delete snmp user	<SNMP_name 32>
show snmp user	
create snmp view	<view_name 32> <oid> view_type [included excluded]
delete snmp view	<view_name 32> [all oid]
show snmp view	<view_name 32>
create snmp community	<community_string 32> view <view_name 32> [read_only read_write]
delete snmp community	<community_string 32>
show snmp community	<community_string 32>

Command	Parameters
config snmp engineID	<snmp_engineID 10-32>
show snmp engineID	
create snmp group	<groupname 32> v1 v2c v3 noauth_nopriv auth_nopriv auth_priv read_view <view_name 32> write_view <view_name 32> notify_view <view_name 32>
delete snmp group	<groupname 32>
show snmp groups	
create snmp host	<ipaddr> v1 v2c v3 noauth_nopriv auth_nopriv auth_priv <auth_string 32>
delete snmp host	<ipaddr> <auth_string 32>
show snmp host	<ipaddr>
create trusted_host	<ipaddr>
delete trusted_host	<ipaddr>
show trusted_host	<ipaddr>
enable snmp traps	
enable snmp_authenticate traps	
show snmp traps	
disable snmp traps	
disable snmp authenticate_traps	

Command	Parameters
config snmp system_contact	<sw_contact>
config snmp system_location	<sw_location>
config snmp system_name	<sw_name>
enable rmon	
disable rmon	

Each command is listed, in detail, in the following sections.

create snmp user

Purpose	Used to create a new SNMP user and adds the user to an SNMP group that is also created by this command.
Syntax	create snmp user <SNMP_name 32> <groupname 32> {encrypted [by_password auth [md5 <auth_password 8-16 > sha <auth_password 8-20 >] priv [none des <priv_password 8-16>]]by_key auth [md5 <auth_key 32-32> sha <auth_key 40-40>] priv [none des <priv_key 32-32>]}}
Description	The create snmp user command creates a new SNMP user and adds the user to an SNMP group that is also created by this command.
Parameters	<p><SNMP_name 32> – An alphanumeric name of up to 32 characters that will identify the new SNMP user.</p> <p><groupname 32> – An alphanumeric name of up to 32 characters that will identify the SNMP group the new SNMP user will be associated with.</p> <p>by_password – Requires the SNMP user to enter a password for authentication and privacy. The password is defined by specifying the auth_password below. This method is recommended.</p> <p>by_key - Requires the SNMP user to enter a encryption key for authentication and privacy. The key is defined by specifying the priv_password below. This method is not recommended.</p> <p>Message integrity – ensures that packets have not been tampered with during transit.</p> <p>Authentication – determines if an SNMP message is from a valid source.</p> <p>Encryption – scrambles the contents of messages to prevent it being viewed by an unauthorized source.</p> <p>encrypted – Specifies that the password will be in an encrypted format.</p> <p>auth [md5 sha] – Initiate an authentication-level setting session.</p> <p>md5 – Specifies that the HMAC-MD5-96 authentication level will be used.</p>

create snmp user

sha – Specifies that the HMAC-SHA-96 authentication level will be used.

<auth_password 8-20> – An alphanumeric string of between 8 and 20 characters that will be used to authorize the agent to receive packets for the host.

des <priv_password 8-16> – An alphanumeric string of between 8 and 16 characters that will be used to encrypt the contents of messages the host sends to the agent.

Restrictions

Only administrator-level users can issue this command.

Example usage:

To create an SNMP user on the switch:

```
DES-6500:4#create snmp user dlink default encrypted  
by_password auth md5 auth_password priv none  
Command: create snmp user dlink default encrypted  
by_password auth md5 auth_password priv none
```

Success.

```
DES-6500:4#
```

delete snmp user

Purpose

Used to remove an SNMP user from an SNMP group and also to delete the associated SNMP group.

Syntax

delete snmp user <SNMP_name 32>

Description

The **delete snmp user** command removes an SNMP user from its SNMP group and then deletes the associated SNMP group.

Parameters

< SNMP_name 32> – An alphanumeric string of up to 32 characters that identifies the SNMP user that will be deleted.

Restrictions

Only administrator-level users can issue this command.

Example usage:

To delete a previously entered SNMP user on the switch:

```
DES-6500:4#delete snmp user dlink
```

```
Command: delete snmp user dlink
```

```
Success.
```

```
DES-6500:4#
```

show snmp user

Purpose	Used to display information about each SNMP username in the SNMP group username table.
Syntax	show snmp user
Description	The show snmp user command displays information about each SNMP username in the SNMP group username table.
Parameters	None.
Restrictions	Only administrator-level users can issue this command.

Example usage:

To display the SNMP users currently configured on the switch:

```
DES-6500:4#show snmp user
```

```
Command: show snmp user
```

Username	Group Name	VerAuthPriv
-----	-----	-----
initial	initial	V3 None None

```
Total Entries: 1
```

```
DES-6500:4#
```

create snmp view

Purpose	Used to assign views to community strings to limit which MIB objects an SNMP manager can access.
---------	--

Syntax	create snmp view <view_name 32> <oid> view_type [included excluded]
--------	--

create snmp view

Description	The create snmp view command assigns views to community strings to limit which MIB objects an SNMP manager can access.
Parameters	<p><view_name 32> – An alphanumeric string of up to 32 characters that identifies the SNMP view that will be created.</p> <p><oid> – The object ID that identifies an object tree (MIB tree) that will be included or excluded from access by an SNMP manager.</p> <p>included – Include this object in the list of objects that an SNMP manager can access.</p> <p>excluded – Exclude this object from the list of objects that an SNMP manager can access.</p>
Restrictions	Only administrator-level users can issue this command.

Example usage:

To create an SNMP view:

```
DES-6500:4#create snmp view dlinkview 1.3.6 view_type
included
Command: create snmp view dlinkview 1.3.6 view_type
included

Success.

DES-6500:4#
```

delete snmp view

Purpose	Used to remove an SNMP view entry previously created on the switch.
Syntax	delete snmp view <view_name 32> [all <oid>]
Description	The delete snmp view command is used to remove an SNMP view previously created on the switch.
Parameters	<view_name 32> – An alphanumeric string of up to 32 characters that identifies the SNMP view to be deleted.

delete snmp view

all – Specifies that all of the SNMP views on the switch will be deleted.

<oid> – The object ID that identifies an object tree (MIB tree) that will be deleted from the switch.

Restrictions Only administrator-level users can issue this command.

Example usage:

To delete a previously configured SNMP view from the switch:

```
DES-6500:4#delete snmp view dlinkview all
```

```
Command: delete snmp view dlinkview all
```

```
Success.
```

```
DES-6500:4#
```

show snmp view

Purpose Used to display an SNMP view previously created on the switch.

Syntax **show snmp view <view_name 32>**

Description The **show snmp view** command displays an SNMP view previously created on the switch.

Parameters <view_name 32> – An alphanumeric string of up to 32 characters that identifies the SNMP view that will be displayed.

Restrictions None.

Example usage:

To display SNMP view configuration:

DES-6500:4#show snmp view

Command: show snmp view

Vacm View Table Settings

View Name	Subtree	View Type
ReadView	1	Included
WriteView	1	Included
NotifyView	1.3.6	Included
restricted	1.3.6.1.2.1.1	Included
restricted	1.3.6.1.2.1.11	Included
restricted	1.3.6.1.6.3.10.2.1	Included
restricted	1.3.6.1.6.3.11.2.1	Included
restricted	1.3.6.1.6.3.15.1.1	Included
CommunityView	1	Included
CommunityView	1.3.6.1.6.3	Excluded
CommunityView	1.3.6.1.6.3.1	Included

Total Entries: 11

DES-6500:4#

create snmp community

Purpose Used to create an SNMP community string to define the relationship between the SNMP manager and an agent. The community string acts like a password to permit access to the agent on the switch. One or more of the following characteristics can be associated with the community string:

An Access List of IP addresses of SNMP managers that are permitted to use the community string to gain access to the switch's SNMP agent.

An MIB view that defines the subset of all MIB objects that will be accessible to the SNMP community.

Read|write or read-only level permission for the MIB objects accessible to the SNMP community.

Syntax **create snmp community <community_string 32> view <view_name 32> [read_only|read_write]**

Description The **create snmp community** command is used to create an SNMP community string and to assign access-limiting characteristics to this community string.

Parameters <community_string 32> – An alphanumeric string of up to 32 characters that is used to identify members of an SNMP community. This string is used like a password to give remote SNMP managers access to MIB

create snmp community

objects in the switch's SNMP agent.

<view_name 32> – An alphanumeric string of up to 32 characters that is used to identify the group of MIB objects that a remote SNMP manager is allowed to access on the switch.

read_only – Specifies that SNMP community members using the community string created with this command can only read the contents of the MIBs on the switch.

read_write – Specifies that SNMP community members using the community string created with this command can read from and write to the contents of the MIBs on the switch.

Restrictions

Only administrator-level users can issue this command.

Example usage:

To create the SNMP community string “dlink:”

```
DES-6500:4#create snmp community dlink view ReadView  
read_write
```

```
Command: create snmp community dlink view ReadView  
read_write
```

```
Success.
```

delete snmp community

Purpose

Used to remove a specific SNMP community string from the switch.

Syntax

```
delete snmp community <community_string 32>
```

Description

The **delete snmp community** command is used to remove a previously defined SNMP community string from the switch.

Parameters

<community_string 32> – An alphanumeric string of up to 32 characters that is used to identify members of an SNMP community. This string is used like a password to give remote SNMP managers access to MIB objects in the switch's SNMP agent.

Restrictions

Only administrator-level users can issue this command.

Example usage:

To delete the SNMP community string “dlink:”

DES-6500:4#delete snmp community dlink

Command: delete snmp community dlink

Success.

DES-6500:4#

show snmp community

Purpose	Used to display SNMP community strings configured on the switch.
Syntax	show snmp community <community_string 32>
Description	The show snmp community command is used to display SNMP community strings that are configured on the switch.
Parameters	<community_string 32> – An alphanumeric string of up to 32 characters that is used to identify members of an SNMP community. This string is used like a password to give remote SNMP managers access to MIB objects in the switch's SNMP agent.
Restrictions	None.

Example usage:

To display the currently entered SNMP community strings:

DES-6500:4#show snmp community

Command: show snmp community

SNMP Community Table

Community Name	View Name	Access Right
dlink	ReadView	read_write
private	CommunityView	read_write
public	CommunityView	read_only

Total Entries: 3

config snmp engineID

Purpose	Used to configure a name for the SNMP engine on the switch.
Syntax	config snmp engineID <snmp_engineID 10-32>
Description	The config snmp engineID command configures a name for the SNMP engine on the switch.
Parameters	<snmp_engineID 10-32> – An alphanumeric string that will be used to identify the SNMP engine on the switch.
Restrictions	Only administrator-level users can issue this command.

Example usage:

To give the SNMP agent on the switch the name “0035636666”

```
DES6500:4#config snmp engineID 0035636666
Command: config snmp engineID 0035636666

Success.

DES-6500:4#
```

show snmp engineID

Purpose	Used to display the identification of the SNMP engine on the switch.
Syntax	show snmp engineID
Description	The show snmp engineID command displays the identification of the SNMP engine on the switch.
Parameters	None.
Restrictions	None.

Example usage:

To display the current name of the SNMP engine on the switch:

```
DES-6500:4#show snmp engineID
Command: show snmp engineID

SNMP Engine ID : 0035636666

DES-6500:4#
```

create snmp group

Purpose	Used to create a new SNMP group, or a table that maps SNMP users to SNMP views.
Syntax	create snmp group <groupname 32> [v1 v2c v3 [noauth_nopriv auth_nopriv auth_priv]] [read_view <view_name 32> write_view <view_name 32> notify_view <view_name 32>]
Description	The create snmp group command creates a new SNMP group, or a table that maps SNMP users to SNMP views.
Parameters	<p><groupname 32> – An alphanumeric name of up to 32 characters that will identify the SNMP group the new SNMP user will be associated with.</p> <p>v1 – Specifies that SNMP version 1 will be used. The Simple Network Management Protocol (SNMP), version 1, is a network management protocol that provides a means to monitor and control network devices.</p> <p>v2c – Specifies that SNMP version 2c will be used. The SNMP v2c supports both centralized and distributed network management strategies. It includes improvements in the Structure of Management Information (SMI) and adds some security features.</p> <p>v3 – Specifies that the SNMP version 3 will be used. SNMP v3 provides secure access to devices through a combination of authentication and encrypting packets over the network. SNMP v3 adds:</p> <p>Message integrity – ensures that packets have not been tampered with during transit.</p> <p>Authentication – determines if an SNMP message is from a valid source.</p> <p>Encryption – scrambles the contents of messages to prevent it being viewed by an unauthorized source.</p> <p>noauth_nopriv – Specifies that there will be no authorization and no encryption of packets sent between the switch and a remote SNMP manager.</p> <p>auth_nopriv – Specifies that authorization will be required, but there will be no encryption of packets sent between the switch and a remote SNMP manager.</p> <p>auth_priv – Specifies that authorization will be required, and that packets sent between the switch and a remote SNMP manager will be encrypted.</p> <p>read_view – Specifies that the SNMP group being created can request SNMP messages.</p> <p>write_view – Specifies that the SNMP group being created has write privileges.</p> <p><view_name 32> – An alphanumeric string of up to 32 characters that is used to identify the group of MIB objects that a remote SNMP manager</p>

create snmp group

is allowed to access on the switch.

notify_view – Specifies that the SNMP group being created can receive SNMP trap messages generated by the switch's SNMP agent.

Restrictions

Only administrator-level users can issue this command.

Example usage:

To create an SNMP group named “sg1:”

```
DES-6500:4#create snmp group sg1 v3 noauth_nopriv  
read_view v1 write_view v1 notify_view v1
```

```
Command: create snmp group sg1 v3 noauth_nopriv  
read_view v1 write_view v1 notify_view v1
```

Success.

```
DES-6500:4#
```

delete snmp group

Purpose

Used to remove an SNMP group from the switch.

Syntax

```
delete snmp group <groupname 32>
```

Description

The **delete snmp group** command is used to remove an SNMP group from the switch.

Parameters

<groupname 32> – An alphanumeric name of up to 32 characters that will identify the SNMP group the new SNMP user will be associated with.

Restrictions

Only administrator-level users can issue this command.

Example usage:

To delete the SNMP group named “sg1”.

```
DES-6500:4#delete snmp group sg1
```

```
Command: delete snmp group sg1
```

Success.

```
DES-6500:4#
```

show snmp groups

Purpose	Used to display the group-names of SNMP groups currently configured on the switch. The security model, level, and status of each group are also displayed.
Syntax	show snmp groups
Description	The show snmp groups command displays the group-names of SNMP groups currently configured on the switch. The security model, level, and status of each group are also displayed.
Parameters	None.
Restrictions	None.

Example usage:

To display the currently configured SNMP groups on the switch:

```
DES-6500:4#show snmp groups
Command: show snmp groups
Vacm Access      Table Settings

Group Name      : Group3
ReadView Name   : ReadView
WriteView Name  : WriteView
Notify View Name : NotifyView
Security Model  : SNMPv3
Security Level  : NoAuthNoPriv

Group Name      : Group4
ReadView Name   : ReadView
WriteView Name  : WriteView
Notify View Name : NotifyView
Security Model  : SNMPv3
Security Level  : authNoPriv
```

create snmp host

Purpose	Used to create a recipient of SNMP traps generated by the switch's SNMP agent.
Syntax	create snmp host <ipaddr> [v1 v2c v3 [noauth_nopriv auth_nopriv auth_priv]] <auth_string 32>

create snmp host

Description	The create snmp host command creates a recipient of SNMP traps generated by the switch's SNMP agent.
Parameters	<p><ipaddr> – The IP address of the remote management station that will serve as the SNMP host for the switch.</p> <p>v1 – Specifies that SNMP version 1 will be used. The Simple Network Management Protocol (SNMP), version 1, is a network management protocol that provides a means to monitor and control network devices.</p> <p>v2c – Specifies that SNMP version 2c will be used. The SNMP v2c supports both centralized and distributed network management strategies. It includes improvements in the Structure of Management Information (SMI) and adds some security features.</p> <p>v3 – Specifies that the SNMP version 3 will be used. SNMP v3 provides secure access to devices through a combination of authentication and encrypting packets over the network. SNMP v3 adds:</p> <p>Message integrity – ensures that packets have not been tampered with during transit.</p> <p>Authentication – determines if an SNMP message is from a valid source.</p> <p>Encryption – scrambles the contents of messages to prevent it being viewed by an unauthorized source.</p> <p>noauth_nopriv – Specifies that there will be no authorization and no encryption of packets sent between the switch and a remote SNMP manager.</p> <p>auth_nopriv – Specifies that authorization will be required, but there will be no encryption of packets sent between the switch and a remote SNMP manager.</p> <p>auth_priv – Specifies that authorization will be required, and that packets sent between the switch and a remote SNMP manger will be encrypted.</p> <p><auth_sting 32> – An alphanumeric string used to authorize a remote SNMP manager to access the switch's SNMP agent.</p>
Restrictions	Only administrator-level users can issue this command.

Example usage:

To create an SNMP host to receive SNMP messages:


```

DES-6500:4#create snmp host 10.48.74.100 v3 auth_priv
public
Command: create snmp host 10.48.74.100 v3 auth_priv public

Success.

DES-6500:4#

```

delete snmp host

Purpose	Used to remove a recipient of SNMP traps generated by the switch's SNMP agent.
Syntax	delete snmp host <ipaddr> <auth_string 32>
Description	The delete snmp host command deletes a recipient of SNMP traps generated by the switch's SNMP agent.
Parameters	<p><ipaddr> – The IP address of a remote SNMP manager that will receive SNMP traps generated by the switch's SNMP agent.</p> <p><auth_string 32> – An alphanumeric string used to authorize a remote SNMP manager to access the switch's SNMP agent.</p>
Restrictions	Only administrator-level users can issue this command.

Example usage:

To delete an SNMP host entry:

```

DES-6500:4#delete snmp host 10.48.74.100
Command: delete snmp host 10.48.74.100

Success.

DES-6500:4#

```

show snmp host

Purpose	Used to display the recipient of SNMP traps generated by the switch's SNMP agent.
Syntax	show snmp host <ipaddr>
Description	The show snmp host command is used to display the IP addresses and configuration information of remote SNMP managers that are designated as recipients of SNMP traps that are generated by the switch's SNMP agent.

show snmp host

Parameters	<ipaddr> – The IP address of a remote SNMP manager that will receive SNMP traps generated by the switch's SNMP agent.
Restrictions	None.

Example usage:

```
DES-6500:4#show snmp host
Command: show snmp host

SNMP Host Table
Host IP Address  SNMP Version  Community Name/SNMPv3
                  User Name
-----
10.48.76.23      V2c           private
10.48.74.100    V3 authpriv   public

Total Entries: 2
```

To display the currently configured SNMP hosts on the switch:

create trusted_host

Purpose	Used to create the trusted host.
Syntax	create trusted_host <ipaddr>
Description	The create trusted_host command creates the trusted host. The switch allows you to specify up to four IP addresses that are allowed to manage the switch via in-band SNMP or TELNET based management software. These IP addresses must be members of the Management VLAN. If no IP addresses are specified, then there is nothing to prevent any IP address from accessing the switch, provided the user knows the Username and Password.
Parameters	<ipaddr> – The IP address of the trusted host.
Restrictions	Only administrator-level users can issue this command.

Example usage:

To create the trusted host:

```
DES-6500:4#create trusted_host 10.48.74.121
Command: create trusted_host 10.48.74.121

Success.

DES-6500:4#
```

show trusted_host

Purpose	Used to display a list of trusted hosts entered on the switch using the create trusted_host command above.
Syntax	show trusted_host <ipaddr>
Description	This command is used to display a list of trusted hosts entered on the switch using the create trusted_host command above.
Parameters	<ipaddr> - Enter the IP address of the trusted host to view information for. Entering this command without this parameter will list the information for all trusted hosts.
Restrictions	none.

Example Usage:

To display the list of trust hosts:

```
DES-6500:4#show trusted_host
Command: show trusted_host

Management Stations
IP Address
-----
10.48.74.121

Total Entries: 1

DES-6500:4#
```

delete trusted_host

Purpose	Used to delete a trusted host entry made using the create trusted_host command above.
Syntax	delete trusted host <ipaddr>
Description	This command is used to delete a trusted host entry made using the create trusted_host command above.

delete trusted_host

Parameters	<ipaddr> – The IP address of the trusted host.
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To delete a trusted host with an IP address 10.48.74.121:

```
DES-6500:4#delete trusted_host 10.48.74.121
Command: delete trusted_host 10.48.74.121

Success.

DES-6500:4#
```

enable snmp traps

Purpose	Used to enable SNMP trap support.
Syntax	enable snmp traps
Description	The enable snmp traps command is used to enable SNMP trap support on the switch.
Parameters	none.
Restrictions	Only administrator-level users can issue this command.

Example usage:

To enable SNMP trap support on the switch:

```
DES-6500:4#enable snmp traps
Command: enable snmp traps

Success.

DES-6500:4#
```

enable snmp authenticate traps

Purpose	Used to enable SNMP authentication trap support.
Syntax	enable snmp authenticate_traps
Description	This command is used to enable SNMP authentication trap support on the Switch.
Parameters	none.
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To turn on SNMP authentication trap support:

```
DES-6500:4#enable snmp authenticate_traps
Command: enable snmp authenticate_traps

Success.

DES-6500:4#
```

show snmp traps

Purpose	Used to show SNMP trap support on the switch .
Syntax	show snmp traps
Description	This command is used to view the SNMP trap support status currently configured on the Switch.
Parameters	none.
Restrictions	Only administrator-level users can issue this command.

Example usage:

To view the current SNMP trap support:

```

DES-6500:4#show snmp traps
Command: show snmp traps

SNMP Traps : Enabled
Authenticate Traps : Enabled

DES-6500:4#

```

disable snmp traps

Purpose	Used to disable SNMP trap support on the switch.
Syntax	disable snmp traps
Description	This command is used to disable SNMP trap support on the Switch.
Parameters	none.
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To prevent SNMP traps from being sent from the Switch:

```

DES-6500:4#disable snmp traps
Command: disable snmp traps

Success.

DES-6500:4#

```

disable snmp authenticate traps

Purpose	Used to disable SNMP authentication trap support.
Syntax	disable snmp authenticate traps
Description	This command is used to disable SNMP authentication support on the Switch.
Parameters	none.
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To disable the SNMP authentication trap support:

DES-6500:4#disable snmp authenticate traps

Command: disable snmp authenticate traps

Success.

DES-6500:4#

config snmp system_contact

Purpose	Used to enter the name of a contact person who is responsible for the switch.
Syntax	config snmp system_contact <sw_contact>
Description	The config snmp system_contact command is used to enter the name and/or other information to identify a contact person who is responsible for the switch. A maximum of 255 character can be used.
Parameters	<sw_contact> - A maximum of 255 characters is allowed. A NULL string is accepted if there is no contact.
Restrictions	Only administrator-level users can issue this command.

Example usage:

To configure the switch contact to “MIS Department II”:

DES-6500:4#config snmp system_contact MIS Department II

Command: config snmp system_contact MIS Department II

Success.

DES-6500:4#

config snmp system_location

Purpose	Used to enter a description of the location of the switch.
Syntax	config snmp system_location <sw_location>
Description	The config snmp system_location command is used to enter a description of the location of the switch. A maximum of 255 characters can be used.
Parameters	<sw_location> - A maximum of 255 characters is allowed. A NULL string is accepted if there is no location desired.

config snmp system_location

Restrictions	Only administrator-level users can issue this command.
--------------	--

Example usage:

To configure the switch location for “HQ 5F”:

```
DES-6500:4#config snmp system_location HQ 5F
Command: config snmp system_location HQ 5F

Success.

DES-6500:4#
```

config snmp system_name

Purpose	Used to configure the name for the switch.
Syntax	config snmp system_name <sw_name>
Description	The config snmp system_name command configures the name of the switch.
Parameters	<sw_name> - A maximum of 255 characters is allowed. A NULL string is accepted if no name is desired.
Restrictions	Only administrator-level users can issue this command.

Example usage:

To configure the switch name for “DES-6500 Stackable Switch”:

```
DES-6500:4#config snmp system_name DES-6500 Switch
Command: config snmp system_name DES-6500 Switch

Success.

DES-6500:4#
```


enable rmon

Purpose	Used to enable RMON on the switch.
Syntax	enable rmon
Description	This command is used, in conjunction with the disable rmon command below, to enable and disable remote monitoring (RMON) on the switch.
Parameters	none.
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To enable RMON:

```
DES-6500:4#enable rmon
```

```
Command: enable rmon
```

```
Success.
```

```
DES-6500:4#
```

disable rmon

Purpose	Used to disable RMON on the switch.
Syntax	disable rmon
Description	This command is used, in conjunction with the enable rmon command above, to enable and disable remote monitoring (RMON) on the switch.
Parameters	none.
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To disable RMON:

DES-6500:4#disable rmon

Command: disable rmon

Success.

DES-6500:4#

SWITCH UTILITY COMMANDS

The download/upload commands in the Command Line Interface (CLI) are listed (along with the appropriate parameters) in the following table.

Command	Parameters
download	[firmware_fromTFTP <ipaddr> <path_filename 64> unit [all_line_card cpu <unitid 1-8>]] cfg_fromTFTP <ipaddr> <path_filename 64>]
upload	cfg_toTFTP log_toTFTP <ipaddr> <path_filename 64>
ping	<ipaddr> {times <value 0-255>} {timeout <sec 1-99>}

Each command is listed, in detail, in the following sections.

download

Purpose	Used to download and install new firmware or a switch configuration file from a TFTP server.
Syntax	download [firmware_fromTFTP <ipaddr> <path_filename 64> unit [all_line_card cpu <unitid 1-8>]]cfg_fromTFTP <ipaddr> <path_filename 64>]
Description	This command is used to download a new firmware or a switch configuration file from a TFTP server.
Parameters	<p>firmware_fromTFTP – Download and install new firmware on the switch from a TFTP server.</p> <p>configuration – Download a switch configuration file from a TFTP server.</p> <p><ipaddr> – The IP address of the TFTP server.</p> <p><path_filename 64> – The DOS path and filename of the firmware or switch configuration file on the TFTP server. For example, C:\3226S.had.</p> <p>unit [all_line_card <unitid 1-8>] – all specifies all installed modules except the CPU module, <unitid> is the unit id of the module that will receive the download, if you want to update only one module.</p>
Restrictions	The TFTP server must be on the same IP subnet as the switch. Only administrator-level users can issue this command.

Example usage:

To download a cfm_fromTFTP:

```
DES6500:4#download cfm_fromTFTP 10.90.90.88 c:\log\cfg.txt
Command: download cfm_fromTFTP 10.90.90.88 c:\log\cfg.txt

Connecting to server..... Done.
Download configuration..... Done.

Success.

DES-6500:4#
```

upload	
Purpose	Used to upload the current switch settings or the switch history log to a TFTP server.
Syntax	upload [cfg_toTFTP log_toTFTP] <ipaddr> <path_filename 64>
Description	This command is used to upload either the switch's current settings or the switch's history log to a TFTP server.
Parameters	<p>cfg_toTFTP – Specifies that the switch's current settings will be uploaded to the TFTP server.</p> <p>log_toTFTP – Specifies that the switch history log will be uploaded to the TFTP server.</p> <p><ipaddr> – The IP address of the TFTP server. The TFTP server must be on the same IP subnet as the switch.</p> <p><path_filename 64> – Specifies the location of the switch configuration file on the TFTP server. This file will be replaced by the uploaded file from the switch.</p>
Restrictions	The TFTP server must be on the same IP subnet as the switch. Only administrator-level users can issue this command.

Example usage:

To upload a configuration file:

```

DES6500:4#upload cfg_toTFTP 10.90.90.88 c:\log\cfg.txt
Command: upload cfg_toTFTP 10.90.90.88 c:\log\cfg.txt

Connecting to server..... Done.
Upload configuration..... Done.

Success.

DES-6500:4#

```

ping	
Purpose	Used to test the connectivity between network devices.
Syntax	ping <ipaddr> {times <value 0-255>} {timeout <sec 1-99>}
Description	The ping command sends Internet Control Message Protocol (ICMP) echo messages to a remote IP address. The remote IP address will then “echo” or return the message. This is used to confirm connectivity between the switch and the remote device.
Parameters	<p><ipaddr> - Specifies the IP address of the host.</p> <p>times - The number of individual ICMP echo messages to be sent. A value of 0 will send an infinite ICMP echo messages. The maximum value is 255. The default is 0.</p> <p>timeout - Defines the time-out period while waiting for a response from the remote device. A value of 1 to 99 seconds can be specified. The default is 1 second</p>
Restrictions	None.

```

DES-6500:4#ping 10.48.74.121 times 4
Command: ping 10.48.74.121

Reply from 10.48.74.121, time<10ms
Reply from 10.48.74.121, time<10ms
Reply from 10.48.74.121, time<10ms
Reply from 10.48.74.121, time<10ms

Ping statistics for 10.48.74.121
Packets: Sent =4, Received =4, Lost =0

DES-6500:4#

```


NETWORK MONITORING COMMANDS

The network monitoring commands in the Command Line Interface (CLI) are listed (along with the appropriate parameters) in the following table.

Command	Parameters
show packet ports	<portlist>
show error ports	<portlist>
show utilization	
clear counters	ports <portlist>
clear log	
show log	index <value_list>
enable syslog	
disable syslog	
show syslog	
create syslog host	<index 1-4> severity informational warning all facility local0 local1 local2 local3 local4 local5 local6 local7 udp_port <int> ipaddress <ipaddr> state [enabled disabled]
config syslog host	all <index 1-4> severity informational warning all facility local0 local1 local2 local3 local4 local5

Command	Parameters
	local6 local7 udp_port <int> ipaddress <ipaddr> state [enabled disabled]
delete syslog host	<index 1-4> all
show syslog host	<index 1-4>
show stack_information	

Each command is listed, in detail, in the following sections.

show packet ports

Purpose	Used to display statistics about the packets sent and received by the switch.
Syntax	show packet ports <portlist>
Description	This command is used to display statistics about packets sent and received by ports specified in the port list.
Parameters	<portlist> – specifies a range of ports to be displayed. The port list is specified by listing the lowest slot number and the beginning port number on that slot, separated by a colon. Then the highest slot number, and the highest port number of the range (also separated by a colon) are specified. The beginning and end of the port list range are separated by a dash. For example, 1:3 specifies slot number 1, port 3. 2:4 specifies slot number 2, port 4. 1:3-2:4 specifies all of the ports between slot 1, port 3 and slot 2, port 4 – in numerical order.
Restrictions	None.

Example usage:

To display the packets analysis for port 4:1:

```
DES6500:4#show packet ports 4:1
Command: show packet ports 4:1

Port number : 4:1
Frame Size  Frame Counts  Frames/sec  Frame Type  Total
Total/sec
-----
64          0          0          RX Bytes    0          0
65-127      0          0          RX Frames   0          0
128-255     0          0
256-511     0          0          TX Bytes    0          0
512-1023    0          0          TX Frames   0          0
1024-1518   0          0

Unicast RX  0          0
Multicast RX 0          0
Broadcast RX 0          0
L3Unicast RX 0          0
L3Unicast TX 0          0

DES-6500:4#
```

show error ports

Purpose	Used to display the error statistics for a range of ports.
Syntax	show error ports <portlist>
Description	This command will display all of the packet error statistics collected and logged by the switch for a given port list.
Parameters	<portlist> – Specifies a range of ports to be displayed. The port list is specified by listing the lowest slot number and the beginning port number on that slot, separated by a colon. Then the highest slot number, and the highest port number of the range (also separated by a colon) are specified. The beginning and end of the port list range are separated by a dash. For example, 1:3 specifies slot number 1, port 3. 2:4 specifies slot number 2, port 4. 1:3-2:4 specifies all of the ports between slot 1, port 3 and slot 2, port 4 – in numerical order.
Restrictions	None.

Example usage:

To display the errors of the port 3 of module 1:

DES-6500:4#show errors port 1:3			
RX Frames		TX Frames	
-----		-----	
CRC Error	0	Excessive Deferral	0
Undersize	0	CRC Error	0
Oversize	0	Late Collision	0
Fragment	0	Excessive Collision	0
Jabber	0	Single Collision	0
Drop Pkts	0	Collision	0

show utilization

Purpose	Used to display real-time port utilization statistics.
Syntax	show utilization
Description	This command will display the real-time port utilization statistics for the switch.
Parameters	None.
Restrictions	None.

Example usage:

To display the port utilization statistics:

DES-6500:4#show utilization							
Port	TX sec	RX sec	Util	Port	TX sec	RX sec	Util
----	-----	-----	----	----	-----	-----	----
1:1	0	0	0	2:10	0	0	0
1:2	0	0	0	2:11	0	0	0
1:3	0	0	0	2:12	0	0	0
1:4	0	0	0	2:12	0	0	0
1:5	0	0	0				
1:6	0	0	0				
1:7	0	0	0				
1:8	0	0	0				
1:9	0	0	0				
1:10	0	0	0				
1:11	0	0	0				
1:12	0	0	0				
2:1	0	0	0				
2:2	0	0	0				
2:3	0	0	0				
2:4	0	0	0				
2:5	0	0	0				
2:6	0	0	0				
2:7	0	0	0				
2:8	0	0	0				
2:9	0	0	0				

clear counters

Purpose	Used to clear the switch's statistics counters.
Syntax	clear counters {ports <portlist>}
Description	This command will clear the counters used by the switch to compile statistics.
Parameters	<portlist> – Specifies a range of ports to be configured. The port list is specified by listing the lowest slot number and the beginning port number on that slot, separated by a colon. Then the highest slot number, and the highest port number of the range (also separated by a colon) are specified. The beginning and end of the port list range are separated by a dash. For example, 1:3 specifies slot number 1, port 3. 2:4 specifies slot number 2, port 4. 1:3-2:4 specifies all of the ports between slot 1, port 3 and slot 2, port 4 – in numerical order.
Restrictions	Only administrator-level users can issue this command.

Example usage:

To clear the counters:

```
DES-6500:4#clear counters ports 7:2
```

```
Command: clear counters ports 7:9
```

```
Success.
```

clear log

Purpose	Used to clear the switch's history log.
Syntax	clear log
Description	This command will clear the switch's history log.
Parameters	None.
Restrictions	Only administrator-level users can issue this command.

Example usage:

To clear the log information:

```
DES-6500:4#clear log
```

```
Command: clear log
```

```
Success.
```

```
DES-6500:4#
```

show log

Purpose	Used to display the switch history log.
Syntax	show log {index <value_list>}
Description	This command will display the contents of the switch's history log.
Parameters	index <value_list> – The show log command will display the history log until the log number reaches the value specified by the value_list entry.
Restrictions	None.

Example usage:

To display the switch history log:

```

DES-6500:4#show log
Index Time      Log Text
-----
4  000d00h50m Unit 1, Successful login through Console
  (Username: Anonymous)
3  000d00h50m Unit 1, Logout through Console (Username:
  Anonymous)
2  000d00h49m Unit 1, Successful login through Console
  (Username: Anonymous)
1  000d00h49m Unit 1, Logout through Console (Username:
  Anonymous)

DES-6500:4#

```

enable syslog

Purpose	Used to enable the system log to be sent to a remote host.
Syntax	enable syslog
Description	The enable syslog command enables the system log to be sent to a remote host.
Parameters	None.
Restrictions	Only administrator-level users can issue this command.

Example usage:

To the syslog function on the switch:

```

DES-6500:4#enable syslog
Command: enable syslog

Success.

DES-6500:4#

```

disable syslog

Purpose	Used to enable the system log to be sent to a remote host.
Syntax	disable syslog
Description	The disable syslog command enables the system log to be sent to a remote host.

disable syslog

Parameters	None.
Restrictions	Only administrator-level users can issue this command.

Example usage:

To disable the syslog function on the switch:

```
DES-6500:4#disable syslog
```

```
Command: disable syslog
```

```
Success.
```

```
DES-6500:4#
```

show syslog

Purpose	Used to display the syslog protocol status as enabled or disabled.
Syntax	show syslog
Description	The show syslog command displays the syslog status as enabled or disabled.
Parameters	None.
Restrictions	None.

Example usage:

To display the current status of the syslog function:

```
DES-6500:4#show syslog
```

```
Command: show syslog
```

```
Syslog Global State: Enabled
```

```
DES-6500:4#
```

create syslog host

Purpose	Used to create a new syslog host.																								
Syntax	create syslog host [<index 1-4>] { severity [informational warning all] facility [local0 local1 local2 local3 local4 local5 local6 local7] udp_port <udp_port_number> ipaddress <ipaddr> state [enabled disabled] }																								
Description	The create syslog host command is used to create a new syslog host.																								
Parameters	<index 1-4> – Specifies that the command will be applied to an index of hosts. There are four available indexes, numbered 1 through 4. severity – Severity level indicator. These are described in the following: Bold font indicates that the corresponding severity level is currently supported on the switch. <table><thead><tr><th>Numerical Code</th><th>Severity</th></tr></thead><tbody><tr><td>0</td><td>Emergency: system is unusable</td></tr><tr><td>1</td><td>Alert: action must be taken immediately</td></tr><tr><td>2</td><td>Critical: critical conditions</td></tr><tr><td>3</td><td>Error: error conditions</td></tr><tr><td>4</td><td>Warning: warning conditions</td></tr><tr><td>5</td><td>Notice: normal but significant condition</td></tr><tr><td>6</td><td>Informational: informational messages</td></tr><tr><td>7</td><td>Debug: debug-level messages</td></tr></tbody></table> informational – Specifies that informational messages will be sent to the remote host. This corresponds to number 6 from the list above. warning – Specifies that warning messages will be sent to the remote host. This corresponds to number 4 from the list above. all – Specifies that all of the currently supported syslog messages that are generated by the switch will be sent to the remote host. facility – Some of the operating system daemons and processes have been assigned Facility values. Processes and daemons that have not been explicitly assigned a Facility may use any of the "local use" facilities or they may use the "user-level" Facility. Those Facilities that have been designated are shown in the following: Bold font indicates the facility values that the switch currently supports. <table><thead><tr><th>Numerical Code</th><th>Facility</th></tr></thead><tbody><tr><td>0</td><td>kernel messages</td></tr><tr><td>1</td><td>user-level messages</td></tr></tbody></table>	Numerical Code	Severity	0	Emergency: system is unusable	1	Alert: action must be taken immediately	2	Critical: critical conditions	3	Error: error conditions	4	Warning: warning conditions	5	Notice: normal but significant condition	6	Informational: informational messages	7	Debug: debug-level messages	Numerical Code	Facility	0	kernel messages	1	user-level messages
Numerical Code	Severity																								
0	Emergency: system is unusable																								
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Numerical Code	Facility																								
0	kernel messages																								
1	user-level messages																								

create syslog host

2	mail system
3	system daemons
4	security authorization messages
5	messages generated internally by syslog
6	line printer subsystem
7	network news subsystem
8	UUCP subsystem
9	clock daemon
10	security authorization messages
11	FTP daemon
12	NTP subsystem
13	log audit
14	log alert
15	clock daemon
16	local use 0 (local0)
17	local use 1 (local1)
18	local use 2 (local2)
19	local use 3 (local3)
20	local use 4 (local4)
21	local use 5 (local5)
22	local use 6 (local6)
23	local use 7 (local7)

local0 – Specifies that local use 0 messages will be sent to the remote host. This corresponds to number 16 from the list above.

local1 – Specifies that local use 1 messages will be sent to the remote host. This corresponds to number 17 from the list above.

local2 – Specifies that local use 2 messages will be sent to the remote host. This corresponds to number 18 from the list above.

local3 – Specifies that local use 3 messages will be sent to the remote host. This corresponds to number 19 from the list above.

local4 – Specifies that local use 4 messages will be sent to the remote

create syslog host

host. This corresponds to number 20 from the list above.

local5 – Specifies that local use 5 messages will be sent to the remote host. This corresponds to number 21 from the list above.

local6 – Specifies that local use 6 messages will be sent to the remote host. This corresponds to number 22 from the list above.

local7 – Specifies that local use 7 messages will be sent to the remote host. This corresponds to number 23 from the list above.

udp_port <udp_port_number> – Specifies the UDP port number that the syslog protocol will use to send messages to the remote host.

ipaddress <ipaddr> – Specifies the IP address of the remote host where syslog messages will be sent.

state [enabled|disabled] – Allows the sending of syslog messages to the remote host, specified above, to be enabled and disabled.

Restrictions

Only administrator-level users can issue this command.

Example usage:

To create syslog host:

```
DES-6500:4#create syslog host 1 severity all facility local0
Command: create syslog host 1 severity all facility local0
Success.
DES-6500:4#
```

config syslog host

Purpose	Used to configure the syslog protocol to send system log data to a remote host.		
Syntax	config syslog host [all <index 1-4>] {severity [informational warning all]} facility[local0 local1 local2 local3 local4 local5 local6 local7][udp_port <udp_port_number> ipaddress <ipaddr> state[enabled disabled]		
Description	The config syslog host command is used to configure the syslog protocol to send system log information to a remote host.		
Parameters	<p>all – Specifies that the command will be applied to all hosts.</p> <p><index 1-4> – Specifies that the command will be applied to an index of hosts. There are four available indexes, numbered 1 through 4.</p> <p>severity – Severity level indicator. These are described in the following: Bold font indicates that the corresponding severity level is currently supported on the switch.</p> <table><thead><tr><th>Numerical</th><th>Severity</th></tr></thead></table>	Numerical	Severity
Numerical	Severity		

config syslog host

Code

- 0 Emergency: system is unusable
- 1 Alert: action must be taken immediately
- 2 Critical: critical conditions
- 3 Error: error conditions
- 4 Warning: warning conditions**
- 5 Notice: normal but significant condition
- 6 Informational: informational messages**
- 7 Debug: debug-level messages

informational – Specifies that informational messages will be sent to the remote host. This corresponds to number 6 from the list above.

warning – Specifies that warning messages will be sent to the remote host. This corresponds to number 4 from the list above.

all – Specifies that all of the currently supported syslog messages that are generated by the switch will be sent to the remote host.

facility – Some of the operating system daemons and processes have been assigned Facility values. Processes and daemons that have not been explicitly assigned a Facility may use any of the "local use" facilities or they may use the "user-level" Facility. Those Facilities that have been designated are shown in the following: Bold font indicates that the facility values the switch currently supports.

Numerical Facility

Code

- 0 kernel messages
- 1 user-level messages
- 2 mail system
- 3 system daemons
- 4 security|authorization messages
- 5 messages generated internally by syslog
- 6 line printer subsystem
- 7 network news subsystem
- 8 UUCP subsystem
- 9 clock daemon
- 10 security|authorization messages
- 11 FTP daemon
- 12 NTP subsystem
- 13 log audit
- 14 log alert
- 15 clock daemon
- 16 local use 0 (local0)**
- 17 local use 1 (local1)**
- 18 local use 2 (local2)**
- 19 local use 3 (local3)**
- 20 local use 4 (local4)**

config syslog host

21 local use 5 (local5)

22 local use 6 (local6)

23 local use 7 (local7)

local0 – Specifies that local use 0 messages will be sent to the remote host. This corresponds to number 16 from the list above.

local1 – Specifies that local use 1 messages will be sent to the remote host. This corresponds to number 17 from the list above.

local2 – Specifies that local use 2 messages will be sent to the remote host. This corresponds to number 18 from the list above.

local3 – Specifies that local use 3 messages will be sent to the remote host. This corresponds to number 19 from the list above.

local4 – Specifies that local use 4 messages will be sent to the remote host. This corresponds to number 20 from the list above.

local5 – Specifies that local use 5 messages will be sent to the remote host. This corresponds to number 21 from the list above.

local6 – Specifies that local use 6 messages will be sent to the remote host. This corresponds to number 22 from the list above.

local7 – Specifies that local use 7 messages will be sent to the remote host. This corresponds to number 23 from the list above.

udp_port <udp_port_number> – Specifies the UDP port number that the syslog protocol will use to send messages to the remote host.

ipaddress <ipaddr> – Specifies the IP address of the remote host where syslog messages will be sent.

state [enabled|disabled] – Allows the sending of syslog messages to the remote host, specified above, to be enabled and disabled.

Restrictions

Only administrator-level users can issue this command.

Example usage:

To configure a syslog host:

```
DES-6500:4#config syslog host all severity all facility local0
Command: config syslog host all severity all facility local0
Success.
DES-6500:4#
```

delete syslog host

Purpose Used to remove a syslog host, that has been previously configured, from the switch.

Syntax **delete syslog host [<index 1-4>|all]**

Description The **delete syslog host** command is used to remove a syslog host that has been previously configured from the switch.

delete syslog host

Parameters	<index 1-4> – Specifies that the command will be applied to an index of hosts. There are four available indexes, numbered 1 through 4. all – Specifies that the command will be applied to all hosts.
Restrictions	Only administrator-level users can issue this command.

Example usage:

To delete a previously configured syslog host:

```
DES-6500:4#delete syslog host 4
Command: delete syslog host 4

Success.

DES-6500:4#
```

show syslog host

Purpose	Used to display the syslog hosts currently configured on the switch.
Syntax	show syslog host {<index 1-4>}
Description	The show syslog host command is used to display the syslog hosts that are currently configured on the switch.
Parameters	<index 1-4> – Specifies that the command will be applied to an index of hosts. There are four available indexes, numbered 1 through 4.
Restrictions	None.

Example usage:

To show Syslog host information:

```
DES-6500:4#show syslog host
Command: show syslog host
Syslog Global State: Disabled
Host Id  Host IP Address  Severity  Facility  UDP port  Status
-----  -
1        10.1.1.2         All       Local0    514       Disabled
2        10.40.2.3        All       Local0    514       Disabled
3        10.21.13.1       All       Local0    514       Disabled

Total Entries : 3
```

DES-6500:4#

show stack_information

Purpose	Used to display the stack information table.
Syntax	show stack_information
Description	This command display stack information.
Parameters	None.
Restrictions	None.

Usage Example:

To display stack information:

```
DES-6500:4#show stack_information
Command: show stack_information

Box
ID      Type          Exist  Prio- Prom   Runtime H/W
-----  -----  ----  rity  version version version
1       DES-6507      exist  16   0.00-B14 0.00-B14 1A1
2       USR-NOT-CFG  no
3       USR-NOT-CFG  no
4       USR-NOT-CFG  no
5       USR-NOT-CFG  no
6       USR-NOT-CFG  no
7       USR-NOT-CFG  no
8       USR-NOT-CFG  no

-----
Topology   :STAR
Current state :MASTER
Box Count   :1

DES-6500:4#
```

SPANNING TREE COMMANDS

The switch supports 802.1d STP and 802.1w Rapid STP. The spanning tree commands in the Command Line Interface (CLI) are listed (along with the appropriate parameters) in the following table.

Command	Parameters
config stp	maxage <value 6-40> hellotime <value 1-10> forwarddelay <value 4-30> priority <value 0-61440> fdpdu [enable disable] txholdcount <1-10> version [rstp stp]
config stp ports	<portlist> cost [auto <value 1-200000000>] priority <value 0-240> migrate [yes no] edge [true false] p2p [true false auto] state [enable disable]
enable stp	
disable stp	
show stp	
show stp ports	<portlist>

Each command is listed, in detail, in the following sections.

config stp

Purpose	Used to setup STP and RSTP on the switch.
Syntax	config stp {maxage <value 6-40> hellotime <value 1-10> forwarddelay <value 4-30> priority <value 0-61440> fbpdu [enabled disabled]} txholdcount <1-10> version[rstp stp]}
Description	This command is used to setup the Spanning Tree Protocol (STP) for the entire switch.
Parameters	<p>maxage <value 6-40> – The maximum amount of time (in seconds) that the switch will wait to receive a BPDU packet before reconfiguring STP. The user may choose a time between 6 and 40 seconds. The default is 20 seconds.</p> <p>hellotime <value 1-10> – The time interval between transmission of configuration messages by the root device. The user may choose a time between 1 and 10 seconds. The default is 2 seconds.</p> <p>forwarddelay <value 4-30> – The maximum amount of time (in seconds)</p>

config stp

that the root device will wait before changing states. The user may choose a time between 4 and 30 seconds. The default is 15 seconds.

priority <value 1-61440> – A numerical value between 0 and 61440 that is used in determining the root device, root port, and designated port. The device with the highest priority becomes the root device. The lower the numerical value, the higher the priority. The default is 32,768.

fbpdu [enabled|disabled] – Allows the forwarding of STP BPDU packets from other network devices when STP is disabled on the switch. The default is enabled.

txholdcount <1-10> - the maximum number of Hello packets transmitted per interval. Default value = 3.

version [rstp|stp] - select the Spanning Tree Protocol version used for the switch. For IEEE 802.1d STP select stp. Select rstp for IEEE 802.1w Rapid STP.

Restrictions

Only administrator-level users can issue this command.

Example usage:

To configure STP with maxage 18 and hellotime 4:

```
DES-6500:4#config stp maxage 18 hellotime 4
```

```
Command: config stp maxage 18 hellotime 4
```

```
Success.
```

```
DES-6500:4#
```

config stp ports

Purpose

Used to setup STP on the port level.

Syntax

```
config stp ports <portlist> {cost [auto|<value 1-200000000>]}|priority <value 0-240>| migrate [yes|no]| edge [true|false]| p2p [true|false]| state [enabled|disabled]
```

Description

This command is used to create and configure STP for a group of ports.

Parameters

cost<value 1-200000000> – This defines a metric that indicates the relative cost of forwarding packets to the specified port list. Port cost can be set from 1 to 200000000. The lower the number, the greater the probability the port will be chosen to forward packets.

Default port cost: 100Mbps port = 200000 Gigabit port = 20000

priority <value 0-240> – Port Priority can be from 0 to 240. The lower the number, the greater the probability the port will be chosen as the

config stp ports

Root Port. Default = 128.

<portlist> – Specifies a range of ports to be configured. The port list is specified by listing the lowest slot number and the beginning port number on that slot, separated by a colon. Then the highest slot number, and the highest port number of the range (also separated by a colon) are specified. The beginning and end of the port list range are separated by a dash. For example, 1:3 specifies slot number 1, port 3. 2:4 specifies slot number 2, port 4. 1:3-2:4 specifies all of the ports between slot 1, port 3 and slot 2, port 4 – in numerical order.

migrate [yes|no] – yes will enable the port to migrate from 802.1d STP status to 802.1w RSTP status. RSTP can coexist with standard STP, however the benefits of RSTP are not realized on a port where an 802.1d network connects to an 802.1w enabled network. Migration should be enabled (yes) on ports connected to network stations or segments that will be upgraded to 802.1w RSTP on all or some portion of the segment.

edge [true|false] – true designates the port as an edge port. Edge ports cannot create loops, however an edge port can lose edge port status if a topology change creates a potential for a loop. An edge port normally should not receive BPDU packets. If a BPDU packet is received it automatically loses edge port status. False indicates that the port does not have edge port status.

p2p [true|false|auto] – true indicates a point-to-point (P2P) shared link. P2P ports are similar to edge ports however they are restricted in that a P2P port must operate in full-duplex. Like edge ports, P2P ports transition to a forwarding state rapidly thus benefiting from RSTP. A p2p value of false indicates that the port cannot have p2p status. *Auto* allows the port to have p2p status whenever possible and operate as if the p2p status were *true*. If the port cannot maintain this status (for example if the port is forced to half-duplex operation) the p2p status changes to operate as if the p2p value were *false*.

state [enabled|disabled] – Allows STP to be enabled or disabled for the ports specified in the port list. The default is disabled.

Restrictions

Only administrator-level users can issue this command.

Example usage:

To configure STP with path cost 19, priority 15, and state enabled for ports 1-5 of module 1.

```
DES-6500:4#config stp ports 1:1-1:5 cost 19 priority 15 state enabled
```

```
Command: config stp ports 1-5 cost 19 priority 15 state enabled
```

```
Success.
```

```
DES-6500:4#
```


enable stp

Purpose	Used to globally enable STP on the switch.
Syntax	enable stp
Description	This command allows the Spanning Tree Protocol to be globally enabled on the switch.
Parameters	None.
Restrictions	Only administrator-level users can issue this command.

Example usage:

To enable STP, globally, on the switch:

```
DES-6500:4#enable stp
```

```
Command: enable stp
```

```
Success.
```

```
DES-6500:4#
```

disable stp

Purpose	Used to globally disable STP on the switch.
Syntax	disable stp
Description	This command allows the Spanning Tree Protocol to be globally disabled on the switch.
Parameters	None.
Restrictions	Only administrator-level users can issue this command.

Example usage:

To disable STP on the switch:

```
DES-6500:4#disable stp
```

```
Command: disable stp
```

```
Success.
```

```
DES-6500:4#
```

show stp

Purpose	Used to display the switch's current STP configuration.
Syntax	show stp
Description	This command displays the switch's current STP configuration.
Parameters	none
Restrictions	None.

Example usage:

To display the status of STP on the switch:

Status 1: STP enabled with STP compatible version

```
DES-6500:4#show stp
Command: show stp

STP Status           : Enabled
Max Age              : 20
Hello Time           : 2
Forward Delay        : 15
Priority              : 32768
Default Path Cost    : 802.1T
STP Version          : STP compatible
TX Hold Count        : 3
Forwarding BPDU      : Enabled

Designated Root Bridge : 00-00-51-43-70-00
Root Priority          : 32768
Cost to Root          : 200000
Root Port             : 10
Last Topology Change  : 53sec
Topology Changes Count : 1
Protocol Specification : 3
Max Age               : 20
Hello Time            : 2
Forward Delay         : 15
Hold Time             : 3

DES-6500:4#
```

Status 2 : STP disabled

```

DES-6500:4#show stp
Command: show stp

STP Status           : Disabled
Max Age              : 20
Hello Time           : 2
Forward Delay        : 15
Priority              : 32768
Default Path Cost    : 802.1T
STP Version          : STP compatible
TX Hold Count        : 3
Forwarding BPDU      : Enabled

DES-6500:4#

```

show stp ports

Purpose	Used to display the switch's current per-port group STP configuration.
Syntax	show stp ports <portlist>
Description	This command displays the switch's current per-port group STP configuration.
Parameters	<portlist> – Specifies a range of ports to be configured. The port list is specified by listing the lowest slot number and the beginning port number on that slot, separated by a colon. Then the highest slot number, and the highest port number of the range (also separated by a colon) are specified. The beginning and end of the port list range are separated by a dash. For example, 1:3 specifies slot number 1, port 3. 2:4 specifies slot number 2, port 4. 1:3-2:4 specifies all of the ports between slot 1, port 3 and slot 2, port 4 – in numerical order.
Restrictions	None

Example usage:

To display STP state of port 1-9 of module 1:

DES-6500:4#show stp ports

Command: show ports

Port	Designated	Bridge	State	Cost	Pri	Edge	P2P	Status	Role
1:1	N/A		Yes	*200000	128	No	Yes	Disabled	Disabled
1:2	N/A		Yes	*200000	128	No	Yes	Disabled	Disabled
1:3	N/A		Yes	*200000	128	No	Yes	Disabled	Disabled
1:4	N/A		Yes	*200000	128	No	Yes	Disabled	Disabled
1:5	N/A		Yes	*200000	128	No	Yes	Disabled	Disabled
1:6	N/A		Yes	*200000	128	No	Yes	Disabled	Disabled
1:7	N/A		Yes	*200000	128	No	Yes	Disabled	Disabled
1:8	N/A		Yes	*200000	128	No	Yes	Disabled	Disabled
1:9	N/A		Yes	*200000	128	No	Yes	Disabled	Disabled
1:10	N/A		Yes	*200000	128	No	Yes	Forwarding	NonStp
1:11	N/A		Yes	*200000	128	No	Yes	Disabled	Disabled
1:12	N/A		Yes	*200000	128	No	Yes	Disabled	Disabled
1:13	N/A		Yes	*200000	128	No	Yes	Disabled	Disabled
1:14	N/A		Yes	*200000	128	No	Yes	Disabled	Disabled
1:15	N/A		Yes	*200000	128	No	Yes	Disabled	Disabled
1:16	N/A		Yes	*200000	128	No	Yes	Disabled	Disabled

DES-6500:4#

FORWARDING DATABASE COMMANDS

The layer 2 forwarding database commands in the Command Line Interface (CLI) are listed (along with the appropriate parameters) in the following table.

Command	Parameters
create fdb	<vlan_name 32> <macaddr> port <port>
create multicast_fdb	<vlan_name 32> <macaddr>
config multicast_fdb	<vlan_name 32> <macaddr> [add delete] <portlist>
config fdb aging_time	<sec 10-1000000>
delete fdb	<vlan_name 32> <macaddr>
clear fdb	vlan <vlan_name 32> port <port> all
show multicast_fdb	vlan <vlan_name 32> mac_address <macaddr>
show fdb	port <port> vlan <vlan_name 32> mac_address <macaddr> static aging_time

Each command is listed, in detail, in the following sections.

create fdb

Purpose	Used to create a static entry to the unicast MAC address forwarding table (database)
Syntax	create fdb <vlan_name 32> <macaddr> [port <port>]
Description	This command will make an entry into the switch's unicast MAC address forwarding database.
Parameters	<p><vlan_name 32> – The name of the VLAN on which the MAC address resides.</p> <p><macaddr> – The MAC address that will be added to the forwarding table.</p> <p><port> – The port number corresponding to the MAC destination address. The switch will always forward traffic to the specified device through this port. The port list is specified by listing the lowest slot</p>

create fdb

number and the beginning port number on that slot, separated by a colon. Then the highest slot number, and the highest port number of the range (also separated by a colon) are specified. The beginning and end of the port list range are separated by a dash. For example, 1:3 specifies slot number 1, port 3. 2:4 specifies slot number 2, port 4. 1:3-2:4 specifies all of the ports between slot 1, port 3 and slot 2, port 4 – in numerical order.

Restrictions

Only administrator-level users can issue this command.

Example usage:

To create a unicast MAC FDB entry:

```
DES-6500:4#create fdb default 00-00-00-00-01-02 port 2:5
```

```
Command: create fdb default 00-00-00-00-01-02 port 2:5
```

```
Success.
```

```
DES-6500:4#
```

create multicast_fdb

Purpose

Used to create a static entry to the multicast MAC address forwarding table (database)

Syntax

```
create multicast_fdb <vlan_name 32> <macaddr>
```

Description

This command will make an entry into the switch's multicast MAC address forwarding database.

Parameters

<vlan_name 32> – The name of the VLAN on which the MAC address resides.

<macaddr> – The MAC address that will be added to the forwarding table.

Restrictions

Only administrator-level users can issue this command.

Example usage:

To create multicast MAC forwarding:

```
DES6500:4#create multicast_fdb default 01-00-23-11-11-11
```

```
Command: create multicast_fdb default 01-00-23-11-11-11
```

```
Success.
```

```
DES-6500:4#
```

config multicast_fdb

Purpose	Used to configure the switch's multicast MAC address forwarding database.
Syntax	config multicast_fdb <vlan_name 32> <macaddr> [add delete] <portlist>
Description	This command configures the multicast MAC address forwarding table.
Parameters	<p><vlan_name 32> – The name of the VLAN on which the MAC address resides.</p> <p><macaddr> – The MAC address that will be added to the forwarding table.</p> <p>[add delete] – Add will add the MAC address to the forwarding table. Delete will remove the MAC address from the forwarding table.</p> <p><portlist> – Specifies a range of ports to be configured. The port list is specified by listing the lowest slot number and the beginning port number on that slot, separated by a colon. Then the highest slot number, and the highest port number of the range (also separated by a colon) are specified. The beginning and end of the port list range are separated by a dash. For example, 1:3 specifies slot number 1, port 3. 2:4 specifies slot number 2, port 4. 1:3-2:4 specifies all of the ports between slot 1, port 3 and slot 2, port 4 – in numerical order.</p>
Restrictions	Only administrator-level users can issue this command.

Example usage:

To add multicast MAC forwarding:

```
DES6500:4#config multicast_fdb default 01-00-23-11-11-11
add 4:1-4:4
Command: config multicast_fdb default 01-00-23-11-11-11 add
4:1-4:4

Success.

DES-6500:4#
```

config fdb aging_time

Purpose	Used to set the aging time of the forwarding database.
Syntax	config fdb aging_time <sec 10-1000000>
Description	The aging time affects the learning process of the switch. Dynamic forwarding table entries, which are made up of the source MAC addresses and their associated port numbers, are deleted from the table if they are not accessed within the aging time. The aging time can be from 10 to 1000000 seconds with a default value of 300 seconds. A very long aging time can result in dynamic forwarding table entries that are out-of-date or no longer exist. This may cause incorrect packet forwarding decisions by the switch. If the aging time is too short however, many entries may be aged out too soon. This will result in a high percentage of received packets whose source addresses cannot be found in the forwarding table, in which case the switch will broadcast the packet to all ports, negating many of the benefits of having a switch.
Parameters	<sec 10-1000000> – The aging time for the MAC address forwarding database.
Restrictions	Only administrator-level users can issue this command.

Example usage:

To set the fdb aging time:

```
DES-6500:4#config fdb aging_time 300
```

```
Command: config fdb aging_time 300
```

```
Success.
```

```
DES-6500:4#
```

delete fdb

Purpose	Used to delete an entry to the switch's forwarding database.
Syntax	delete fdb <vlan_name 32> <macaddr>
Description	This command is used to delete a previous entry to the switch's MAC address forwarding database.
Parameters	<vlan_name 32> – The name of the VLAN on which the MAC address resides. <macaddr> – The MAC address that will be added to the forwarding table.
Restrictions	Only administrator-level users can issue this command.

Example usage:

To delete a permanent FDB entry:

```
DES-6500:4#delete fdb default 00-00-00-00-01-02
```

```
Command: delete fdb default 00-00-00-00-01-02
```

```
Success.
```

```
DES-6500:4#
```

clear fdb

Purpose	Used to clear the switch's forwarding database of all dynamically learned MAC addresses.
Syntax	clear fdb [vlan <vlan_name 32> port <port> all]
Description	This command is used to clear dynamically learned entries to the switch's forwarding database.
Parameters	<p><vlan_name 32> – The name of the VLAN on which the MAC address resides.</p> <p><port> – The port number corresponding to the MAC destination address. The switch will always forward traffic to the specified device through this port. The port list is specified by listing the lowest slot number and the beginning port number on that slot, separated by a colon. Then the highest slot number, and the highest port number of the range (also separated by a colon) are specified. The beginning and end of the port list range are separated by a dash. For example, 1:3 specifies slot number 1, port 3. 2:4 specifies slot number 2, port 4. 1:3-2:4 specifies all of the ports between slot 1, port 3 and slot 2, port 4 – in numerical order.</p> <p>all – Clears all dynamic entries to the switch's forwarding database.</p>
Restrictions	Only administrator-level users can issue this command.

Example usage:

To clear all FDB dynamic entries:

```
DES-6500:4#clear fdb all
```

```
Command: clear fdb all
```

```
Success.
```

```
DES-6500:4#
```

show multicast_fdb

Purpose	Used to display the contents of the switch's multicast forwarding database.
Syntax	show mulitcast_fdb [vlan <vlan_name 32> mac_address <macaddr>]
Description	This command is used to display the current contents of the switch's multicast MAC address forwarding database.
Parameters	<vlan_name 32> – The name of the VLAN on which the MAC address resides. <macaddr> – The MAC address that will be added to the forwarding table.
Restrictions	None.

Example usage:

To display multicast MAC address table:

```
DES-6500:4#show multicast_fdb
Command: show multicast_fdb

VLAN Name      : default
MAC Address    : 01-00-5E-00-00-00
Egress Ports   : 1:1-1:5,1:26,2:26
Mode           : Static

Total Entries  : 1
```

show fdb

Purpose	Used to display the current unicast MAC address forwarding database.
Syntax	show fdb {port <port> vlan <vlan_name 32> mac_address <macaddr> static aging_time}
Description	This command will display the current contents of the switch's forwarding database.
Parameters	<port> – The port number corresponding to the MAC destination address. The switch will always forward traffic to the specified device through this port. The port list is specified by listing the lowest slot number and the beginning port number on that slot, separated by a colon. Then the highest slot number, and the highest port number of the range (also separated by a colon) are specified. The beginning and end of the port list range are seperated by a dash. For example, 1:3 specifies slot number 1, port 3. 2:4 specifies slot number 2, port 4. 1:3-

show fdb

2:4 specifies all of the ports between slot 1, port 3 and slot 2, port 4 – in numerical order.

<vlan_name 32> – The name of the VLAN on which the MAC address resides.

<macaddr> – The MAC address that will be added to the forwarding table.

static – Displays the static MAC address entries.

aging_time – Displays the aging time for the MAC address forwarding database.

Restrictions

None.

Example usage:

To display unicast MAC address table:

DES-6500:4#show fdb

Command: show fdb

Unicast MAC Address Ageing Time = 300

VID	VLAN Name	MAC Address	Port	Type
1	default	00-00-39-34-66-9A	10	Dynamic
1	default	00-00-51-43-70-00	10	Dynamic
1	default	00-00-5E-00-01-01	10	Dynamic
1	default	00-00-74-60-72-2D	10	Dynamic
1	default	00-00-81-05-00-80	10	Dynamic
1	default	00-00-81-05-02-00	10	Dynamic
1	default	00-00-81-48-70-01	10	Dynamic
1	default	00-00-E2-4F-57-03	10	Dynamic
1	default	00-00-E2-61-53-18	10	Dynamic
1	default	00-00-E2-6B-BC-F6	10	Dynamic
1	default	00-00-E2-7F-6B-53	10	Dynamic
1	default	00-00-E2-82-7D-90	10	Dynamic
1	default	00-00-F8-7C-1C-29	10	Dynamic
1	default	00-01-02-03-04-00	CPU	Self
1	default	00-01-02-03-04-05	10	Dynamic
1	default	00-01-30-10-2C-C7	10	Dynamic
1	default	00-01-30-FA-5F-00	10	Dynamic
1	default	00-02-3F-63-DD-68	10	Dynamic



BROADCAST STORM CONTROL COMMANDS

The broadcast storm control commands in the Command Line Interface (CLI) are listed (along with the appropriate parameters) in the following table.

Command	Parameters
config traffic control	<storm_grouplist> all broadcast [enable disable] multicast [enable disable] dlf [enable disable] threshold <value>
show traffic control	group_list <storm_grouplist>

Each command is listed, in detail, in the following sections.

config traffic control

Purpose	Used to configure broadcast multicast traffic control.
Syntax	config traffic control [<storm_grouplist> all] broadcast [enable disable] multicast [enable disable] dlf [enable disable] threshold <value>
Description	This command is used to configure broadcast storm control.
Parameters	<p><storm_grouplist> – Used to specify a broadcast storm control group with the syntax: module_id:group_id.</p> <p>all – Specifies all broadcast storm control groups on the switch.</p> <p>broadcast [enable disable] – Enables or disables broadcast storm control.</p> <p>multicast [enable disable] – Enables or disables multicast storm control.</p> <p>dlf [enable disable] – Enables or disables dlf traffic control.</p> <p>threshold <value> – The upper threshold at which the specified traffic control is switched on. The <value> is the number of broadcast multicast dlf packets, in Kbps, received by the switch that will trigger the storm traffic control measures.</p>
Restrictions	Only administrator-level users can issue this command.

Example usage:

To configure traffic control and enable broadcast storm control system wide:

DES-6500:4#config traffic control all broadcast enable
Command: config traffic control all broadcast enable

Success.

DES-6500:4#

show traffic control

Purpose	Used to display current traffic control settings.
Syntax	show traffic control {group_list <storm_grouplist>}
Description	This command displays the current storm traffic control configuration on the switch.
Parameters	group_list <storm_grouplist> – Used to specify a broadcast storm control group with the syntax: module_id:group_id.
Restrictions	None.

Example usage:

To display traffic control setting:

DES-6500:4#show traffic control
Command: show traffic control

Traffic Control

Module	Group	Threshold	Broadcast Storm	Multicast Storm	Destination Lookup Fail
1	1	128	Disabled	Disabled	Disabled
1	2	128	Disabled	Disabled	Disabled
1	3	128	Disabled	Disabled	Disabled
1	4	128	Disabled	Disabled	Disabled
1	5	128	Disabled	Disabled	Disabled

Total Entries: 5

DES-6500:4#

QoS COMMANDS

The DES-6500 switch supports 802.1p priority queuing. The switch has 8 priority queues. These priority queues are numbered from 0 (Class 0) — the lowest priority queue — to 6 (Class 6) — the highest priority queue. The eight priority queues specified in IEEE 802.1p (p0 to p7) are mapped to the switch's priority queues as follows:

- Priority 0 is assigned to the Switch's Q2 queue.
- Priority 1 is assigned to the Switch's Q0 queue.
- Priority 2 is assigned to the Switch's Q1 queue.
- Priority 3 is assigned to the Switch's Q3 queue.
- Priority 4 is assigned to the Switch's Q4 queue.
- Priority 5 is assigned to the Switch's Q5 queue.
- Priority 6 is assigned to the Switch's Q6 queue.
- Priority 7 is assigned to the Switch's Q6 queue.

Priority scheduling is implemented using two types of methods, strict priority and weight fair priority. If no changes are made to the QoS priority scheduling settings the method used is strict priority.

For strict priority-based scheduling, packets residing in the higher priority queues are transmitted first. Only when these queues are empty, are packets of lower priority allowed to be transmitted. Higher priority packets always receive preference regardless of the amount of lower priority packets in the buffer and regardless of the time elapsed since any lower priority packets have been transmitted. By default the switch is configured to empty the buffer using strict priority.



NOTICE: The default QoS scheduling arrangement is a strict priority schedule. To customize scheduling to set up weight fair queue clearing, the MAX. Packets values need to be changed using the config scheduling command. See **config scheduling** below.

To use implement weight fair priority, the switch's eight priority queues can be configured to reduce the buffer in a round-robin fashion - beginning with the highest priority queue, and proceeding to the lowest priority queue before returning to the highest priority queue.

The weighted-priority based scheduling alleviates the main disadvantage of strict priority-based scheduling – in that lower priority queues get starved of bandwidth – by providing a minimum bandwidth to all queues for transmission. This is accomplished by configuring the maximum number of packets allowed to be transmitted from a given priority queue and the maximum amount of time a given priority queue will have to wait before being allowed to transmit its accumulated packets. This establishes a Class of Service (CoS) for each of the switch's four hardware priority queues.

The possible range for maximum packets is: 0 to 15 packets.

The commands in the Command Line Interface (CLI) are listed (along with the appropriate parameters) in the following table.

Command	Parameters
config bandwidth_control	<portlist> rx_rate no_limit <value 1-999> tx_rate no_limit <value 1-999>
show bandwidth_control	<portlist>
config scheduling	<class_id 0-6> max_packet <value 0-15>
show scheduling	

Command	Parameters
config 802.1p user_priority	<priority 0-7> <class_id 0-6>
show 802.1p user_priority	
config 802.1p default_priority	<portlist> all <priority 0-7>
show 802.1p default_priority	<portlist>
config scheduling_mechanism	[strict weight_fair]
show scheduling_mechanism	
enable hol_prevention	
disable hol_prevention	
show hol_prevention	

Each command is listed, in detail, in the following sections.

config bandwidth_control

Purpose	Used to configure bandwidth control on a by-port basis.
Syntax	config bandwidth_control <portlist> {rx_rate [no_limit <value 1-999>] tx_rate [no_limit <value 1-999>]}
Description	The config bandwidth_control command is used to configure bandwidth on a by-port basis.
Parameters	<p><portlist> – Specifies a range of ports to be configured. The port list is specified by listing the lowest slot number and the beginning port number on that slot, separated by a colon. Then the highest slot number, and the highest port number of the range (also separated by a colon) are specified. The beginning and end of the port list range are separated by a dash. For example, 1:3 specifies slot number 1, port 3. 2:4 specifies slot number 2, port 4. 1:3-2:4 specifies all of the ports between slot 1, port 3 and slot 2, port 4 – in numerical order.</p> <p>rx_rate – Specifies that one of the parameters below (no_limit or <value 1-999>) will be applied to the rate at which the above specified ports will be allowed to receive packets</p> <p>no_limit – Specifies that there will be no limit on the rate of packets received by the above specified ports.</p> <p><value 1-999> – Specifies the packet limit, in Mbps, that the above ports will be allowed to receive.</p> <p>tx_rate – Specifies that one of the parameters below (no_limit or <value 1-999>) will be applied to the rate at which the above specified ports will be allowed to transmit packets.</p> <p>no_limit – Specifies that there will be no limit on the rate of packets received by the above specified ports.</p> <p><value 1-999> – Specifies the packet limit, in Mpps, that the above ports will be allowed to receive.</p>
Restrictions	Only administrator-level users can issue this command.

Example usage:

To configure bandwidth control:

```
DES-6500:4#config bandwidth_control 1-10 tx_rate 10
```

```
Command: config bandwidth_control 1-10 tx_rate 10
```

```
Success.
```

```
DES-6500:4#
```

show bandwidth_control

Purpose	Used to display the bandwidth control configuration on the switch.
Syntax	show bandwidth_control {<portlist>}
Description	The show bandwidth_control command displays the current bandwidth control configuration on the switch, on a port-by-port basis.
Parameters	<portlist> – Specifies a range of ports to be configured. The port list is specified by listing the lowest slot number and the beginning port number on that slot, separated by a colon. Then the highest slot number, and the highest port number of the range (also separated by a colon) are specified. The beginning and end of the port list range are separated by a dash. For example, 1:3 specifies slot number 1, port 3. 2:4 specifies slot number 2, port 4. 1:3-2:4 specifies all of the ports between slot 1, port 3 and slot 2, port 4 – in numerical order.
Restrictions	None.

Example usage:

To display bandwidth control settings:

DES-6500:4#show bandwidth_control 1-10

Command: show bandwidth_control 1-10

Bandwidth Control Table

Port RX Rate (Mbit|sec) TX_RATE (Mbit|sec)

Port	RX Rate (Mbit sec)	TX_RATE (Mbit sec)
1	no_limit	10
2	no_limit	10
3	no_limit	10
4	no_limit	10
5	no_limit	10
6	no_limit	10
7	no_limit	10
8	no_limit	10
9	no_limit	10
10	no_limit	10

DES-6500:4#

config scheduling

Purpose

Used to configure traffic scheduling for each of the switch's QoS queues.

Syntax

config scheduling <class_id 0-6> {max_packet <value 0-15>|

Description

The switch contains eight hardware priority queues per device. The switch's default settings draw down the seven hardware queues in order, from the highest priority (Class 6) to the lowest priority (Class 0). Starting with the highest priority queue (Class 6), the highest priority queue will transmit all of the packets and empty its buffer before allowing the next lower priority queue to transmit its packets. The next highest priority queue will empty before proceeding to the next queue and so on. Lower priority queues are allowed to transmit only if the higher priority queue(s) in the buffer are completely emptied. Packets in the higher priority queues are always emptied before any in the lower priority queues regardless of latency or volume of the lower priority queues.

The default settings for QoS scheduling employ this strict priority scheme to empty priority queues.

The **config scheduling** command can be used to specify the round robin rotation by which these four hardware priority queues are reduced. To use a round-robin scheme, the max_packets parameters and/or the max_latency parameters must be changed from the default value of 0.

The **max_packets** parameter allows you to specify the maximum

config scheduling

number of packets a given priority queue can transmit before allowing the next lowest priority queue to begin transmitting its packets. A value between 0 and 15 packets can be specified. For example, if a value of 5 is specified, then the highest priority queue (queue 3) will be allowed to transmit 5 packets. Then the next lower priority queue (queue 2) will be allowed to transmit 5 packets, and so on, until all of the queues have transmitted 5 packets. The process will then repeat.

Parameters

<class_id> – Specifies which of the four priority queues the **config scheduling** command will be applied to. The seven priority queues are identified by number – from 0 to 6 – with queue 6 being the highest priority.

max_packet <value 0-15> – Specifies the maximum number of packets the above specified priority queue will be allowed to transmit before allowing the next lowest priority queue to transmit its packets. A value between 0 and 15 packets can be specified. The default value is 0.

Restrictions

Only administrator-level users can issue this command.



NOTICE: The default QoS scheduling arrangement is a strict priority schedule. To customize scheduling to set up weighted or round-robin queue clearing the **max_latency** and **max_packets** values need to be changed.

Example usage:

To configure traffic scheduling:

```
DES-6500:4# config scheduling 0 max_packet 15
```

```
Command: config scheduling 0 max_packet 15
```

```
Success.
```

```
DES-6500:4#
```

show scheduling

Purpose

Used to display the currently configured traffic scheduling on the switch.

Syntax

show scheduling

Description

The **show scheduling** command displays the current configuration for the maximum number of packets (**max_packets**) assigned to the eight priority queues on the switch. At this value, it will empty the eight hardware queues in order, from the highest priority (queue 6) to the lowest priority (queue 0).

show scheduling

Parameters	None.
Restrictions	None.

Example usage:

To display the current scheduling configuration:

```
DES-6500:4# show scheduling
```

```
Command: show scheduling
```

QOS Output Scheduling

	MAX. Packets

Class-0	1
Class-1	2
Class-2	3
Class-3	4
Class-4	5
Class-5	6
Class-6	7

```
DES-6500:4#
```

config 802.1p user_priority

Purpose Used to map the 802.1p user priority of an incoming packet to one of the eight hardware queues available on the switch.

Syntax `config 802.1p user_priority <priority 0-7> <class_id 0-6>`

Description The `config 802.1p user_priority` command is used to configure the way the switch will map an incoming packet, based on its 802.1p user priority tag, to one of the eight hardware priority queues available on the switch. The switch's default is to map the incoming 802.1p priority values to the four hardware queues according to the following chart:

802.1p	Switch Priority	Remark
Value	Queue	
-----	-----	-----
0	2	

config 802.1p user_priority

1	0
2	1
3	3
4	4
5	5
6	6
7	6

Parameters	<p><priority 0-7> – Specifies which of the 8 802.1p priority values (0 through 7) you want to map to one of the switch's hardware priority queues (<class_id>, 0 through 6).</p> <p><class_id 0-6> – Specifies which of the switch's hardware priority queues the 802.1p priority value (specified above) will be mapped to.</p>
Restrictions	Only administrator-level users can issue this command.

Example usage:

To configure 802.1 user priority on the switch:

```
DES-6500:4# config 802.1p user_priority 1 3
Command: config 802.1p user_priority 1 3

Success.

DES-6500:4#
```

show 802.1p user_priority

Purpose	Used to display the current mapping between an incoming packet's 802.1p priority value and one of the switch's four hardware priority queues.
Syntax	show 802.1p user_priority
Description	The show 802.1p user_priority command displays the current mapping of an incoming packet's 802.1p priority value to one of the switch's eight hardware priority queues.
Parameters	None.
Restrictions	None.

Example usage:

To show 802.1p user priority:

```
DES-6500:4# show 802.1p user_priority
Command: show 802.1p user_priority

COS Class of Traffic

Priority-0 -> <Class-1>
Priority-1 -> <Class-0>
Priority-2 -> <Class-0>
Priority-3 -> <Class-2>
Priority-4 -> <Class-3>
Priority-5 -> <Class-4>
Priority-6 -> <Class-5>
Priority-7 -> <Class-6>

DES-6500:4#
```

config 802.1p default_priority

Purpose	Used to specify how to map an incoming packet that has no 802.1p priority tag to one of the switch's eight hardware priority queues.
Syntax	config 802.1p default_priority [<portlist> all] <priority 0-7>
Description	The config 802.1p default_priority command allows you to specify the 802.1p priority value an untagged, incoming packet will be assigned before being forwarded to its destination.
Parameters	<p><portlist> – Specifies a range of ports to be configured. The port list is specified by listing the lowest slot number and the beginning port number on that slot, separated by a colon. Then the highest slot number, and the highest port number of the range (also separated by a colon) are specified. The beginning and end of the port list range are separated by a dash. For example, 1:3 specifies slot number 1, port 3. 2:4 specifies slot number 2, port 4. 1:3-2:4 specifies all of the ports between slot 1, port 3 and slot 2, port 4 – in numerical order.</p> <p>all – Specifies that the config 802.1p default_priority command will be applied to all ports on the switch.</p> <p><priority 0-7> – Specifies the 802.1p priority value that an untagged, incoming packet will be given before being forwarded to its destination.</p>
Restrictions	Only administrator-level users can issue this command.

Example usage:

To configure 802.1p default priority on the switch:

```
DES-6500:4#config 802.1p default_priority all 5
Command: config 802.1p default_priority all 5

Success.

DES-6500:4#
```

show 802.1p default_priority	
Purpose	Used to display the currently configured 802.1p priority value that will be assigned to an incoming, untagged packet before being forwarded to its destination.
Syntax	show 802.1p default_priority {<portlist>}
Description	The show 802.1p default_priority command displays the currently configured 802.1p priority value that will be assigned to an incoming, untagged packet before being forwarded to its destination.
Parameters	<portlist> – Specifies a range of ports to be configured. The port list is specified by listing the lowest slot number and the beginning port number on that slot, separated by a colon. Then the highest slot number, and the highest port number of the range (also separated by a colon) are specified. The beginning and end of the port list range are separated by a dash. For example, 1:3 specifies slot number 1, port 3. 2:4 specifies slot number 2, port 4. 1:3-2:4 specifies all of the ports between slot 1, port 3 and slot 2, port 4 – in numerical order.
Restrictions	None.

Example usage:

To display the current 802.1p default priority configuration on the switch:


```
DES-6500:4# show 802.1p default_priority
```

```
Command: show 802.1p default_priority
```

Port	Priority
1:1	0
1:2	0
1:3	0
1:4	0
1:5	0
1:6	0
1:7	0
1:8	0
1:9	0
1:10	0
1:11	0
1:12	0
2:1	0
2:2	0
2:3	0
2:4	0
2:5	0
2:6	0
2:7	0
2:8	0
2:9	0
2:10	0
2:11	0
2:12	0

```
DES-6500:4#
```

config scheduling_mechanism

Purpose	Used to configure the scheduling mechanism for the QoS function
Syntax	config scheduling_mechanism [strict weight_fair]
Description	<p>The config scheduling_mechanism command allows the user to select between a Weight Fair and a Strict mechanism for emptying the priority queues of the QoS function. The switch contains 8 hardware priority queues. Incoming packets must be mapped to one of these eight queues. This command is used to specify the rotation by which these eight hardware priority queues are emptied.</p> <p>The switch's default is to empty the 8 hardware priority queues in order – from the highest priority queue (hardware queue 7) to the lowest</p>

config scheduling_mechanism

	priority queue (hardware queue 0). Each hardware queue will transmit all of the packets in its buffer before allowing the next lower priority queue to transmit its packets. When the lowest hardware priority queue has finished transmitting all of its packets, the highest hardware priority queue can again transmit any packets it may have received.
Parameters	<p>strict – Entering the strict parameter indicates that the highest queue is the first to be processed. That is, the highest queue should finish emptying before the others begin.</p> <p>weight_fair – Entering the weight fair parameter indicates that the priority queues will empty packets in a round-robin order. That is to say that they will be emptied in an even distribution.</p>
Restrictions	Only administrator-level users can issue this command.

Example usage:

To configure the traffic scheduling mechanism for each COS queue:

```
DES-6500:4#config scheduling_mechanism strict
Command: config scheduling_mechanism strict

Success.

DES-6500:4#
```

show scheduling_mechanism

Purpose	Used to display the current traffic scheduling mechanisms in use on the switch.
Syntax	show scheduling_mechanism
Description	This command will display the current traffic scheduling mechanisms in use on the switch.
Parameters	none.
Restrictions	none.

Example Usage:

To show the scheduling mechanism:

```
DES-6500:4#show scheduling_mechanism
```

```
Command: show scheduling_mechanism
```

```
QOS scheduling_mechanism
```

```
CLASS ID Mechanism
```

```
-----
```

```
Class-0 strict
```

```
Class-1 strict
```

```
Class-2 strict
```

```
Class-3 strict
```

```
Class-4 strict
```

```
Class-5 strict
```

```
Class-6 strict
```

```
DES-6500:4#
```

enable hol_prevention

Purpose	Used to enable HOL prevention.
Syntax	enable hol_prevention
Description	The enable hol_prevention command enables Head of Line prevention.
Parameters	none.
Restrictions	You must have administrator privileges.

Example Usage:

To enable HOL prevention:

```
DES-6500:4#enable hol_prevention
```

```
Command: enable hol_prevention
```

```
Success.
```

```
DES-6500:4#:4#
```

disable hol_prevention

Purpose	Used to disable HOL prevention.
Syntax	disable hol_prevention
Description	The disable hol_prevention command disables Head of Line prevention.
Parameters	none.
Restrictions	You must have administrator privileges.

Example Usage:

To disable HOL prevention:

```
DES-6500:4#disable hol_prevention
Command: disable hol_prevention

Success.

DES-6500:4#
```

show hol_prevention

Purpose	Used to show HOL prevention.
Syntax	show hol_prevention
Description	The show hol_prevention command displays the Head of Line prevention state.
Parameters	none.
Restrictions	none.

Example Usage:

To show HOL prevention:

```
DES-6500:4#show hol_prevention
Command: show hol_prevention

Device HOL Prevention State Enabled

DES-6500:4#
```

PORT MIRRORING COMMANDS

The port mirroring commands in the Command Line Interface (CLI) are listed (along with the appropriate parameters) in the following table.

Command	Parameters
config mirror port	<port> [add delete] source ports <portlist> [rx tx both]
enable mirror	
disable mirror	
show mirror	

Each command is listed, in detail, in the following sections.

config mirror port

Purpose	Used to configure a mirror port – source port pair on the switch.
Syntax	config mirror port <port> add source ports <portlist> [rx tx both]
Description	This command allows a range of ports to have all of their traffic also sent to a designated port, where a network sniffer or other device can monitor the network traffic. In addition, you can specify that only traffic received by or sent by one or both is mirrored to the Target port.
Parameters	<p><port> – This specifies the Target port (the port where mirrored packets will be sent).</p> <p>source ports – The port or ports being mirrored. This cannot include the Target port.</p> <p><portlist> – This specifies a range of ports that will be mirrored. That is, the range of ports in which all traffic will be copied and sent to the Target port. The port list is specified by listing the lowest slot number and the beginning port number on that slot, separated by a colon. Then the highest slot number, and the highest port number of the range (also separated by a colon) are specified. The beginning and end of the port list range are separated by a dash. For example, 1:3 specifies slot number 1, port 3. 2:4 specifies slot number 2, port 4. 1:3-2:4 specifies all of the ports between slot 1, port 3 and slot 2, port 4 – in numerical order.</p> <p>rx – Allows the mirroring of only packets received by (flowing into) the port or ports in the port list.</p> <p>tx – Allows the mirroring of only packets sent to (flowing out of) the port or ports in the port list.</p> <p>both – Mirrors all the packets received or sent by the port or ports in the port list.</p>
Restrictions	The Target port cannot be listed as a source port. Only administrator-level users can issue this command.

Example usage:

To add the mirroring ports:

```
DES6500:4#config mirror port 4:1 add source ports 4:3-4:5
both
Command: config mirror port 4:1 add source ports 4:3-4:5
both

Success.

DES-6500:4#
```

config mirror delete

Purpose	Used to delete a port mirroring configuration
Syntax	config mirror port <port> delete source port <portlist> [rx tx both]
Description	This command is used to delete a previously entered port mirroring configuration.
Parameters	<p><port> – This specifies the Target port (the port where mirrored packets will be sent).</p> <p><portlist> – This specifies a range of ports that will be mirrored. That is, the range of ports in which all traffic will be copied and sent to the Target port.</p> <p>rx – Allows the mirroring of only packets received by (flowing into) the port or ports in the port list.</p> <p>tx – Allows the mirroring of only packets sent to (flowing out of) the port or ports in the port list.</p> <p>both – Mirrors all the packets received or sent by the port or ports in the port list.</p>
Restrictions	Only administrator-level users can issue this command.

Example usage:

To delete the mirroring ports:

```
DES-6500:4#config mirror port 1:5 delete source port 1:1-1:5
both
Command: config mirror 1:5 delete source 1:1-1:5 both

Success.

DES-6500:4#
```

enable mirror

Purpose	Used to enable a previously entered port mirroring configuration.
Syntax	enable mirror
Description	This command, combined with the disable mirror command below, allows you to enter a port mirroring configuration into the switch, and then turn the port mirroring on and off without having to modify the port mirroring configuration.
Parameters	None.
Restrictions	Only Administrator-level users can issue this command.

Example usage:

To enable mirroring configurations:

```
DES-6500:4#enable mirror
```

```
Command: enable mirror
```

```
Success.
```

```
DES-6500:4#
```

disable mirror

Purpose	Used to disable a previously entered port mirroring configuration.
Syntax	disable mirror
Description	This command, combined with the enable mirror command above, allows you to enter a port mirroring configuration into the switch, and then turn the port mirroring on and off without having to modify the port mirroring configuration.
Parameters	None.
Restrictions	Only administrator-level users can issue this command.

Example usage:

To disable mirroring configurations:

```
DES-6500:4#disable mirror
```

```
Command: disable mirror
```

```
Success.
```

```
DES-6500:4#
```

show mirror

Purpose	Used to show the current port mirroring configuration on the switch.
Syntax	show mirror
Description	This command displays the current port mirroring configuration on the switch.
Parameters	None
Restrictions	None.

Example usage:

To display mirroring configuration:

```
DES-6500:4#show mirror
```

```
Command: show mirror
```

```
Current Settings
```

```
Mirror Status: Enabled
```

```
Target Port: 9
```

```
Mirrored Port:
```

```
  RX:
```

```
  TX: 1:1-1:5
```

```
DES-6500:4#
```


VLAN COMMANDS

The VLAN commands in the Command Line Interface (CLI) are listed (along with the appropriate parameters) in the following table.

Command	Parameters
create vlan	<vlan_name 32> tag <vlanid 2-4094> advertisement
delete vlan	<vlan_name 32>
config vlan	<vlan_name 32> add [tagged untagged forbidden] delete <portlist> advertisement [enable disable]
config gvrp	<portlist> all state [enable disable] ingress_checking [enable disable] acceptable_frame [tagged_only admit_all] pvid <vlanid 1-4094>
enable gvrp	
disable gvrp	
show vlan	<vlan_name 32>
show gvrp	<portlist>

Each command is listed, in detail, in the following sections.

create vlan

Purpose	Used to create a VLAN on the switch.
Syntax	create vlan <vlan_name 32> {tag <vlanid 2-4094> advertisement}
Description	This command allows you to create a VLAN on the switch.
Parameters	<p><vlan_name 32> – The name of the VLAN to be created.</p> <p><vlanid> – The VLAN ID of the VLAN to be created. Allowed values = 2-4094</p> <p>advertisement – Specifies that the VLAN is able to join GVRP. If this parameter is not set, the VLAN cannot be configured to have forbidden ports.</p>
Restrictions	Each VLAN name can be up to 32 characters. If the VLAN is not given a tag, the system will automatically assign a VLAN ID number for the VLAN. Only administrator-level users can issue this command.

Example usage:

To create a VLAN v1, tag 2:

```
DES-6500:4#create vlan v1 tag 2
```

```
Command: create vlan v1 tag 2
```

```
Success.
```

```
DES-6500:4#
```

delete vlan

Purpose	Used to delete a previously configured VLAN on the switch.
Syntax	delete vlan <vlan_name 32>
Description	This command will delete a previously configured VLAN on the switch.
Parameters	<vlan_name 32> – The VLAN name of the VLAN you want to delete.
Restrictions	Only administrator-level users can issue this command.

Example usage:

To remove the vlan “v1”:

```
DES-6500:4#delete vlan v1
```

```
Command: delete vlan v1
```

```
Success.
```

```
DES-6500:4#
```

config vlan

Purpose	Used to add additional ports to a previously configured VLAN.
Syntax	config vlan <vlan_name 32> { [add [tagged untagged forbidden] delete] <portlist> advertisement [enabled disabled]}
Description	This command allows you to add or delete ports to the port list of a previously configured VLAN. You can specify the additional ports as tagging, untagging, or forbidden. The default is to assign the ports as untagging.

config vlan

Parameters	<p><vlan_name 32> – The name of the VLAN you want to add ports to.</p> <p>add – Specifies all of the ports on the switch.</p> <p>tagged – Specifies the additional ports as tagged.</p> <p>untagged – Specifies the additional ports as untagged.</p> <p>forbidden – Specifies the additional ports as forbidden.</p> <p>delete – Deletes the above specified ports from the specified VLAN on the switch.</p> <p><portlist> – A range of ports to add to the VLAN. The port list is specified by listing the lowest slot number and the beginning port number on that slot, separated by a colon. Then the highest slot number, and the highest port number of the range (also separated by a colon) are specified. The beginning and end of the port list range are separated by a dash. For example, 1:3 specifies slot number 1, port 3. 2:4 specifies slot number 2, port 4. 1:3-2:4 specifies all of the ports between slot 1, port 3 and slot 2, port 4 – in numerical order.</p> <p>advertisement [enabled disabled] – Enables or disables GVRP on the specified VLAN.</p>
Restrictions	Only administrator-level users can issue this command.

Example usage:

To add 4 through 8 of module 2 as tagged ports to the VLAN v1:

```
DES-6500:4#config vlan v1 add tagged 2:4-2:8
```

```
Command: config vlan v1 add tagged 2:4-2:8
```

```
Success.
```

```
DES-6500:4#
```

config gvrp

Purpose	Used to configure GVRP on the switch.
Syntax	config gvrp [<portlist> all] {state [enabled disabled]}[ingress_checking [enabled disabled] acceptable_frame [tagged_only admit_all] pvid <vlanid 1-4094>}
Description	This command is used to configure the Group VLAN Registration Protocol on the switch. You can configure ingress checking, the sending and receiving of GVRP information, and the Port VLAN ID (PVID).

config gvrp

Parameters	<p><portlist> – Specifies a range of ports to be configured. The port list is specified by listing the lowest slot number and the beginning port number on that slot, separated by a colon. Then the highest slot number, and the highest port number of the range (also separated by a colon) are specified. The beginning and end of the port list range are separated by a dash. For example, 1:3 specifies slot number 1, port 3. 2:4 specifies slot number 2, port 4. 1:3-2:4 specifies all of the ports between slot 1, port 3 and slot 2, port 4 – in numerical order.</p> <p>all – Specifies all of the ports on the switch.</p> <p>state [enabled disabled] – Enables or disables GVRP for the ports specified in the port list.</p> <p>ingress_checking [enabled disabled] – Enables or disables ingress checking for the specified port list.</p> <p> acceptable_frame – defines what type of packets ingress checking will check for.</p> <p> tagged_only – specifies that only tagged packets will be allowed.</p> <p> admit_all – specifies that all types of packets will be allowed.</p> <p>pvid <vlanid 1-4094> – Specifies the default VLAN associated with the port.</p>
Restrictions	Only administrator-level users can issue this command.

Example usage:

To set the ingress checking status, the sending and receiving GVRP information :

```
DES-6500:4#config gvrp 1:4 state enabled ingress_checking
enabled acceptable_frame tagged_only pvid 2
```

```
Command: config gvrp 1:4 state enabled ingress_checking
enabled acceptable_frame tagged_only pvid 2
```

```
Success.
```

```
DES-6500:4#
```

enable gvrp

Purpose	Used to enable GVRP on the switch.
Syntax	enable gvrp
Description	This command, along with disable gvrp below, is used to enable and disable GVRP on the switch, without changing the GVRP configuration on the switch.

enable gvrp

Parameters	None.
Restrictions	Only administrator-level users can issue this command.

Example usage:

To enable the generic VLAN Registration Protocol (GVRP):

```
DES-6500:4#enable gvrp
```

```
Command: enable gvrp
```

```
Success.
```

```
DES-6500:4#
```

disable gvrp

Purpose	Used to disable GVRP on the switch.
Syntax	disable gvrp
Description	This command, along with disable gvrp below, is used to enable and disable GVRP on the switch, without changing the GVRP configuration on the switch.
Parameters	None.
Restrictions	Only administrator-level users can issue this command.

Example usage:

To disable the Group VLAN Registration Protocol (GVRP):

```
DES-6500:4#disable gvrp
```

```
Command: disable gvrp
```

```
Success.
```

```
DES-6500:4#
```

show vlan

Purpose	Used to display the current VLAN configuration on the switch
Syntax	show vlan {<vlan_name 32>}
Description	This command displays summary information about each VLAN including the VLAN ID, VLAN name, the Tagging Untagging status, and the Member Non-member Forbidden status of each port that is a member of the VLAN.
Parameters	<vlan_name 32> – The VLAN name of the VLAN for which you want to display a summary of settings.
Restrictions	None.

Example usage:

To display the switch's current VLAN settings:

```
DES-6500:4#show vlan
Command: show vlan

VID          : 1          VLAN Name    : default
VLAN TYPE    : static    Advertisement : Enabled
Member ports : 1:1-1:12,2:1-2:12
  Static ports : 1:1-1:12,2:1-2:12
Untagged ports : 1:1-1:12,2:1-2:12
Forbidden ports :

Total Entries : 1

DES-6500:4#
```

show gvrp

Purpose	Used to display the GVRP status for a port list on the switch.
Syntax	show gvrp {<portlist>}
Description	This command displays the GVRP status for a port list on the switch
Parameters	<portlist> – Specifies a range of ports for which the GVRP status is to be displayed. The port list is specified by listing the lowest slot number and the beginning port number on that slot, separated by a colon. Then the highest slot number, and the highest port number of the range (also separated by a colon) are specified. The beginning and end of the port list range are separated by a dash. For example, 1:3 specifies slot number 1, port 3. 2:4 specifies slot number 2, port 4. 1:3-2:4 specifies all of the ports between slot 1, port 3 and slot 2, port 4 – in numerical order.

show gvrp

Restrictions None.

Example usage:

To display GVRP port status:

```
DES-6500:4#show gvrp
Command: show gvrp

Global GVRP : Disabled

Port      PVID      GVRP      Ingress Checking  Acceptable Frame Type
-----
1         1         Disabled  Enabled           All Frames
2         1         Disabled  Enabled           All Frames
3         1         Disabled  Enabled           All Frames
4         1         Disabled  Enabled           All Frames
5         1         Disabled  Enabled           All Frames
6         1         Disabled  Enabled           All Frames
7         1         Disabled  Enabled           All Frames
8         1         Disabled  Enabled           All Frames
9         1         Disabled  Enabled           All Frames
10        1         Disabled  Enabled           All Frames
11        1         Disabled  Enabled           All Frames
12        1         Disabled  Enabled           All Frames
13        1         Disabled  Enabled           All Frames
14        1         Disabled  Enabled           All Frames
15        1         Disabled  Enabled           All Frames
16        1         Disabled  Enabled           All Frames

Total Entries : 16

DES-6500:4#
```

LINK AGGREGATION COMMANDS

The link aggregation commands in the Command Line Interface (CLI) are listed (along with the appropriate parameters) in the following table.

Command	Parameters
create link_aggregation	group_id <value 1-32> {type[lacp static]}
delete link_aggregation	group_id <value1-32>
config link_aggregation	group_id <value1-32> master_port <port> ports <portlist> state [enabled disabled]
config link_aggregation algorithm	mac_source mac_destination mac_source_dest ip_source ip_destination ip_source_dest
show link_aggregation	group_id <value1-32> algorithm
config lacp_ports	<portlist> mode [active passive]
show lacp_ports	{<portlist>}

Each command is listed, in detail, in the following sections.

create link_aggregation

Purpose	Used to create a link aggregation group on the switch.
Syntax	create link_aggregation group_id <value1-32> {type[lacp static]}
Description	This command will create a link aggregation group with a unique identifier.
Parameters	<p><value 1-32> – Specifies the group id. The switch allows up to 32 link aggregation groups to be configured. The group number identifies each of the groups.</p> <p>type – Specify the type of link aggregation used for the group. If the type is not specified the default type is static.</p> <p>lacp – This designates the port group as LACP compliant. LACP allows dynamic adjustment to the aggregated port group. LACP compliant ports may be further configured (see config lacp_ports). LACP compliant must be connected to LACP compliant devices.</p> <p>static – This designates the aggregated port group as static. Static port groups can not be changed as easily as LACP compliant port groups since both linked devices must be manually configured if the configuration of the trunked group is changed. If static link aggregation is used, be sure that both ends of the connection are properly</p>

create link_aggregation

configured and that all ports have the same speed/duplex settings.

Restrictions

Only administrator-level users can issue this command.

Example usage:

To create a link aggregation group:

```
DES-6500:4#create link_aggregation group_id 1
```

```
Command: create link_aggregation group_id 1
```

```
Success.
```

```
DES-6500:4#
```

delete link_aggregation group_id

Purpose

Used to delete a previously configured link aggregation group.

Syntax

```
delete link_aggregation group_id <value 1-32>
```

Description

This command is used to delete a previously configured link aggregation group.

Parameters

<value 1-32> – Specifies the group id. The switch allows up to 32 link aggregation groups to be configured. The group number identifies each of the groups.

Restrictions

Only administrator-level users can issue this command.

Example usage:

To delete link aggregation group:

```
DES-6500:4#delete link_aggregation group_id 6
```

```
Command: delete link_aggregation group_id 6
```

```
Success.
```

```
DES-6500:4#
```

config link_aggregation

config link_aggregation

Purpose	Used to configure a previously created link aggregation group.
Syntax	config link_aggregation group_id <value 1-32> {master_port <port> ports <portlist>} state [enabled disabled]
Description	This command allows you to configure a link aggregation group that was created with the create link_aggregation command above.
Parameters	<p><value 1-32> – Specifies the group id. The switch allows up to 32 link aggregation groups to be configured. The group number identifies each of the groups.</p> <p><port> – Master port ID. Specifies which port (by port number) of the link aggregation group will be the master port. All of the ports in a link aggregation group will share the port configuration with the master port.</p> <p><portlist> – Specifies a range of ports that will belong to the link aggregation group. The DES-6500 will only support aggregated links where all of the aggregated ports are contained on the same line card (slot). The port list is specified by listing the slot number of the line card and the beginning port number on that slot, separated by a colon. Then the same slot number (because all of the aggregated ports must be on the same line card), and the highest port number of the range (also separated by a colon). The beginning and end of the port list range are separated by a dash. For example, 1:3 specifies slot number 1, port 3. 1:7 specifies slot number 1, port 7.</p> <p>state [enabled disabled] – Allows you to enable or disable the specified link aggregation group.</p>
Restrictions	Only administrator-level users can issue this command. Link aggregation groups may not overlap and must be contained on a single switch.

Example usage:

To define a load-sharing group of ports, group-id 1, master port 1:5 with group members ports 1:5-1:7 plus port 1:9:

```
DES-6500:4#config link_aggregation group_id 1 master_port 1:5 ports 1:5-1:7, 1:9
```

```
Command: config link_aggregation group_id 1 master_port 1:5 ports 1:5-1:7, 1:9
```

Success.

```
DES-6500:4#
```

config link_aggregation algorithm

Purpose	Used to configure the link aggregation algorithm.
Syntax	config link_aggregation algorithm [mac_source mac_destination mac_source_dest ip_source ip_destination ip_source_dest]
Description	This command configures to part of the packet examined by the switch when selecting the egress port for transmitting load-sharing data. This feature is only available using the address-based load-sharing algorithm.
Parameters	<p>mac_source – Indicates that the switch should examine the MAC source address.</p> <p>mac_destination – Indicates that the switch should examine the MAC destination address.</p> <p>mac_source_dest – Indicates that the switch should examine the MAC source and destination addresses</p> <p>ip_source – Indicates that the switch should examine the IP source address.</p> <p>ip_destination – Indicates that the switch should examine the IP destination address.</p> <p>ip_source_dest – Indicates that the switch should examine the IP source address and the destination address.</p>
Restrictions	Only administrator-level users can issue this command.

Example usage:

To configure link aggregation algorithm for mac-source-dest:

```
DES-6500:4#config link_aggregation algorithm
mac_source_dest
Command: config link_aggregation algorithm
mac_source_dest

Success.

DES-6500:4#
```

show link_aggregation

Purpose	Used to display the current link aggregation configuration on the switch.
Syntax	show link_aggregation {group_id <value 1-32> algorithm}
Description	This command will display the current link aggregation configuration of the switch.

show link_aggregation

	the switch.
Parameters	<p><value> – Specifies the group id. The switch allows up to 32 link aggregation groups to be configured. The group number identifies each of the groups.</p> <p>algorithm – Allows you to specify the display of link aggregation by the algorithm in use by that group.</p>
Restrictions	None.

Example usage:

To display Link Aggregation configuration:

```
DES-6500:4#show link_aggregation
Command: show link_aggregation

Link Aggregation Algorithm = MAC-source-dest
Group ID      : 1
TYPE          : TRUNK
Master Port   : 1:5
Member Port   : 1:5-1:10
Active Port   : 1:5-1:10
Status        : Enabled
Flooding Port : 1:6
```

config lacp_ports

Purpose	Used to configure settings for LACP compliant ports.
Syntax	config lacp_ports <portlist> mode [active passive]
Description	This command is used to configure ports that have been previously designated as LACP ports (see create link_aggregation).
Parameters	<p><portlist> – Specifies a range of ports to be configured. The port list is specified by listing the lowest slot number and the beginning port number on that slot, separated by a colon. Then the highest slot number, and the highest port number of the range (also separated by a colon) are specified. The beginning and end of the port list range are separated by a dash. For example, 1:3 specifies slot number 1, port 3. 2:4 specifies slot number 2, port 4. 1:3-2:4 specifies all of the ports between slot 1, port 3 and slot 2, port 4 – in numerical order.</p> <p>mode – Select the mode to determine if LACP ports will initially send LACP control frames.</p>

config lacp_ports

active – Active LACP ports are capable of processing and sending LACP control frames. This allows LACP compliant devices to negotiate the aggregated link so the group may be changed dynamically as needs require. In order to utilize the ability to change an aggregated port group, that is, to add or subtract ports from the group, at least one of the participating devices must designate LACP ports as active. Both devices must support LACP. Only one side is designated active while the other side is designated passive.

passive – LACP ports that are designated as passive cannot initially send LACP control frames, unless it receives LACP control frames on the port. In order to allow the linked port group to negotiate adjustments and make changes dynamically, at one end of the connection must have “active” LACP ports (see above).

Restrictions

Only administrator-level users can issue this command.



Note: For LACP implementations, both devices utilizing the aggregated link must support IEEE 802.3ad Link Aggregation Control Protocol and one device must designate the participating ports as “active” while the other device must designate the participating ports as “passive”.

Example usage:

To configure LACP port mode settings:

```
DES-6500:4#config lacp_port 1:1-1:2 mode active
```

```
Command: config lacp_port 1:1-1:2 mode active
```

```
Success.
```

```
DES-6500:4#
```

show lacp_port

Purpose	Used to display current LACP port mode settings.
Syntax	show lacp_port {<portlist>}
Description	This command will display the LACP mode settings as they are currently configured.
Parameters	<portlist> -
Restrictions	Only administrator-level users can issue this command.

Example usage:

To display LACP port mode settings:

```
DES-6500:4#show lacp_port
Command: show lacp_port

Port    Activity
-----  -
1:1     Active
1:2     Active
1:3     Active
1:4     Active
1:5     Active
1:6     Active
1:7     Active
1:8     Active
1:9     Active
1:10    Active
1:11    Active

DES-6500:4#
```

BASIC IP COMMANDS

The IP interface commands in the Command Line Interface (CLI) are listed (along with the appropriate parameters) in the following table.

Command	Parameters
enable ipif	<ipif_name 12 all>
create ipif	<ipif_name 12> <network_address> <vlan_name 32> {state [enabled disabled]}
config ipif	<ipif_name 12> ipaddress <network_address> vlan <vlan_name 32> state [enabled disabled] bootp dhcp
show ipif	<ipif_name 12>
delete ipif	<ipif_name 12 all>
disable ipif	<ipif_name 12 all>

Each command is listed, in detail, in the following sections.

enable ipif

Purpose	Used to enable an IP interface on the switch.
Syntax	enable ipif {<ipif_name> all}
Description	This command will enable the IP interface function on the switch.
Parameters	<ipif_name> – The name for the IP interface to be created. all – Entering this parameter will delete all the IP interfaces currently configured on the switch.
Restrictions	none

Example usage:

To enable the ipif function on the switch:

```
DES-6500:4#enable ipif s2
Command: enable ipif s2

Success.

DES-6500:4#
```

create ipif

Purpose	Used to create an IP interface on the switch.
Syntax	create ipif <ipif_name 12> <network_address> <vlan_name 32> {state [enabled disabled]}
Description	This command will create an IP interface.
Parameters	<p><ipif_name 12> – The name for the IP interface to be created.</p> <p><network_address> – IP address and netmask of the IP interface to be created. You can specify the address and mask information using the traditional format (for example, 10.1.2.3/255.0.0.0 or in CIDR format, 10.1.2.3/8).</p> <p><vlan_name 32> – The name of the VLAN that will be associated with the above IP interface.</p> <p>state [enabled disabled] – Allows you to enable or disable the IP interface.</p>
Restrictions	Only administrator-level users can issue this command.

Example usage:

To create an IP interface on the switch:

```
DES-6500:4#create ipif Trinity 10.48.74.122/8 v2 state enabled
Command: create ipif Trinity 10.48.74.122/8 v2 state enabled

Success.

DES-6500:4#
```

config ipif

Purpose	Used to configure the System IP interface.
Syntax	config ipif <ipif_name 12> [{ipaddress <network_address> vlan <vlan_name 32> state [enabled disabled]} bootp dhcp]
Description	This command is used to configure the System IP interface on the switch.
Parameters	<p>ipaddress <network_address> – IP address and netmask of the IP interface to be created. You can specify the address and mask information using the traditional format (for example, 10.1.2.3/255.0.0.0 or in CIDR format, 10.1.2.3/8).</p> <p><vlan_name 32> – The name of the VLAN corresponding to the System</p>

config ipif

IP interface.

state [enabled|disabled] – Allows you to enable or disable the IP interface.

bootp – Allows the selection of the BOOTP protocol for the assignment of an IP address to the switch's System IP interface.

dhcp – Allows the selection of the DHCP protocol for the assignment of an IP address to the switch's System IP interface.

Restrictions

Only administrator-level users can issue this command.

Example usage:

To configure the IP interface System:

```
DES-6500:4#config ipif System ipaddress 10.48.74.122/8
```

```
Command: config ipif System ipaddress 10.48.74.122/8
```

```
Success.
```

```
DES-6500:4#
```

show ipif

Purpose

Used to display the configuration of an IP interface on the switch.

Syntax

```
show ipif <ipif_name 12>
```

Description

This command will display the configuration of an IP interface on the switch.

Parameters

<ipif_name> – The name created for the IP interface.

Restrictions

None.

Example usage:

To display IP interface settings.

```

DES-6500:4#show ipif System
Command: show ipif System

IP Interface Settings
Interface Name : System
IP Address   : 10.48.74.122 (MANUAL)
Subnet Mask  : 255.0.0.0
VLAN Name   : default
Admin. State : Disabled
Link Status  : Link UP
Member Ports : 1:1-1:12

```

```

DES-6500:4#

```

delete ipif

Purpose	Used to delete the configuration of an IP interface on the switch.
Syntax	delete ipif <ipif_name 12 all>
Description	This command will delete the configuration of an IP interface on the switch.
Parameters	<p><ipif_name> – The name created for the IP interface.</p> <p>all – Entering this parameter will delete all the IP interfaces currently configured on the switch.</p>
Restrictions	None.

Example usage:

To delete the IP interface named s2:

```

DES-6500:4#delete ipif s2
Command: delete ipif s2

```

```

Success.

```

```

DES-6500:4#

```

disable ipif

Purpose	Used to disable the configuration of an IP interface on the switch.
Syntax	disable ipif <ipif_name 12 all>
Description	This command will disable the configuration of an IP interface on the switch.
Parameters	<ipif_name> – The name created for the IP interface. all – Entering this parameter will delete all the IP interfaces currently configured on the switch.
Restrictions	None.

Example usage:

To delete the IP interface named “s2”:

```
DES-6500:4#disable ipif s2
```

```
Command: disable ipif s2
```

```
Success.
```

```
DES-6500:4#
```

IGMP SNOOPING COMMANDS

The IGMP Snooping commands in the Command Line Interface (CLI) are listed (along with the appropriate parameters) in the following table.

Command	Parameters
config igmp_snooping	<vlan_name 32> all host_timeout <sec 1-16711450> router_timeout <sec 1-16711450> leave_timer <sec 1-16711450> state [enabled disabled]
config igmp_snooping querier	<vlan_name 32> all query_interval <sec 1-65535> max_response_time <sec 1-25> robustness_variable <value 1-255> last_member_query_interval <sec 1-25> state [enabled disabled]
config router_ports	<vlan_name 32> [add delete] <portlist>
enable igmp_snooping	{forward_mcrouter_only}
show igmp_snooping	{vlan <vlan_name 32>}
disable igmp_snooping	{forward_mcrouter_only}
show ipfdb	<ipaddr>
show igmp_snooping group	{vlan <vlan_name 32>}
show router ports	vlan <vlan_name 32> static dynamic forbidden
show igmp_snooping forwarding	{vlan<vlan_name 32>}

Each command is listed, in detail, in the following sections.

config igmp_snooping

Purpose	Used to configure IGMP snooping on the switch.
Syntax	config igmp_snooping [<vlan_name 32> all] {host_timeout <sec> router_timeout <sec> leave_timer <sec> state [enabled disabled]}
Description	This command allows you to configure IGMP snooping on the switch.
Parameters	<vlan_name 32> – The name of the VLAN for which IGMP snooping is to be configured.

config igmp_snooping

host_timeout <sec> – Specifies the maximum amount of time a host can be a member of a multicast group without the switch receiving a host membership report. The default is 260 seconds.

router_timeout <sec> – Specifies the maximum amount of time a route can be a member of a multicast group without the switch receiving a host membership report. The default is 260 seconds.

leave_timer <sec> – Leave timer. The default is 2 seconds.

state [enabled|disabled] – Allows you to enable or disable IGMP snooping for the specified VLAN.

Restrictions

Only administrator-level users can issue this command.

Example usage:

To configure the IGMP snooping:

```
DES-6500:4#config igmp_snooping default host_timeout 250
state enabled
```

```
Command: config igmp_snooping default host_timeout 250
state enabled
```

Success.

```
DES-6500:4#
```

config igmp_snooping querier

Purpose

This command configures IGMP snooping querier.

Syntax

```
config igmp_snooping querier [<vlan_name 32>|all] {query_interval
<sec>|max_response_time <sec>|robustness_variable
<value>|last_member_query_interval <sec>|state
[enabled|disabled]}
```

Description

Used to configure the time in seconds between general query transmissions, the maximum time in seconds to wait for reports from members and the permitted packet loss that guarantees IGMP snooping.

Parameters

<vlan_name 32> – The name of the VLAN for which IGMP snooping querier is to be configured.

query_interval <sec> – Specifies the amount of time in seconds between general query transmissions. The default setting is 125 seconds.

max_response_time <sec> – Specifies the maximum time in seconds to wait for reports from members. The default setting is 10 seconds.

config igmp_snooping querier

robustness_variable <value> – Provides fine-tuning to allow for expected packet loss on a subnet. The value of the robustness variable is used in calculating the following IGMP message intervals:

- **Group member interval**—Amount of time that must pass before a multicast router decides there are no more members of a group on a network. This interval is calculated as follows: (robustness variable x query interval) + (1 x query response interval).
- **Other querier present interval**—Amount of time that must pass before a multicast router decides that there is no longer another multicast router that is the querier. This interval is calculated as follows: (robustness variable x query interval) + (0.5 x query response interval).
- **Last member query count**—Number of group-specific queries sent before the router assumes there are no local members of a group. The default number is the value of the robustness variable.
- By default, the robustness variable is set to 2. You might want to increase this value if you expect a subnet to be lossy.

last_member_query_interval <sec> – The maximum amount of time between group-specific query messages, including those sent in response to leave-group messages. You might lower this interval to reduce the amount of time it takes a router to detect the loss of the last member of a group.

state [enabled|disabled] – Allows the switch to be specified as an IGMP Querier or Non-querier.

Restrictions

Only administrator-level users can issue this command.

Example usage:

To configure the igmp snooping:

```
DES-6500:4#config igmp_snooping querier default  
query_interval 125 state enabled
```

```
Command: config igmp_snooping querier default  
query_interval 125 state enabled
```

```
Success.
```

```
DES-6500:4#
```

config router_ports

Purpose	Used to configure ports as router ports.
Syntax	config router_ports <vlan_name 32> [add delete] <portlist>
Description	This command allows you to designate a range of ports as being connected to multicast-enabled routers. This will ensure that all packets with such a router as its destination will reach the multicast-enabled router – regardless of protocol, etc.
Parameters	<p><vlan_name 32> – The name of the VLAN on which the router port resides.</p> <p><portlist> – Specifies a range of ports that will be configured as router ports. The port list is specified by listing the lowest slot number and the beginning port number on that slot, separated by a colon. Then the highest slot number, and the highest port number of the range (also separated by a colon) are specified. The beginning and end of the port list range are separated by a dash. For example, 1:3 specifies slot number 1, port 3. 2:4 specifies slot number 2, port 4. 1:3-2:4 specifies all of the ports between slot 1, port 3 and slot 2, port 4 – in numerical order.</p>
Restrictions	Only administrator-level users can issue this command.

Example usage:

To set up static router ports:

```
DES-6500:4#config router_ports default add 2:1-2:10
```

```
Command: config router_ports default add 2:1-2:10
```

```
Success.
```

```
DES-6500:4#
```

enable igmp_snooping

Purpose	Used to enable IGMP snooping on the switch.
Syntax	enable igmp_snooping {forward_mcrouter_only}
Description	This command allows you to enable IGMP snooping on the switch. If forward_mcrouter_only is specified, the switch will only forward all multicast traffic to the multicast router, only. Otherwise, the switch forwards all multicast traffic to any IP router.
Parameters	forward_mcrouter_only – Specifies that the switch should only forward all multicast traffic to a multicast-enabled router. Otherwise, the switch will forward all multicast traffic to any IP router.
Restrictions	Only administrator-level users can issue this command.

Example usage:

To enable IGMP snooping on the switch:

```
DES-6500:4#enable igmp_snooping
Command: enable igmp_snooping

Success.
```

disable igmp_snooping

Purpose	Used to enable IGMP snooping on the switch.
Syntax	disable igmp_snooping {forward_mcrouter_only}
Description	This command disables IGMP snooping on the switch. IGMP snooping can be disabled only if IP multicast routing is not being used. Disabling IGMP snooping allows all IGMP and IP multicast traffic to flood within a given IP interface.
Parameters	forward_mcrouter_only – if this is specified, the switch will forward all multicast packets to any connected IP router.
Restrictions	Only administrator-level users can issue this command.

Example usage:

To disable IGMP snooping on the switch:

```
DES-6500:4#disable igmp_snooping
Command: disable igmp_snooping

Success.

DES-6500:4#
```

show igmp_snooping

Purpose	Used to show the current status of IGMP snooping on the switch.
Syntax	show igmp_snooping {vlan <vlan_name 32>}
Description	This command will display the current IGMP snooping configuration on the switch.
Parameters	<vlan_name 32> – The name of the VLAN for which you want to view the IGMP snooping configuration.

show igmp_snooping

the IGMP snooping configuration.

Restrictions None.

Example usage:

To show igmp snooping:

```
DES-6500:4#show igmp_snooping
Command: show igmp_snooping

IGMP Snooping Global State   : Disabled
Multicast router Only       : Disabled

VLAN Name                    : default
Query Interval               : 125
Max Response Time           : 10
Robustness Value            : 2
Last Member Query Interval  : 1
Host Timeout                 : 260
Route Timeout                : 260
Leave Timer                   : 2
Querier State                : Disabled
Querier Router Behavior     : Non-Querier
State                        : Disabled

Total Entries: 1

DES-6500:4#
```

show igmp_snooping group

Purpose Used to display the current IGMP snooping group configuration on the switch.

Syntax **show igmp_snooping group {vlan <vlan_name 32>}**

Description This command will display the current IGMP snooping group configuration on the switch.

Parameters <vlan_name 32> – The name of the VLAN for which you want to view IGMP snooping group configuration information.

Restrictions None.

Example usage:

To show igmp snooping group:

```
DES-6500:4#show igmp_snooping group
Command: show igmp_snooping group

VLAN Name    : default
Multicast group: 224.0.0.2
MAC address   : 01-00-5E-00-00-02
Reports      : 1
Port Member   : 1:2,2:7

VLAN Name    : default
Multicast group: 224.0.0.9
MAC address   : 01-00-5E-00-00-09
Reports      : 1
Port Member   : 1:12,2:4

VLAN Name    : default
Multicast group: 234.5.6.7
MAC address   : 01-00-5E-05-06-07
Reports      : 1
Port Member   : 1:6,2:9

Total Entries : 3

DES-6500:4#
```

show router_ports

Purpose	Used to display the currently configured router ports on the switch.
Syntax	show router_ports {vlan <vlan_name 32>} {static dynamic forbidden}
Description	This command will display the router ports currently configured on the switch.
Parameters	<vlan_name 32> – The name of the VLAN on which the router port resides. static – Displays router ports that have been statically configured. dynamic – Displays router ports that have been dynamically configured.

show router_ports

	forbidden –Displays router ports that have been labeled as forbidden.
Restrictions	None.

Example usage:

To display the router ports.

```
DES-6500:4#show router_ports
```

```
Command: show router_ports
```

```
VLAN Name      : default
```

```
Static router port  : 2:1-2:10
```

```
Dynamic router port :
```

```
Forbidden router port :
```

```
VLAN Name      : vlan2
```

```
Static router port :
```

```
Dynamic router port :
```

```
Forbidden router port :
```

```
Total Entries: 2
```

```
DES-6500:4#
```

show igmp_snooping forwarding

Purpose	Used to display the IGMP snooping forwarding table entries on the switch.
Syntax	show igmp_snooping forwarding {vlan <vlan_name 32>}
Description	This command will display the current IGMP snooping forwarding table entries currently configured on the switch.
Parameters	<vlan_name 32> – The name of the VLAN for which you want to view IGMP snooping forwarding table information.
Restrictions	None.

Example usage:

To view the IGMP snooping forwarding table for VLAN “Trinity”:

DES-6500:4#show igmp_snooping forwarding vlan Trinity

Command: show igmp_snooping forwarding vlan Trinity

VLAN Name : Trinity

Multicast group : 224.0.0.2

MAC address : 01-00-5E-00-00-02

Port Member : 1:12

Total Entries: 1

DES-6500:4#

802.1X COMMANDS

The DES-6500 implements the server-side of the IEEE 802.1x Port-based and MAC-based Network Access Control. This mechanism is intended to allow only authorized users, or other network devices, access to network resources by establishing criteria for each port on the switch that a user or network device must meet before allowing that port to forward or receive frames.

Command	Parameters
enable 802.1x	
disable 802.1x	
create 802.1x user	<username 15>
show 802.1x user	
delete 802.1x user	<username 15>
show 802.1x auth_state	ports [<portlist> all]
show 802.1x auth_configuration	ports [<portlist> all]
config 802.1x capability	ports <portlist> all authenticator none
config 802.1x auth_parameter	ports <portlist> all default direction [both in] port_control [force_unauth auto force_auth] quiet_period <sec 0-65535> tx_period <sec 1-65535> supp_timeout <sec 1-65535> server_timeout <sec 1-65535> max_req <value 1-10> reauth_period <sec 1-65535> enable_reauth [enable disable]
config 802.1x auth_protocol	[local radius eap]
config 802.1x init	[port_based ports [<portlist> all]]
config 802.1x reauth	[port_based ports [<portlist> all]]
config radius add	<server_index 1-3> <server_ip> key <passwd 32> default auth_port <udp_port_number 1-65535> acct_port <udp_port_number 1-65535>
config radius delete	<server_index 1-3>
config radius	<server_index 1-3> ipaddress <server_ip>

Command	Parameters
	key <passwd 32> auth_port <udp_port_number 1-65535> acct_port <udp_port_number 1-65535>
show radius	
show acct_client	
show auth_client	
show auth_diagnostics	{ports [<portlist> all]}
show auth_session statistics	{ports [<portlist> all]}
show auth_statistics	{ports [<portlist> all]}

Each command is listed, in detail, in the following sections.

enable 802.1x

Purpose	Used to enable the 802.1x server on the switch.
Syntax	enable 802.1x
Description	The enable 802.1x command enables the 802.1x Port-based Network Access control server application on the switch.
Parameters	None.
Restrictions	Only administrator-level users can issue this command.

Example usage:

To enable 802.1x switch wide:

```
DES-6500:4#enable 802.1x
```

```
Command: enable 802.1x
```

```
Success.
```

```
DES-6500:4#
```

disable 802.1x

Purpose	Used to disable the 802.1x server on the switch.
Syntax	disable 802.1x
Description	The disable 802.1x command is used to disable the 802.1x Port-based Network Access control server application on the switch.
Parameters	None.
Restrictions	Only administrator-level users can issue this command.

Example usage:

To disable 802.1x on the switch:

```
DES-6500:4#disable 802.1x
Command: disable 802.1x

Success.

DES-6500:4#
```

create 802.1x user	
Purpose	Used to create a new 802.1x user.
Syntax	create 802.1x user <username 15>
Description	The create 802.1x user command is used to create new 802.1x users.
Parameters	<username 15> – A username can be as many as 15 alphanumeric characters.
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To create an 802.1x user:

```
DES-6500:4#create 802.1x user dtremblett
Command: create 802.1x user dtremblett

Enter a case-sensitive new password:*****
Enter the new password again for confirmation:*****
Success.

DES-6500:4#
```

show 802.1x user	
Purpose	Used to display the 802.1x user accounts on the switch.
Syntax	show 802.1x user <username 15>
Description	The show 802.1x user command is used to display the 802.1x Port-based Network Access control local users currently configured on the switch.
Parameters	<username 15> – A username can be as many as 15 alphanumeric characters.
Restrictions	Only administrator-level users can issue this command.

Example usage:

To view 802.1X users currently configured on the Switch:

```
DES-6500:4#show 802.1x user
Command: show 802.1x user
Current Accounts:
Username          Password
-----          -
Darren            Trinity
Total entries: 1

DES-6500:4#
```

delete 802.1x user	
Purpose	Used to delete an 802.1x user account on the switch.
Syntax	delete 802.1x user <username 15>
Description	The delete 802.1x user command is used to display the 802.1x Port-based Network Access control local users currently configured on the switch.
Parameters	<username 15> – A username can be as many as 15 alphanumeric characters.
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To delete 802.1x users:

```
DES-6500:4#delete 802.1x user
Command: delete 802.1x user dtremblett

Are you sure to delete the user?(y/n)
Success.

DES-6500:4#
```


show 802.1x auth_configuration

Purpose	Used to display the current configuration of the 802.1x server on the switch.
Syntax	show 802.1x auth_configuration {ports [<portlist> all]}
Description	The show 802.1x command is used to display the current configuration of the 802.1x Port-based Network Access Control server application on the switch.
Parameters	<p>auth_state – Displays the current 802.1x authentication state of the specified ports.</p> <p>auth_configuration - Displays the current 802.1x authentication configuration of the specified ports.</p> <p>ports <portlist> – Specifies a range of ports. The port list is specified by listing the lowest slot number and the beginning port number on that slot, separated by a colon. Then the highest slot number, and the highest port number of the range (also separated by a colon) are specified. The beginning and end of the port list range are separated by a dash. For example, 1:3 specifies slot number 1, port 3. 2:4 specifies slot number 2, port 4. 1:3-2:4 specifies all of the ports between slot 1, port 3 and slot 2, port 4 – in numerical order.</p> <p>all – specifies all of the ports on the switch.</p> <p>The following details what is displayed:</p> <p>802.1x Enabled Disabled – Shows the current status of 802.1x functions on the switch.</p> <p>Authentication Protocol: Radius_Eap – Shows the authentication protocol suite in use between the switch and a Radius server.</p> <p>Port number – Shows the physical port number on the switch.</p> <p>Capability: Authenticator None – Shows the capability of 802.1x functions on the port number displayed above. There are two 802.1x capabilities that can be set on the switch: Authenticator and None.</p> <p>AdminCtlDir: Both In – Shows whether a controlled Port that is unauthorized will exert control over communication in both receiving and transmitting directions, or just the receiving direction.</p> <p>OpenCtlDir: Both In – Shows whether a controlled Port that is unauthorized will exert control over communication in both receiving and transmitting directions, or just the receiving direction.</p> <p>Port Control: ForceAuth ForceUnauth Auto – Shows the administrative control over the port's authorization status. ForceAuth forces the Authenticator of the port to become Authorized. ForceUnauth forces the port to become Unauthorized.</p> <p>QuietPeriod – Shows the time interval between authentication failure and the start of a new authentication attempt.</p> <p>TxPeriod – Shows the time to wait for a response from a supplicant (user) to send EAP Request Identify packets.</p>

show 802.1x auth_configuration

SuppTimeout – Shows the time to wait for a response from a supplicant (user) for all EAP packets, except for the Request|Identity packets.

ServerTimeout – Shows the length of time to wait for a response from a Radius server.

MaxReq – Shows the maximum number of times to retry sending packets to the supplicant.

ReAuthPeriod – shows the time interval between successive re-authentications.

ReAuthenticate: Enabled|Disabled – Shows whether or not to re-authenticate.

Restrictions

Only administrator-level users can issue this command.

Example usage:

To display the 802.1x authentication states (stacking disabled):

```
DES-6500:4#show 802.1x auth_configuration ports 1
```

```
Command: show 802.1x auth_configuration ports 1
```

```
802.1X           : Enabled
Authentication Mode : Port_based
Authentication Protocol : Radius_Eap

Port number      : 1:2
Capability       : None
AdminCrIDir     : Both
OpenCrIDir      : Both
Port Control     : Auto
QuietPeriod     : 60 sec
TxPeriod        : 30 sec
SuppTimeout     : 30 sec
ServerTimeout   : 30 sec
MaxReq          : 2 times
ReAuthPeriod    : 3600 sec
ReAuthenticate   : Disabled
```

show 802.1x auth_state

show 802.1x auth_state

Purpose	Used to display the current authentication state of the 802.1x server on the switch.
Syntax	show 802.1x auth_state {ports [<portlist> all]}
Description	The show 802.1x auth_state command is used to display the current authentication state of the 802.1x Port-based Network Access Control server application on the switch.
Parameters	<p>ports <portlist> – Specifies a range of ports. The port list is specified by listing the lowest switch number and the beginning port number on that switch, separated by a colon. Then highest switch number, and the highest port number of the range (also separated by a colon) are specified. The beginning and end of the port list range are separated by a dash. For example, 3 would specify port 3. 4 specifies port 4. 3-4 specifies all of the ports between port 3 and port 4 – in numerical order.</p> <p>all – Specifies all of the ports on the switch.</p> <p>The following details what is displayed:</p> <p>Port number – Shows the physical port number on the switch.</p> <p>Auth PAE State: Initalize Disconnected Connecting Authenticating Authenticated Held ForceAuth ForceUnauth – Shows the current state of the Authenticator PAE.</p> <p>Backend State: Request Response Fail Idle Initalize Success Timeout – Shows the current state of the Backend Authenticator.</p> <p>Port Status: Authorized Unauthorized – Shows the result of the authentication process. Authorized means that the user was authenticated, and can access the network. Unauthorized means that the user was not authenticated, and cannot access the network.</p>
Restrictions	Only administrator-level users can issue this command.

Example usage:

To display the 802.1x auth state:

DES-6500:4#show 802.1x auth_state

Command: show 802.1x auth_state

Port	Auth PAE State	Backend State	Port Status
1:1	ForceAuth	Success	Authorized
1:2	ForceAuth	Success	Authorized
1:3	ForceAuth	Success	Authorized
1:4	ForceAuth	Success	Authorized
1:5	ForceAuth	Success	Authorized
1:6	ForceAuth	Success	Authorized
1:7	ForceAuth	Success	Authorized
1:8	ForceAuth	Success	Authorized
1:9	ForceAuth	Success	Authorized
1:10	ForceAuth	Success	Authorized
1:11	ForceAuth	Success	Authorized
1:12	ForceAuth	Success	Authorized
2:1	ForceAuth	Success	Authorized
2:2	ForceAuth	Success	Authorized
2:3	ForceAuth	Success	Authorized
2:4	ForceAuth	Success	Authorized
2:6	ForceAuth	Success	Authorized
2:7	ForceAuth	Success	Authorized
2:8	ForceAuth	Success	Authorized

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config 802.1x capability

Purpose	Used to configure the 802.1x capability of a range of ports on the switch.
Syntax	config 802.1x capability ports [<portlist> all] [authenticator none]
Description	The config 802.1x command has four capabilities that can be set for each port. Authenticator, Supplicant, Authenticator and Supplicant, and None.
Parameters	<p><portlist> – Specifies a range of ports. The port list is specified by listing the lowest slot number and the beginning port number on that slot, separated by a colon. Then the highest slot number, and the highest port number of the range (also separated by a colon) are specified. The beginning and end of the port list range are separated by a dash. For example, 1:3 specifies slot number 1, port 3. 2:4 specifies slot number 2, port 4. 1:3-2:4 specifies all of the ports between slot 1, port 3 and slot 2, port 4 – in numerical order.</p> <p>all – Specifies all of the ports on the switch.</p> <p>authenticator – A user must pass the authentication process to gain</p>

config 802.1x capability

	access to the network.
	none – The port is not controlled by the 802.1x functions.
Restrictions	Only administrator-level users can issue this command.

Example usage:

To configure 802.1x capability on ports 1-10 on switch 1:

```
DES-6500:4#config 802.1x capability ports 1:1 – 1:10 authenticator
Command: config 802.1x capability ports 1-10 authenticator

Success.

DES-6500:4#
```

config 802.1x auth_parameter

Purpose	Used to configure the 802.1x Authentication parameters on a range of ports. The default parameter will return all ports in the specified range to their default 802.1x settings.
Syntax	config 802.1x auth_parameter ports [<portlist> all] [default]{direction [both in] port_control [force_unauth auto force_auth] quiet_period <sec 0-65535> tx_period <sec 1-65535> supp_timeout <sec 1-65535> server_timeout <sec 1-65535> max_req <value 1- 10> reauth_period <sec 1-65535> enable_reauth [enable disable]]}
Description	The config 802.1x auth_parameter command is used to configure the 802.1x Authentication parameters on a range of ports. The default parameter will return all ports in the specified range to their default 802.1x settings.
Parameters	<p><portlist> – Specifies a range of ports. The port list is specified by listing the lowest slot number and the beginning port number on that slot, separated by a colon. Then the highest slot number, and the highest port number of the range (also separated by a colon) are specified. The beginning and end of the port list range are separated by a dash. For example, 1:3 specifies slot number 1, port 3. 2:4 specifies slot number 2, port 4. 1:3-2:4 specifies all of the ports between slot 1, port 3 and slot 2, port 4 – in numerical order.</p> <p>all – Specifies all of the ports on the switch.</p> <p>default – Returns all of the ports in the specified range to their 802.1x default settings.</p> <p>direction [both in] – Determines whether a controlled port blocks communication in both the receiving and transmitting directions, or just the receiving direction.</p>

config 802.1x auth_parameter

port_control – Configures the administrative control over the authentication process for the range of ports.

force_auth – Forces the Authenticator for the port to become authorized. Network access is allowed.

auto – Allows the port's status to reflect the outcome of the authentication process.

force_unauth – Forces the Authenticator for the port to become unauthorized. Network access will be blocked.

quiet_period <sec 0-65535> – Configures the time interval between authentication failure and the start of a new authentication attempt.

tx_period <sec 1-65535> - Configures the time to wait for a response from a supplicant (user) to send EAP Request/Identity packets.

supp_timeout <sec 1-65535> - Configures the time to wait for a response from a supplicant (user) for all EAP packets, except for the Request/Identity packets.

server_timeout <sec 1-65535> - Configure the length of time to wait for a response from a Radius server.

max_req <value 1-10> – Configures the number of times to retry sending packets to a supplicant (user).

reauth_period <sec 1-65535> – Configures the time interval between successive re-authentications.

enable_reauth [enable|disable] – Determines whether or not the switch will re-authenticate. Enabled causes re-authentication of users at the time interval specified in the Re-authentication Period field, above.

Restrictions

Only administrator-level users can issue this command.

Example usage:

To configure 802.1x authentication parameters for ports 1 – 20 of switch 1:

```
DES-6500:4#config 802.1x auth_parameter ports 1:1 – 1:12  
direction both
```

```
Command: config 802.1x auth_parameter ports 1:1 – 1:12  
direction both
```

```
Success.
```

```
DES-6500:4#
```

config 802.1x auth_protocol

Purpose	Used to configure the 802.1x authentication protocol on the switch.
Syntax	config 802.1x auth_protocol [local radius_eap]
Description	The config 802.1x auth_protocol command enables you to configure the authentication protocol.
Parameters	Local radius_eap – Specify the type of authentication protocol desired.
Restrictions	Only administrator-level users can issue this command.

Example usage:

To configure the authentication protocol on the switch:

```
DES-6500:4# config 802.1x auth_protocol local
Command: config 802.1x auth_protocol local

Success.

DES-6500:4#
```

config 802.1x init

Purpose	Used to initialize the 802.1x function on a range of ports or a list of MAC addresses.
Syntax	config 802.1x init [port_based ports [<portlist all>]
Description	The config 802.1x init command is used to immediately initialize the 802.1x functions on a specified range of ports or for specified MAC addresses operating from a specified range of ports.
Parameters	<p>port_based – This instructs the switch to initialize 802.1x functions based only on the port number. Ports approved for initialization can then be specified.</p> <p><portlist> – Specifies a range of ports. The port list is specified by listing the lowest slot number and the beginning port number on that slot, separated by a colon. Then the highest slot number, and the highest port number of the range (also separated by a colon) are specified. The beginning and end of the port list range are separated by a dash. For example, 1:3 specifies slot number 1, port 3. 2:4 specifies slot number 2, port 4. 1:3-2:4 specifies all of the ports between slot 1, port 3 and slot 2, port 4 – in numerical order.</p> <p>all – Specifies all of the ports on the switch.</p>
Restrictions	Only administrator-level users can issue this command.

Example usage:

To initialize the authentication state machine of some or all:

```
DES-6500:4# config 802.1x init port_based ports all
Command: config 802.1x init port_based ports all

Success.

DES-6500:4#
```

config 802.1x reauth ports	
Purpose	Used to configure the 802.1x re-authentication feature of the switch.
Syntax	config 802.1x reauth [port_based ports [<portlist all>]
Description	The config 802.1x reauth command is used to re-authenticate a previously authenticated device based on port number.
Parameters	<p>port_based – This instructs the switch to re-authorize 802.1x function based only on the port number. Ports approved for re-authorization can then be specified.</p> <p>ports <portlist> – Specifies a range of ports. The port list is specified by listing the lowest slot number and the beginning port number on that slot, separated by a colon. Then the highest slot number, and the highest port number of the range (also separated by a colon) are specified. The beginning and end of the port list range are separated by a dash. For example, 1:3 specifies slot number 1, port 3. 2:4 specifies slot number 2, port 4. 1:3-2:4 specifies all of the ports between slot 1, port 3 and slot 2, port 4 – in numerical order.</p> <p>all – Specifies all of the ports on the switch.</p>
Restrictions	Only administrator-level users can issue this command.

Example usage:

To configure 802.1x reauthentication for ports 1-18:

```
DES-6500:4#config 802.1x reauth port_based ports 1:1-1:10
Command: config 802.1x reauth port_based ports 1:1-1:10

Success.

DES-6500:4#
```


config radius add

Purpose	Used to configure the settings the switch will use to communicate with a RADIUS server.
Syntax	config radius add <server_index 1-3> <server_ip> key <passwd 32> [default {auth_port <udp_port_number 1-65535> acct_port <udp_port_number 1-65535>}]
Description	The config radius add command is used to configure the settings the switch will use to communicate with a RADIUS server.
Parameters	<p><server_index 1-3> – Assigns a number to the current set of RADIUS server settings. Up to 3 groups of RADIUS server settings can be entered on the switch.</p> <p><server_ip> – The IP address of the RADIUS server.</p> <p>key – Specifies that a password and encryption key will be used between the switch and the Radius server.</p> <p><passwd 32> – The shared-secret key used by the RADIUS server and the switch. Up to 32 characters can be used.</p> <p>default – Uses the default udp port number in both the “auth_port” and “acct_port” settings.</p> <p>auth_port <udp_port_number 1-65535> – The UDP port number for authentication requests. The default is 1812.</p> <p>acct_port <udp_port_number 1-65535> – The UDP port number for accounting requests. The default is 1813.</p>
Restrictions	Only administrator-level users can issue this command.

Example usage:

To configure the RADIUS server communication settings:

```
DES-6500:4#config radius add 1 10.48.74.121 key dlink default
Command: config radius add 1 10.48.74.121 key dlink default

Success.

DES-6500:4#
```

config radius delete

Purpose	Used to delete a previously entered RADIUS server configuration.
Syntax	config radius delete <server_index 1-3>
Description	The config radius delete command is used to delete a previously entered RADIUS server configuration.
Parameters	<server_index 1-3> – Assigns a number to the current set of RADIUS server settings. Up to 3 groups of RADIUS server settings can be entered on the switch.
Restrictions	Only administrator-level users can issue this command.

Example usage:

To delete previously configured RADIUS server communication settings:

```
DES-6500:4#config radius delete 1
```

```
Command: config radius delete 1
```

```
Success.
```

```
DES-6500:4#
```

config radius

Purpose	Used to configure the switch's RADIUS settings.
Syntax	config radius <server_index 1-3> {ipaddress <server_ip> {ipaddress <server_ip> key <passwd 32> auth_port <udp_port_number 1-65535> acct_port <udp_port_number 1-65535>}}
Description	The config radius command is used to configure the switch's Radius settings.
Parameters	<server_index 1-3> – Assigns a number to the current set of RADIUS server settings. Up to 3 groups of RADIUS server settings can be entered on the switch. <server_ip> – The IP address of the Radius server. key – Specifies that a password and encryption key will be used between the switch and the RADIUS server. <passwd 32> – The shared-secret key used by the RADIUS server and the switch. Up to 32 characters can be used. default – Uses the default udp port number in both the "auth_port" and "acct_port" settings.

config radius

auth_port <udp_port_number 1-65535> – The UDP port number for authentication requests. The default is 1812.

acct_port <udp_port_number 1-65535> – The UDP port number for accounting requests. The default is 1813.

Restrictions

Only administrator-level users can issue this command.

Example usage:

To configure the RADIUS settings:

```
DES-6500:4#config radius 1 10.48.74.121 key dlink default  
Command: config radius 1 10.48.74.121 key dlink default
```

```
Success.
```

```
DES-6500:4#
```

show radius

Purpose	Used to display the current RADIUS configurations on the switch.
Syntax	show radius
Description	The show radius command is used to display the current RADIUS configurations on the switch.
Parameters	None.
Restrictions	None.

Example usage:

To display RADIUS settings on th switch:

DES-6500:4#show radius

Command: show radius

Index	IP Address	Auth-Port Number	Acct-Port Number	Status	Key
1	10.1.1.1	1812	1813	Active	switch
2	20.1.1.1	1800	1813	Active	des3226
3	30.1.1.1	1812	1813	Active	dlink

Total Entries : 3

DES-6500:4#

show acct_client

Purpose	Used to display the current RADIUS accounting client.
Syntax	show acct_client
Description	The show acct_client command is used to display the current RADIUS accounting client currently configured on the switch.
Parameters	None.
Restrictions	None.

Example usage:

To view the current RADIUS accounting client:

```

DES-6500:4#show acct_client
Command: show acct_client

radiusAcctClient ==>
radiusAcctClientIdentifier      D-Link

radiusAuthServerEntry ==>
radiusAccServerIndex : 1

radiusAccServerAddress          10.53.13.199
radiusAccClientServerPortNumber 32
radiusAccClientRoundTripTime    0
radiusAccClientRequests         0
radiusAccClientRetransmissions  0
radiusAccClientResponses        0
radiusAccClientMalformedResponses 0
radiusAccClientBadAuthenticators 0
radiusAccClientPendingRequests  0
radiusAccClientTimeouts         0
radiusAccClientUnknownTypes     0
radiusAccClientPacketsDropped   0

CTRL+C ESC q Quit SPACE n Next Page Enter Next Entry a All

```

show auth_client	
Purpose	Used to display the current RADIUS authentication client.
Syntax	show auth_client
Description	The show auth_client command is used to display the current RADIUS authentication client currently configured on the switch.
Parameters	None.
Restrictions	None.

Example usage:

To view the current RADIUS authentication client:

```
DES-6500:4#show radius auth_client
```

```
Command: show radius auth_client
```

```
radiusAuthClient ==>
```

```
radiusAuthClientInvalidServerAddresses 0
```

```
radiusAuthClientIdentifier      D-Link
```

```
radiusAuthServerEntry ==>
```

```
radiusAuthServerIndex :1
```

```
radiusAuthServerAddress      10.53.13.199
```

```
radiusAuthClientServerPortNumber      25
```

```
radiusAuthClientRoundTripTime      0
```

```
radiusAuthClientAccessRequests      0
```

```
radiusAuthClientAccessRetransmissions 0
```

```
radiusAuthClientAccessAccepts      0
```

```
radiusAuthClientAccessRejects      0
```

```
radiusAuthClientAccessChallenges    0
```

```
radiusAuthClientMalformedAccessResponses 0
```

```
radiusAuthClientBadAuthenticators    0
```

```
radiusAuthClientPendingRequests      0
```

```
radiusAuthClientTimeouts            0
```

```
radiusAuthClientUnknownTypes        0
```

```
radiusAuthClientPacketsDropped      0
```

```
CTRL+C ESC q Quit SPACE n Next Page Enter Next Entry a All
```

show auth_diagnostics

Purpose Used to display the current authentication diagnostics.

Syntax **show auth_diagnostics {ports [<portlist>|all]}**

Description The show auth_diagnostics command is used to display the current authentication diagnostics of the switch on a per port basis.

Parameters ports <portlist> – Specifies a range of ports. The port list is specified by listing the lowest slot number and the beginning port number on that slot, separated by a colon. Then the highest slot number, and the highest port number of the range (also separated by a colon) are specified. The beginning and end of the port list range are separated by a dash. For example, 1:3 specifies slot number 1, port 3. 2:4 specifies slot number 2, port 4. 1:3-2:4 specifies all of the ports between slot 1, port 3 and slot 2, port 4 – in numerical order.

all – displays all of the ports on the switch.

Restrictions None.

Example usage:

To display the current authentication diagnostics for port 16:

```
DES-6500:4#show auth_diagnostics ports 16
Command: show auth_diagnostics ports 1:16

Port number : 1:16

EntersConnecting                0
EapLogoffsWhileConnecting      0
EntersAuthenticating           0
SuccessWhileAuthenticating     0
TimeoutsWhileAuthenticating    0
FailWhileAuthenticating        0
ReauthsWhileAuthenticating     0
EapStartsWhileAuthenticating   0
EapLogoffWhileAuthenticating   0
ReauthsWhileAuthenticated     0
EapStartsWhileAuthenticated    0
EapLogoffWhileAuthenticated    0
BackendResponses               0
BackendAccessChallenges        0
BackendOtherRequestsToSupplicant 0
BackendNonNakResponsesFromSupplicant 0
BackendAuthSuccesses           0
BackendAuthFails               0

CTRL+C ESC q Quit SPACE n Next Page Enter Next Entry a All
```

show auth_session statistics

Purpose	Used to display the current authentication session statistics.
Syntax	show auth_session statistics {ports [<portlist> all]}
Description	The show auth_session statistics command is used to display the current authentication session statistics of the switch on a per port basis.
Parameters	ports <portlist> – Specifies a range of ports. The port list is specified by listing the lowest slot number and the beginning port number on that slot, separated by a colon. Then the highest slot number, and the highest port number of the range (also separated by a colon) are specified. The beginning and end of the port list range are separated by a dash. For example, 1:3 specifies slot number 1, port 3. 2:4 specifies

show auth_session statistics

slot number 2, port 4. 1:3-2:4 specifies all of the ports between slot 1, port 3 and slot 2, port 4 – in numerical order.

all – displays all of the ports on the switch.

Restrictions

None.

Example usage:

To display the current authentication session statistics for port 16:

```
DES-6500:4#show auth_session_statistics ports 12
```

```
Command: show auth_session_statistics ports 1:12
```

```
Port number : 1:12
```

```
SessionOctetsRx          0
SessionOctetsTx          0
SessionFramesRx          0
SessionFramesTx          0
SessionId
SessionAuthenticMethod   Remote Authentication Server
SessionTime              0
SessionTerminateCause    SupplicantLogoff
SessionUserName
```

```
CTRL+C ESC q Quit SPACE n Next Page Enter Next Entry a All
```

show auth_statistics

Purpose Used to display the current authentication statistics.

Syntax **show auth_statistics {ports [<portlist>|all]}**

Description The show auth_statistics command is used to display the current authentication statistics of the switch on a per port basis.

Parameters ports <portlist> – Specifies a range of ports. The port list is specified by listing the lowest switch number and the beginning port number on that switch, separated by a colon. Then highest switch number, and the highest port number of the range (also separated by a colon) are specified. The beginning and end of the port list range are separated by a dash. For example, 3 would specify port 3. 4 specifies port 4. 3-4 specifies all of the ports between port 3 and port 4 – in numerical order.

all – displays all of the ports on the switch.

Restrictions

None.

Example usage:

To display the current authentication statistics for port 16:

```
DES-6500:4#show auth_statistics ports 1:11
Command: show auth_statistics ports 1:11

Port number : 1:11

EapolFramesRx           0
EapolFramesTx           0
EapolStartFramesRx      0
EapolReqIdFramesTx      0
EapolLogoffFramesRx     0
EapolReqFramesTx        0
EapolRespIdFramesRx     0
EapolRespFramesRx       0
InvalidEapolFramesRx    0
EapLengthErrorFramesRx  0

LastEapolFrameVersion   0
LastEapolFrameSource    00-00-00-00-00-00

CTRL+C ESC q Quit SPACE n Next Page Enter Next Entry a All
```

ACCESS CONTROL LIST (ACL) COMMANDS

The DES-6500 implements Access Control Lists that enable the switch to deny network access to specific devices or device groups based on IP settings or MAC address.

Command	Parameters
create access_profile	[ethernet{ vlan source_mac <macmask> destination_mac <macmask> 802.1p ethernet_type} ip { vlan source_ip_mask <netmask> destination_ip_mask <netmask> dscp [icmp {type code } igmp {type } tcp {src_port_mask <hex 0x0-0xffff> dst_port_mask <hex 0x0-0xffff> flag_mask [all {urg ack psh rst syn fin} udp {src_port_mask <hex 0x0-0xffff> dst_port_mask <hex 0x0-0xffff> protocol_id {user_mask <hex 0x0-0xfffffff> }] } {port portlist} all}] profile_id <value 1-8>
delete access_profile	profile_id <value 1-8>
config access_profile	<value 1-8>[add access_id <value 1 50>[ethernet { vlan <vlan_name 32> source_mac <macaddr> destination_mac <macaddr> 802.1p <value 0-7> ethernet_type <hex 0x0-0xffff> } ip{ vlan <vlan_name 32> source_ip <ipaddr> destination_ip <ipaddr> dscp <value 0-63> [icmp {type <value 0-255> code <value 0-255>} igmp {type <value 0-255>} tcp{src_port <value 0-65535> dst_port <value 0-65535>} udp {src_port <value 0-65535> dst_port <value 0-65535>} protocol_id <value 0 - 255> {user_define <hex 0x0-0xfffffff>}}][permit {priority <value 0-7> { replace_priority } replace_dscp <value 0-63> deny } delete <value 1-50>]
show access_profile	{profile_id <value 1-8>}

Due to a chipset limitation, the switch currently supports a maximum of 8 access profiles, each containing a maximum of 50 rules – with the additional limitation of 50 rules total for all 8 access profiles.

Access profiles allow you to establish criteria to determine whether or not the switch will forward packets based on the information contained in each packet's header. These criteria can be specified on a VLAN-by-VLAN basis.

Creating an access profile is divided into two basic parts. First, an access profile must be created using the **create access_profile** command. For example, if you want to deny all traffic to the subnet 10.42.73.0 to 10.42.73.255, you must first **create** an access profile that instructs the switch to examine all of the relevant fields of each frame:

```
create access_profile ip source_ip_mask 255.255.255.0 profile_id 1
```

Here we have created an access profile that will examine the IP field of each frame received by the switch. Each source IP address the switch finds will be combined with the **source_ip_mask** with a logical AND operation. The **profile_id** parameter is used to give the access profile an identifying number – in this case, **1**. The **deny** parameter instructs the switch to filter any frames that meet the criteria – in this case, when a logical AND operation between an IP address specified in the next step and the **ip_source_mask** match.

The default for an access profile on the switch is to **permit** traffic flow. If you want to restrict traffic, you must use the **deny** parameter.

Now that an access profile has been created, you must add the criteria the switch will use to decide if a given frame should be forwarded or filtered. Here, we want to filter any packets that have an IP source address between 10.42.73.0 and 10.42.73.255:

```
config access_profile profile_id 1 add access_id 1 ip source_ip 10.42.73.1 deny
```

Here we use the **profile_id 1** which was specified when the access profile was created. The **add** parameter instructs the switch to add the criteria that follows to the list of rules that are associated with access profile 1. For each rule entered into the access profile, you can assign an **access_id** that both identifies the rule and establishes a priority within the list of rules. A lower **access_id** gives the rule a higher priority. In case of a conflict in the rules entered for an access profile, the rule with the highest priority (lowest **access_id**) will take precedence.

The **ip** parameter instructs the switch that this new rule will be applied to the IP addresses contained within each frame's header. **source_ip** tells the switch that this rule will apply to the source IP addresses in each frame's header. Finally, the IP address **10.42.73.1** will be combined with the **source_ip_mask 255.255.255.0** to give the IP address 10.42.73.0 for any source IP address between 10.42.73.0 to 10.42.73.255.

create access_profile

Purpose Used to create an access profile on the switch and to define which parts of each incoming frame's header the switch will examine. Masks can be entered that will be combined with the values the switch finds in the specified frame header fields. Specific values for the rules are entered using the **config access_profile** command, below.

Syntax

```
create access_profile [ethernet{ vlan | source_mac <macmask> | destination_mac <macmask> | 802.1p | ethernet_type} | ip { vlan | source_ip_mask <netmask> | destination_ip_mask <netmask> | dscp | [ icmp {type | code } | igmp {type } | tcp {src_port_mask <hex 0x0-0xffff> | dst_port_mask <hex 0x0-0xffff> | flag_mask [ all | {urg | ack | psh | rst | syn | fin} | udp {src_port_mask <hex 0x0-0xffff> | dst_port_mask <hex 0x0-0xffff> | protocol_id {user_mask <hex 0x0-0xffffffff> } ] } {<port portlist> | all}] profile_id <value 1-8>
```

Description The **create access_profile** command is used to create an access profile on the switch and to define which parts of each incoming frame's header the switch will examine. Masks can be entered that will be combined with the values the switch finds in the specified frame header fields. Specific values for the rules are entered using the **config access_profile** command, below.

Parameters ethernet – Specifies that the switch will examine the layer 2 part of each packet header.

vlan – Specifies that the switch will examine the VLAN part of each packet header.

source_mac <macmask> – Specifies a MAC address mask for the source MAC address. This mask is entered in the following hexadecimal format:

destination_mac <macmask> – Specifies a MAC address mask for the destination MAC address.

802.1p – Specifies that the switch will examine the 802.1p priority value in the frame's header.

ethernet_type – Specifies that the switch will examine the Ethernet type value in each frame's header.

ip – Specifies that the switch will examine the IP address in each frame's header.

vlan – Specifies a VLAN mask.

source_ip_mask <netmask> – Specifies an IP address mask for the source IP address.

destination_ip_mask <netmask> – Specifies an IP address mask for the

create access_profile

destination IP address.

dscp – Specifies that the switch will examine the DiffServ Code Point (DSCP) field in each frame's header.

icmp – Specifies that the switch will examine the Internet Control Message Protocol (ICMP) field in each frame's header.

type – Specifies that the switch will examine each frame's ICMP Type field.

code – Specifies that the switch will examine each frame's ICMP Code field.

igmp – Specifies that the switch will examine each frame's Internet Group Management Protocol (IGMP) field.

type – Specifies that the switch will examine each frame's IGMP Type field.

tcp – Specifies that the switch will examine each frames Transport Control Protocol (TCP) field.

src_port_mask <hex 0x0-0xffff> – Specifies a TCP port mask for the source port.

dst_port_mask <hex 0x0-0xffff> – Specifies a TCP port mask for the destination port.

flag_mask [all | {urg | ack | psh | rst | syn | fin}] – Enter the appropriate flag_mask parameter. All incoming packets have TCP port numbers contained in them as the forwarding criterion. These numbers have flag bits associated with them which are parts of a packet that determine what to do with the packet. The user may deny packets by denying certain flag bits within the packets. The user may choose between all, urg (urgent), ack (acknowledgement), psh (push), rst (reset), syn (synchronize) and fin (finish).

udp – Specifies that the switch will examine each frame's Universal Datagram Protocol (UDP) field.

src_port_mask <hex 0x0-0xffff> – Specifies a UDP port mask for the source port.

dst_port_mask <hex 0x0-0xffff> – Specifies a UDP port mask for the destination port.

protocol_id – Specifies that the switch will examine each frame's Protocol ID field.

user_mask <hex 0x0-0xffffffff> – Specifies that the rule applies to the IP protocol ID and the mask options behind the IP header.

port<*portlist*> - Specifies a port or range of ports to be configured.

all – denotes all ports on the switch.

profile_id <value 1-8> – Specifies an index number that will identify the

create access_profile

access profile being created with this command.

Restrictions

Only administrator-level users can issue this command.

Example usage:

To create an access profile that will deny service to the subnet ranging from 10.42.73.0 to 10.42.73.255:

```
DES6500:4#create access_profile ip source_ip_mask  
255.255.255.0 profile_id 1  
Command: create access_profile ip source_ip_mask  
255.255.255.0 profile_id 1  
  
Success.  
  
DES-6500:4#
```

delete access_profile

Purpose

Used to delete a previously created access profile.

Syntax

delete access_profile [profile_id <value 1-8>]

Description

The **delete access_profile** command is used to delete a previously created access profile on the switch.

Parameters

profile_id <value 1-8> – an integer between 1 and 8 that is used to identify the access profile that will be deleted with this command. This value is assigned to the access profile when it is created with the **create access_profile** command.

Restrictions

Only administrator-level users can issue this command.

Example usage:

To delete the access profile with a profile ID of 1:

```
DES-6500:4# delete access_profile profile_id 1  
Command: delete access_profile profile_id 1  
  
Success.  
  
DES-6500:4#
```

config access_profile

Purpose	Used to configure an access profile on the switch and to define specific values that will be used to by the switch to determine if a given packet should be forwarded or filtered. Masks entered using the create access_profile command will be combined, using a logical AND operation, with the values the switch finds in the specified frame header fields. Specific values for the rules are entered using the config access_profile command, below.
Syntax	<pre>config access_profile profile_id <value 1-8>[add access_id <value 1 50>[ethernet { vlan <vlan_name 32> source_mac <macaddr> destination_mac <macaddr> 802.1p <value 0-7> ethernet_type <hex 0x0-0xffff> } ip{ vlan <vlan_name 32> source_ip <ipaddr> destination_ip <ipaddr> dscp <value 0-63> [icmp {type <value 0-255>} tcp{src_port <value 0-65535> dst_port <value 0-65535>} udp {src_port <value 0-65535> dst_port <value 0-65535>} protocol_id <value 0 - 255> {user_define <hex 0x0-0xffffffff>}}][permit {priority <value 0-7> { replace_priority} replace_dscp <value 0-63> deny } delete <value 1-50>]</pre>
Description	The config access_profile command is used to configure an access profile on the switch and to enter specific values that will be combined, using a logical AND operation, with masks entered with the create access_profile command, above.
Parameters	<p>profile_id <value 1-8> – an integer between 1 and 8 that is used to identify the access profile that will be associated with this command. This value is assigned to the access profile when it is created with the create access_profile command.</p> <p>add access_id <value 1-50> – Adds an additional rule to the above specified access profile. The value specifies the relative priority of the additional rule. The lower access ID, the higher the priority the rule will be given.</p> <p>ethernet – Specifies that the switch will look only into the layer 2 part of each packet.</p> <p>vlan <vlan_name 32> – Specifies that the access profile will apply to only to this VLAN.</p> <p>source_mac <macaddr> – Specifies that the access profile will apply to only packets with this source MAC address.</p> <p>destination_mac <macaddr> – Specifies that the access profile will apply to only packets with this destination MAC address.</p> <p>802.1p <value 0-7> – Specifies that the access profile will apply only to packets with this 802.1p priority value.</p> <p>ethernet_type <hex 0x0-0xffff> – Specifies that the access profile will apply only to packets with this hexadecimal 802.1Q Ethernet type value in the packet header.</p> <p>ip – Specifies that the switch will look into the IP fields in each packet.</p>

config access_profile

vlan <vlan_name 32> – Specifies that the access profile will apply to only to this VLAN.

source_ip <ipaddr> – Specifies that the access profile will apply to only packets with this source IP address.

destination_ip <value 0-255> – Specifies that the access profile will apply to only packets with this destination IP address.

dscp <value 0-63> – Specifies that the access profile will apply only to packets that have this value in their Type-of-Service (DiffServ code point, DSCP) field in their IP packet header.

icmp – Specifies that the switch will examine the Internet Control Message Protocol (ICMP) field within each packet.

type <value 0-65535> – Specifies that the access profile will apply to this ICMP type value.

code <value 0-255> – Specifies that the access profile will apply to this ICMP code.

igmp – Specifies that the switch will examine the Internet Group Management Protocol (IGMP) field within each packet.

type <value 0-255> – Specifies that the access profile will apply to packets that have this IGMP type value.

tcp – Specifies that the switch will examine the Transmission Control Protocol (TCP) field within each packet.

src_port <value 0-65535> – Specifies that the access profile will apply only to packets that have this TCP source port in their TCP header.

dst_port <value 0-65535> – Specifies that the access profile will apply only to packets that have this TCP destination port in their TCP header.

udp – Specifies that the switch will examine the Universal Datagram Protocol (UDP) field in each packet.

src_port <value 0-65535> – Specifies that the access profile will apply only to packets that have this UDP source port in their header.

dst_port <value 0-65535> – Specifies that the access profile will apply only to packets that have this UDP destination port in their header.

protocol_id <value 0-255> – Specifies that the switch will examine the Protocol field in each packet and if this field contains the value entered here, apply the following rules.

user_define <hex 0x0-0xffffffff> – Specifies a mask to be combined with the value found in the frame header using a logical AND operation.

deny – Specifies that packets that do not match the access profile are not permitted to be forwarded by the switch and will be filtered.

permit – Specifies that packets that match the access profile are

config access_profile

permitted to be forwarded by the switch.

- **priority <value 0-7>** – Specifies that the access profile will apply to packets that contain this value in their 802.1p priority field of their header.
- **replace_priority** – This parameter is specified if you want to change the 802.1p user priority of a packet that meets the specified criteria. Otherwise, a packet will have its incoming 802.1p user priority re-written to its original value before being transmitted from the switch.
- **replace_dscp <value 0-63>** – Allows you to specify a value to be written to the DSCP field of an incoming packet that meets the criteria specified in the first part of the command. This value will over-write the value in the DSCP field of the packet.

delete <value 1-50> – Specifies the access ID of a rule you want to delete.

Restrictions

Only administrator-level users can issue this command.

Example usage:

To configure the access profile with the profile ID of 1 to filter frames that have IP addresses in the range between 10.42.73.0 to 10.42.73.255:

```
DES6500:4#config access_profile profile_id 1 add access_id 1  
ip source_ip 10.42.
```

```
73.1 deny
```

```
Command: config access_profile profile_id 1 add access_id 1  
ip source_ip 10.42.7
```

```
3.1 deny
```

```
Success.
```

```
DES-6500:4#
```

show access_profile

Purpose	Used to display the currently configured access profiles on the switch.
Syntax	show access_profile
Description	The show access_profile command is used to display the currently configured access profiles
Parameters	None.
Restrictions	Only administrator-level users can issue this command.

Example usage:

To display all of the currently configured access profiles on the switch:

```
DES-6500:4#show access_profile
Command: show access_profile

Access Profile Table

Access Profile ID:100                Mode : Permit
                                   TYPE : Ethernet
=====
=
MASK Option  VLAN      Source MAC      Destination MAC 802.1p Ethernet
              00-00-00-00-00-01 00-00-00-00-00-02
-----

Access ID
-----
1 (248) default 00-00-00-00-00-00 00-00-00-00-00-00 0 0x800
=====
=

Access Profile ID:101                Mode : Permit
                                   TYPE : IP
=====
=
MASK Option  VLAN      Source IP MASK  Dst. IP MASK  DSCP ICMP TYPE CODE
              20.0.0.0    10.0.0.0
-----

Access ID
-----
1 (249) 0      0.0.0.0    0.0.0.0    1 5 7
=====
=

Total Entries : 2

DES-6500:4#
```

TRAFFIC SEGMENTATION COMMANDS

Traffic segmentation allows you to further sub-divide VLANs into smaller groups of ports that will help to reduce traffic on the VLAN. The VLAN rules take precedence, and then the traffic segmentation rules are applied.

Command	Parameters
config traffic_segmentation	[<portlist> all] forward_list [null all] <portlist>]
show traffic_segmentation	<portlist>

config traffic_segmentation

Purpose	Used to configure traffic segmentation on the switch.
Syntax	config traffic_segmentation [<portlist> all] forward_list [null all <portlist>]
Description	The config traffic_segmentation command is used to configure traffic segmentation on the switch.
Parameters	<p><portlist> – Specifies a range of ports that will be configured for traffic segmentation. The port list is specified by listing the lowest slot number and the beginning port number on that slot, separated by a colon. Then the highest slot number, and the highest port number of the range (also separated by a colon) are specified. The beginning and end of the port list range are separated by a dash. For example, 1:3 specifies slot number 1, port 3. 2:4 specifies slot number 2, port 4. 1:3-2:4 specifies all of the ports between slot 1, port 3 and slot 2, port 4 – in numerical order.</p> <p>forward_list – Specifies a range of ports that will receive forwarded frames from the ports specified in the portlist, above.</p> <p>null – no ports are specified</p> <p><portlist> – Specifies a range of ports for the forwarding list. This list must be on the same switch previously specified for traffic segmentation (i.e. following the <portlist> specified above for config traffic_segmentation). The port list is specified by listing the lowest slot number and the beginning port number on that slot, separated by a colon. Then the highest slot number, and the highest port number of the range (also separated by a colon) are specified. The beginning and end of the port list range are separated by a dash. For example, 1:3 specifies slot number 1, port 3. 2:4 specifies slot number 2, port 4. 1:3-2:4 specifies all of the ports between slot 1, port 3 and slot 2, port 4 – in numerical order.</p> <p>all – Specifies that all of the ports on the switch will be in the forwarding list.</p>
Restrictions	Only administrator-level users can issue this command.

Example usage:

To configure ports 1 through 10 to be able to forward frames to port 11 through 15:

```
DES-6500:4# config traffic_segmentation 1-10 forward_list 11-15
Command: config traffic_segmentation 1-10 forward_list 11-15

Success.

DES-6500:4#
```

show traffic_segmentation

Purpose	Used to display the current traffic segmentation configuration on the switch.
Syntax	show traffic_segmentation {<portlist>}
Description	The show traffic_segmentation command is used to display the current traffic segmentation configuration on the switch.
Parameters	<portlist> – Specifies a range of ports for which the current traffic segmentation configuration on the switch will be displayed. The port list is specified by listing the lowest slot number and the beginning port number on that slot, separated by a colon. Then the highest slot number, and the highest port number of the range (also separated by a colon) are specified. The beginning and end of the port list range are separated by a dash. For example, 1:3 specifies slot number 1, port 3. 2:4 specifies slot number 2, port 4. 1:3-2:4 specifies all of the ports between slot 1, port 3 and slot 2, port 4 – in numerical order.
Restrictions	The port lists for segmentation and the forward list must be on the same switch.

Example usage:

To display the current traffic segmentation configuration on the switch.

DES-6500:4#show traffic_segmentation

Command: show traffic_segmentation

Traffic Segmentation Table

Port	Forward Portlist
1:1	1:1-1:12,2:1-2:12
1:2	1:1-1:12,2:1-2:12
1:3	1:1-1:12,2:1-2:12
1:4	1:1-1:12,2:1-2:12
1:5	1:1-1:12,2:1-2:12
1:6	1:1-1:12,2:1-2:12
1:7	1:1-1:12,2:1-2:12
1:8	1:1-1:12,2:1-2:12
1:9	1:1-1:12,2:1-2:12
1:10	1:1-1:12,2:1-2:12
1:11	1:1-1:12,2:1-2:12
1:12	1:1-1:12,2:1-2:12
2:1	1:1-1:12,2:1-2:12
2:2	1:1-1:12,2:1-2:12
2:3	1:1-1:12,2:1-2:12
2:4	1:1-1:12,2:1-2:12
2:5	1:1-1:12,2:1-2:12
2:6	1:1-1:12,2:1-2:12

CTRL+C **ESC** **q** Quit **SPACE** **n** Next Page **Enter** Next Entry **a** All

TIME AND SNTP COMMANDS

The Simple Network Time Protocol (SNTP) (an adaptation of the Network Time Protocol (NTP)) commands in the Command Line Interface (CLI) are listed (along with the appropriate parameters) in the following table.

Command	Parameters
config sntp	{primary <ipaddr> secondary <ipaddr> poll-interval <int 30-99999>}(1)
show sntp	
enable sntp	
disable sntp	
config time	<date ddmmmyyyy > <time hh:mm:ss >
config time-zone	{operator [+ -] hour <gmt_hour 0-13> min <minute 0-59>}
config dst	[disable]repeating {s-week<start_week 1-4,last> s-day <start_day sun-sat> s-mth <start_mth 1-12> s-time <start_time hh:mm> e-week <end_week 1-4,last> e-day <end_day sun-sat> e-mth <end_mth 1-12> e-time <end_time hh:mm> offset [30 60 90 120]} annual {s-date <start_date 1-31> s-mth <start_mth 1-12> s-time <start_time hh:mm> e-date <end_date 1-31> e-mth <end_mth 1-12> e-time <end_time hh:mm> offset [30 60 90 120]}}
show time	

Each command is listed, in detail, in the following sections.

config sntp

Purpose	Used to setup SNTP service.
Syntax	config sntp {primary <ipaddr> secondary <ipaddr> poll-interval <int 30-99999>}
Description	Use this command to configure SNTP service from an SNTP server. SNTP must be enabled for this command to function (See enable sntp).
Parameters	<p>primary – This is the primary server the SNTP information will be taken from.</p> <p><ipaddr> – The IP address of the primary server.</p> <p>secondary – This is the secondary server the SNTP information will be taken from in the event the primary server is unavailable.</p> <p><ipaddr> – The IP address for the secondary server.</p>

config sntp

poll-interval – This is the interval between requests for updated SNTP information.

<int 30-99999> – The polling interval ranges from 30 to 99,999 seconds.

Restrictions

Only administrator-level users can issue this command. SNTP service must be enabled for this command to function (enable sntp).

Example usage:

To configure SNTP settings:

```
DES-6500:4#config sntp primary 10.1.1.1 secondary 10.1.1.2  
poll-interval 30
```

```
Command: config sntp primary 10.1.1.1 secondary 10.1.1.2  
poll-interval 30
```

Success.

```
DES-6500:4#
```

show sntp

Purpose

Used to display the SNTP information.

Syntax

show sntp

Description

This command will display SNTP settings information including the source IP address, time and poll interval.

Parameters

None.

Restrictions

Only administrator-level users can issue this command.

Example usage:

To display SNTP configuration information:

```

DES-6500:4#show sntp
Command: show sntp

Current Time Source    : System Clock
SNTP                   : Disabled
SNTP Primary Server   : 10.1.1.1
SNTP Secondary Server : 10.1.1.2
SNTP Poll Interval    : 30 sec

DES-6500:4#

```

enable sntp

Purpose	Enables SNTP service support.
Syntax	enable sntp
Description	This will enable SNTP support. SNTP service must be separately configured (see config sntp). Enabling and configuring SNTP support will override any manually configured system time settings.
Parameters	None.
Restrictions	Only administrator-level users can issue this command. SNTP settings must be configured for SNTP to function (config sntp).

Example usage:

To enable the SNTP function:

```

DES-6500:4#enable sntp
Command: enable sntp

Success.

DES-6500:4#

```

disable sntp

Purpose	Disables SNTP service support.
Syntax	disable sntp
Description	This will disable SNTP support. SNTP service must be separately configured (see config sntp).
Parameters	None.

disable sntp

Restrictions Only administrator-level users can issue this command.

Example:

To stop SNTP support:

```
DES-6500:4#disable sntp
```

```
Command: disable sntp
```

```
Success.
```

```
DES-6500:4#
```

config time

Purpose	Used to manually configure system time and date settings.
Syntax	config time date <date ddmthyyy> <time hh:mm:ss>
Description	This will configure the system time and date settings. These will be overridden if SNTP is configured and enabled.
Parameters	<p>date – Express the date using two numerical characters for the day of the month, three alphabetical characters for the name of the month, and four numerical characters for the year. For example: 03aug2003.</p> <p>time – Express the system time using the format hh:mm:ss, that is, two numerical characters each for the hour using a 24-hour clock, the minute and second. For example: 19:42:30.</p>
Restrictions	Only administrator-level users can issue this command. Manually configured system time and date settings are overridden if SNTP support is enabled.

Example usage:

```
DES-6500:4#config time 30jun2003 16:30:30
```

```
Command: config time 30jun2003 16:30:30
```

```
Success.
```

```
DES-6500:4#
```

To manually set system time and date settings:

config time zone

Purpose	Used to determine the time zone used in order to adjust the system clock.
Syntax	config time-zone {operator [+ -] hour <gmt_hour 0-13> min <minute 0-59>}
Description	This will adjust system clock settings according to the time zone. Time zone settings will adjust SNTP information accordingly.
Parameters	operator – Choose to add (+) or subtract (-) time to adjust for time zone relative to GMT. hour – Select the number hours different from GMT. min – Select the number of minutes difference added or subtracted to adjust the time zone.
Restrictions	Only administrator-level users can issue this command.

Example usage:

To configure time zone settings:

```
DES-6500:4#config time_zone operator + hour 2 min 30
```

```
Command: config time_zone operator + hour 2 min 30
```

```
Success.
```

```
DES-6500:4#
```

config dst

Purpose	Used to enable and configure time adjustments to allow for the use of Daylight Savings Time (DST).
Syntax	config dst disable repeating {s-week<start_week 1-4,last> s-day <start_day sun-sat> s-mth <start_mth 1-12> s-time <start_time hh:mm> e-week <end_week 1-4,last>

config dst

```
| e-day <end_day sun-sat>  
| e-mth <end_mth 1-12>  
| e-time <end_time hh:mm>  
| offset [30 | 60|90|120]}  
| annual {s-date <start_date 1-31>  
| s-mth <start_mth 1-12>  
| s-time <start_time hh:mm>  
| e-date <end_date 1-31>  
| e-mth <end_mth 1-12>  
| e-time <end_time hh:mm>  
| offset [30 | 60 | 90 | 120]]}]}
```

Description

DST can be enabled and configured using this command. When enabled this will adjust the system clock to comply with any DST requirement. DST adjustment effects system time for both manually configured time and time set using SNTP service.

Parameters

disable -Disable the DST seasonal time adjustment for the switch.

repeating - Using repeating mode will enable DST seasonal time adjustment. Repeating mode requires that the DST beginning and ending date be specified using a formula. For example, specify to begin DST on Saturday during the second week of April and end DST on Sunday during the last week of October.

annual - Using annual mode will enable DST seasonal time adjustment. Annual mode requires that the DST beginning and ending date be specified concisely. For example, specify to begin DST on April 3 and end DST on October 14.

s-week - Configure the week of the month in which DST begins.

<start_week 1-4,last> - The number of the week during the month in which DST begins where **1** is the first week in the month, **2** is the second week in the month and so on, and **last** is the last week of the month.

e-week - Configure the week of the month in which DST ends.

<end_week 1-4,last> - The number of the week during the month in which DST ends where 1 is the first week of the month month, 2 is the second week of the month and so on, and last is the last week of the month.

s-wday – Configure the day of the week in which DST begins.

<start_weekday sun-sat> - The day of the week in which DST begins expressed using a three character abbreviation (sun, mon, tue, wed,

config dst

thu, fri, sat)

e-wday - Configure the day of the week in which DST ends.

<end_weekday sun-sat> - The day of the week in which DST ends expressed using a three character abbreviation (sun, mon, tue, wed, thu, fri, sat)

s-mth - Configure the month in which DST begins.

<start_mth 1-12> - The month to begin DST expressed as a number.

e-mth - Configure the month in which DST ends.

<end_mth 1-12> - The month to end DST expressed as a number.

s-time - Configure the time of day to begin DST. Time is expressed using a 24-hour clock.

e-time - Configure the time of day to end DST. Time is expressed using a 24-hour clock.

s-date - Configure the specific date (day of the month) to begin DST. The date is expressed numerically.

e-date - Configure the specific date (day of the month) to begin DST. The date is expressed numerically.

offset - Indicates number of minutes to add during the summertime. The range of offset are 30,60,90,120; default value is 60

Restrictions

Only administrator-level users can issue this command.

Example usage:

To configure daylight savings time on the switch:

```
DES-6500:4#config dst repeating s_week 2 s_day tue s_mth 4  
s_time 15:00 e_week 2 e_day wed e_mth 10 e_time 15:30  
offset 30
```

```
Command: config dst repeating s_week 2 s_day tue s_mth 4  
s_time 15:00 e_week 2 e_day wed e_mth 10 e_time 15:30  
offset 30
```

Success.

```
DES-6500:4#
```

show time

Purpose	Used to display the current time settings and status.
Syntax	show time
Description	This will display system time and date configuration as well as display current system time.
Parameters	None.
Restrictions	Only administrator-level users can issue this command.

Example usage:

To show the time currently set on the switch's System clock:

```
DES-6500:4#show time
Command: show time

Current Time Source : System Clock
Boot Time           : 2 Jul 2003 10:59:59
Current Time        : 10 Jul 2003 01:43:41
Time Zone           : GMT +02:30
Daylight Saving Time : Repeating
Offset in Minutes   : 30
  Repeating From    : Apr 2nd Tue 15:00
    To              : Oct 2nd Wed 15:30
  Annual From      : 29 Apr 00:00
    To              : 012 Oct 00:00

DES-6500:4#
```

ARP COMMANDS

The ARP commands in the Command Line Interface (CLI) are listed (along with the appropriate parameters) in the following table.

Command	Parameters
create arprentry	<ipaddr> <macaddr>
delete arprentry	[<ipaddr> all]
show arprentry	ipif <ipif_name 12> ipaddress <ipaddr> static}
config arp_aging	time <value 0-65535>
clear arptable	

Each command is listed, in detail, in the following sections.

create arprentry

Purpose	Used to make a static entry into the ARP table.
Syntax	create arprentry <ipaddr> <macaddr>
Description	This command is used to enter an IP address and the corresponding MAC address into the switch's ARP table.
Parameters	<ipaddr> – The IP address of the end node or station. <macaddr> – The MAC address corresponding to the IP address above.
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To create a static arp entry for the IP address 10.48.74.121 and MAC address 00:50:BA:00:07:36:

```
DES-6500:4#create arprentry 10.48.74.121 00-50-BA-00-07-36
Command: create arprentry 10.48.74.121 00-50-BA-00-07-36

Success.

DES-6500:4#
```

delete arprentry

Purpose	Used to delete a static entry into the ARP table.
Syntax	delete arprentry {<ipaddr> all}
Description	This command is used to delete a static ARP entry, made using the create arprentry command above, by specifying either the IP address of the entry or all. Specifying all clears the switch's ARP table.
Parameters	<ipaddr> – The IP address of the end node or station. all – deletes all ARP entries.
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To delete an entry of IP address 10.48.74.121 from the ARP table:

```
DES-6500:4#delete arprentry 10.48.74.121
Command: delete arprentry 10.48.74.121

Success.

DES-6500:4#
```

config arp_aging

Purpose	Used to configure the age-out timer for ARP table entries on the switch.
Syntax	config arp_aging time <value 0-65535>
Description	This command sets the maximum amount of time, in minutes, that an ARP entry can remain in the switch's ARP table, without being accessed, before it is dropped from the table.
Parameters	time <value> – The ARP age-out time, in minutes. The value may be set in the range of 0-65535 seconds with a default setting of 20 seconds.
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To configure ARP aging time:

```
DES-6500:4#config arp_aging time 30
```

```
Command: config arp_aging time 30
```

```
Success.
```

```
DES-6500:4#
```

show arpentry

Purpose	Used to display the ARP table.
Syntax	show arpentry {ipif <ipif_name> ipaddress <network_address> static}
Description	This command is used to display the current contents of the switch's ARP table.
Parameters	<p><ipif_name> – The name of the IP interface the end node or station for which the ARP table entry was made, resides on.</p> <p><ipaddr> – The network address corresponding to the IP interface name above.</p> <p>static – Displays the static entries to the ARP table.</p>
Restrictions	none.

Example Usage:

To display the ARP table:

```
DES-6500:4#show arpentry
Command: show arpentry
ARP Aging Time : 30

Interface      IP Address      MAC Address      Type
-----
System         10.0.0.0        FF-FF-FF-FF-FF-FF  Local/Broadcast
System         10.1.1.169      00-50-BA-70-E4-4E  Dynamic
System         10.1.1.254      00-01-30-FA-5F-00  Dynamic
System         10.255.255.255  FF-FF-FF-FF-FF-FF  Local/Broadcast

Total Entries = 4

DES-6500:4#
```

clear arptable

Purpose	Used to remove all dynamic ARP table entries.
Syntax	clear arptable
Description	This command is used to remove dynamic ARP table entries from the switch's ARP table. Static ARP table entries are not affected.
Parameters	none.
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To remove dynamic entries in the ARP table:

```
DES-6500:4#clear arptable
Command: clear arptable

Success.

DES-6500:4#
```


ROUTING TABLE COMMANDS

The routing table commands in the Command Line Interface (CLI) are listed (along with the appropriate parameters) in the following table.

Command	Parameters
create iproute	default <network_address> <ipaddr> <metric 1-65535>
delete iproute	default <network_address>
show iproute	<network_address> static rip ospf

Each command is listed, in detail, in the following sections.

create iproute

Purpose	Used to create IP route entries to the switch's IP routing table.
Syntax	create iproute [default <network_address>] <ipaddr> {<metric>}
Description	This command is used to create a primary and backup IP route entry to the switch's IP routing table.
Parameters	<p>default – creates a default IP route entry.</p> <p><network_address> – IP address and netmask of the IP interface that is the destination of the route. You can specify the address and mask information using the traditional format (for example, 10.1.2.3/255.0.0.0 or in CIDR format, 10.1.2.3/8).</p> <p><ipaddr> – The IP address for the next hop router.</p> <p><metric> – The default setting is 1.</p>
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To add a single static address 10.48.74.121 , mask 255.0.0.0 and gateway 10.1.1.254 to the routing table:

```
DES-6500:4#create iproute 10.48.74.121/255.0.0.0 10.1.1.254 1
Command: create iproute 10.48.74.121/8 10.1.1.254 1

Success.

DES-6500:4#
```

delete iproute	
Purpose	Used to delete an IP route entry from the switch's IP routing table.
Syntax	delete iproute [default <network_address>]
Description	This command will delete an existing entry from the switch's IP routing table.
Parameters	default – deletes a default IP route entry. <network_address> – IP address and netmask of the IP interface that is the destination of the route. You can specify the address and mask information using the traditional format (for example, 10.1.2.3/255.0.0.0 or in CIDR format, 10.1.2.3/8).
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To delete a static address 10.48.75.121, mask 255.0.0.0 from the routing table:

```
DES-6500:4#delete iproute 10.48.74.121/255.0.0.0
Command: delete iproute 10.48.74.121/8

Success.

DES-6500:4#
```

show iproute

Purpose	Used to display the switch's current IP routing table.
Syntax	show iproute {<network_address>} {static rip ospf}
Description	This command will display the switch's current IP routing table.
Parameters	<p><network_address> – IP address and netmask of the IP interface that is the destination of the route. You can specify the address and mask information using the traditional format (for example, 10.1.2.3/255.0.0.0 or in CIDR format, 10.1.2.3/8).</p> <p>static – use this to display static iproute entries.</p> <p>rip – use this to display RIP iproute entries.</p> <p>ospf – use this to display OSPF iproute entries.</p>
Restrictions	none.

Example Usage:

To display the contents of the IP routing table:

```
DES-6500:4#show iproute
Command: show iproute
```

IP Address	Netmask	Gateway	Interface	Hops	Protocol
0.0.0.0	0.0.0.0	0.1.1.254	System	1	Default
10.0.0.0	255.0.0.0	10.48.74.122	System	1	Local

```
Total Entries: 2
DES-6500:4#
```

ROUTE REDISTRIBUTION COMMANDS

The Route Redistribution commands in the Command Line Interface (CLI) are listed (along with the appropriate parameters) in the following table.

Command	Parameters
create route redistribute dst ospf	src [static/rip/local] mettype [1/2] metric <value 0-16777214>
create route redistribute dst rip	[local static ospf {all internal external extType1 extType2 inter+e1 inter+e2}] {metric <value 0-16>}
config route redistribute dst ospf	src [static/rip/local] mettype [1/2] metric <value 0-16777214>
config route redistribute dst rip	[local static ospf {all internal external extType1 extType2 inter+e1 inter+e2}] {metric <value 0-16>}
delete route redistribute	dst [rip/ospf] src [local/static/ospf]
show route redistribute	dst [rip/ospf] src [rip/static/local/ospf]

Each command is listed, in detail, in the following sections.

create route redistribute dst ospf

Purpose	Used to add route redistribution settings for the exchange of RIP routes to OSPF routes on the switch.
Syntax	create route redistribute dst ospf src [static rip local] {mettype [1 2]}metric <value 0-16>}
Description	This command will redistribute routing information between the OSPF and RIP routing protocols to all routers on the network that are running OSPF or RIP. Routing information entered into the Static Routing Table on the local DES-6500 switch is also redistributed.
Parameters	<p>src [static/rip/local] – Allows for the selection of the protocol for the source device.</p> <p>mettype [1/2] – Allows for the selection of one of two methods of calculating the metric value. Type-1 calculates (for RIP to OSPF) by adding the destination's interface cost to the metric entered in the Metric field. Type-2 uses the metric entered in the Metric field without change. this field applies only when the destination field is OSPF.</p> <p>metric <value> – Allows the entry of an OSPF interface cost. This is analogous to a Hop Count in the RIP routing protocol.</p>
Restrictions	Only administrator-level users can issue this command.

Routing information source – RIP, the Static Route table, and the Local interface routing information. Routing information will be redistributed to OSPF.

Route Source	Metric	Metric Type
RIP	0 to 16777214	mettype 1 mettype 2
Static	0 to 16777214	mettype 1 mettype 2
Local	0 to 16777214	mettype 1 mettype 2

Allowed Metric Type combinations are **mettype 1** or **mettype 2**. The metric value **0** above will be redistributed in OSPF as the metric **20**.

Example Usage:

To add route redistribution settings:

```
DES-6500:4#create route redistribute dst ospf src rip
Command: create route redistribute dst ospf src rip

Success.

DES-6500:4#
```

create route redistribute dst rip src	
Purpose	Used to add route redistribution settings for the exchange of OSPF routes to RIP routes on the switch.
Syntax	create route redistribute dst rip src {local internal external extType1 extType2 inter+e1 inter+e2}] {metric <value 0-16>}
Description	This command will redistribute routing information between the OSPF and Rip routing protocols to all routers on the network that are running OSPF or RIP. Routing information entered into the Static Routing Table on the local DGS-3324SRi switch is also redistributed
Parameters	src {all internal external extType1 extType2 inter+e1 inter+e2} – Allows the selection of the protocol of the source device. metric <value 0-16> – Allows the entry of an OSPF interface cost. this is analogous to a HOP Count in the RIP routing protocol.
Restrictions	Only administrator-level users can issue this command.

Routing information source – OSPF and the Static Route table. Routing information will be redistributed to RIP. The following table lists the allowed values for the routing metrics and the types (or forms) of the routing information that will be redistributed.

Route Source	Metric	Type
OSPF	0 to 16	all type_1 type_2 internal type_1 internal type_2

		external internal
Static	0 to 16	not applicable

Entering the **Type** combination – **internal type_1 type_2** is functionally equivalent to **all**. Entering the combination **type_1 type_2** is functionally equivalent to **external**. Entering the combination **internal external** is functionally equivalent to **all**.

Entering the metric **0** specifies transparency.

Example Usage:

To add route redistribution settings:

```
DES-6500:4#create route redistribute dst rip src ospf all metric 2
Command: create route redistribute dst rip src ospf all metric 2

Success.

DES-6500:4#
```

delete route redistribute	
Purpose	Used to delete an existing route redistribute configuration on the switch.
Syntax	delete route redistribute [dst [rip ospf] src [rip static local ospf]]
Description	This command will delete the route redistribution settings on this switch.
Parameters	dst – Allows the selection of the protocol on the destination device. src – Allows the selection of the protocol on the source device.
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To delete route redistribution settings:

```
DES-6500:4#delete route redistribute dst rip src ospf
Command: delete route redistribute dst rip src ospf

Success.

DES-6500:4#
```

config route redistribute dst ospf

Purpose	Used to configure route redistribution from RIP to OSPF.
Syntax	config route redistribute dst ospf src [static rip local] ospf {mettype [1 2] {metric <value 0-16777214>}}
Description	Route redistribution allows routers on the network – that are running different routing protocols to exchange routing information. This is accomplished by comparing the routes stored in the various router's routing tables and assigning appropriate metrics. This information is then exchanged among the various routers according to the individual routers current routing protocol. The switch can redistribute routing information between the OSPF and RIP routing protocols to all routers on the network that are running OSPF or RIP. Routing information entered into the Static Routing Table on the local switch is also redistributed.
Parameters	<p>src – Allows the selection of the protocol of the source device.</p> <p>mettype – allows the selection of one of the methods for calculating the metric value. Type-a calculates the metric (for RIP to OSPF) by adding the destination's interface cost to the metric entered in the Metric field. ExtType2 uses the metric entered in the Metric field without change. This field applies only when the destination field is OSPF.</p> <p>metric <value 0-16777214> – Allows the entry of an OSPF interface cost. This is analogous to a Hop Count in the RIP routing protocol.</p>
Restrictions	Only administrator-level users can issue this command.

Routing information source – RIP: the Static Route table, and the Local interface routing information. Routing information will be redistributed to OSPF. The following table lists the allowed values for the routing metrics and the types (or forms) of the routing information that will be redistributed.

Route Source	Metric	Metric Type
RIP	0 to 16777214	mettype 1 mettype 2
Static	0 to 16777214	mettype 1 mettype 2
Local	0 to 16777214	mettype 1 mettype 2

Allowed Metric Type combinations are **mettype 1** or **mettype 2**. The metric value **0** above will be redistributed in OSPF as the metric **20**.

Example Usage:

To configure route redistributions:

```
DES6500:4#config route redistribute dst ospf src rip mettype
1 metric 2
Command: config route redistribute dst ospf src rip mettype 1
metric 2
```

Success.

```
DES-6500:4#
```

config route redistribute dst rip

Purpose	Used to configure route redistribution from OSPF to RIP.
Syntax	config route redistribute dst rip src [local static ospf {all internal external extType1 extType2 inter+e1 inter+e2}] {metric <value 0-16>}
Description	Route redistribution allows routers on the network – that are running different routing protocols to exchange routing information. this is accomplished by comparing the routes stored in the various router's routing tables and assigning appropriate metrics. this information is then exchanged among the various routers according to the individual routers current routing protocol. The switch can redistribute routing information between the OSPF and RIP routing protocols to all routers on the network that are running OSPF or RIP. Routing information entered into the Static Routing Table on the local switch is also redistributed.
Parameters	src – Allows the selection of the routing protocol on the source device. metric <value 0-16> – Allows the entry of an OSPF interface cost. This is analogous to a HOP Count in the RIP routing protocol.
Restrictions	Only administrator-level users can issue this command.

Routing information source – OSPF and the Static Route table. Routing information will be redistributed to RIP. The following table lists the allowed values for the routing metrics and the types (or forms) of the routing information that will be redistributed.

Route Source	Metric	Type
OSPF	0 to 16	all type_1 type_2 internal type_1 internal type_2 external internal
Static	0 to 16	not applicable

Entering the **Type** combination – **internal type_1 type_2** is functionally equivalent to **all**. Entering the combination **type_1 type_2** is functionally equivalent to **external**. Entering the combination **internal external** is functionally equivalent to **all**.

Entering the metric **0** specifies transparency.

Example Usage:

To configure route redistributions:


```
DES6500:4#config route redistribute dst rip src ospf all metric
2
Command: config route redistribute dst rip src ospf all metric
2
```

Success.

```
DES-6500:4#
```

show route redistribute

Purpose	Used to display the route redistribution on the switch.
Syntax	show route redistribute {dst [rip ospf] src [rip static local ospf]}
Description	Displays the current route redistribution settings on the switch.
Parameters	src – Allows the selection of the routing protocol on the source device. dst – Allows the selection of the routing protocol on the destination device.
Restrictions	none.

Example Usage:

To display route redistributions:

```
DES-6500:4#show route redistribute
Command: show route redistribute
```

Source Protocol	Destination Protocol	Type	Metric
-----	-----	-----	-----
STATIC	RIP	All	1
LOCAL	OSPF	Type-2	20

Total Entries : 2

```
DES-6500:4#
```

IGMP COMMANDS

The IGMP commands in the Command Line Interface (CLI) are listed (along with the appropriate parameters) in the following table.

Command	Parameters
config igmp	ipif <ipif_name 12> all version <value 1-2> query_interval <1-65535 sec> max_response_time <1-25 sec> robustness_variable <value 1-255> last_member_query_interval <value 1-25> state [enabled/disabled]
show igmp	ipif <ipif_name 12>
show igmp group	group <group> ipif <ipif_name 12>

Each command is listed, in detail, in the following sections.

config igmp

Purpose	Used to configure IGMP on the switch.
Syntax	config igmp [<ipif_name 12>/all] {version <value 1-2>/query_interval <sec 1 - 65535>/max_response_time <sec 1-25>/robustness_variable <value 1-255>/last_member_query_interval <value 1-25>/state [enabled/disabled]}
Description	This command is used to configure IGMP on the switch.
Parameters	<p><ipif_name 12> – The name of the IP interface for which you want to configure IGMP.</p> <p>all – Specifies all the IP interfaces on the switch.</p> <p>version <value 1-2> – The IGMP version number.</p> <p>query_interval <1-65535 sec> – The time in seconds between general query transmissions, in seconds.</p> <p>max_response_time <1-25 sec> – the maximum time in seconds that the switch will wait for reports from members.</p> <p>robustness_variable <value1-255> – the permitted packet loss that guarantees IGMP.</p> <p>last_member_query_interval <value1-25> – the Max Response Time inserted into Group-Specific Queries sent in response to Leave Group messages, and is also the amount of time between Group-Specific Query messages. The default is 1 second</p>

config igmp

state [enabled/disabled] – Enables or disables IGMP for the specified IP interface.

Restrictions Only administrator-level users can issue this command.

Example Usage:

To configure the IGMP for the IP interface System:

```
DES-6500:4#config igmp all version 1 state enabled
```

```
Command: config igmp all version 1 state enabled
```

```
Success.
```

```
DES-6500:4#
```

show igmp

Purpose Used to display the IGMP configuration for the switch or for a specified IP interface.

Syntax **show igmp {ipif <ipif_name>}**

Description This command will display the IGMP configuration for the switch if no IP interface name is specified. If an IP interface name is specified, the command will display the IGMP configuration for that IP interface.

Parameters <ipif_name> – The name of the IP interface for which the IGMP configuration will be displayed.

Restrictions none.

Example Usage:

To display IGMP configurations:

```

DES-6500:4#show igmp
Command: show igmp

Interface  IP Address  Ver- Query Maximum  Robust- Last Member  State
          sion      sion  Response  ness  Query
          Time      Value  Interval
-----
System    10.90.90.90  1    125    10    2    1    Enabled
Develop   20.1.1.1    1    125    10    2    1    Enabled

Total Entries: 2

DES-6500:4#

```

show igmp group

Purpose	Used to display the switch's IGMP group table.
Syntax	show igmp group {group <group>} {ipif <ipif_name>}
Description	This command will display the IGMP group configuration.
Parameters	group <group> – The multicast group ID. <ipif_name> – The name of the IP interface the IGMP group is part of.
Restrictions	none.

Example Usage:

To display IGMP group table:

```

DES-6500:4#show igmp group
Command: show igmp group

Interface  Multicast Group  Last Reporter  IP Querier  Expire Time
-----
System    224.0.0.2        10.42.73.111  10.48.74.122  260
System    224.0.0.9        10.20.53.1    10.48.74.122  260
System    224.0.1.24       10.18.1.3     10.48.74.122  259
System    224.0.1.41       10.1.43.252   10.48.74.122  259
System    224.0.1.149      10.20.63.11   10.48.74.122  259

Total Entries: 5

DES-6500:4#

```

BOOTP RELAY COMMANDS

The BOOTP relay commands in the Command Line Interface (CLI) are listed (along with the appropriate parameters) in the following table.

Command	Parameters
config bootp_relay	hops <value 1-16> time <sec 0-65535>
config bootp_relay add	ipif <ipif_name 12> <ipaddr>
config bootp_relay delete	ipif <ipif_name 12> <ipaddr>
enable bootp_relay	
disable bootp_relay	
show bootp_relay	ipif <ipif_name>

Each command is listed, in detail, in the following sections.

config bootp_relay

Purpose	Used to configure the BOOTP relay feature of the switch.
Syntax	config bootp_relay {hops <value>} {time <sec>}
Description	This command is used to configure the BOOTP relay feature.
Parameters	hops <value> – Specifies the maximum number of relay agent hops that the BOOTP packets can cross. time <sec> – If this time is exceeded, the switch will relay the BOOTP packet.
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To configure bootp relay status.

```
DES-6500:4#config bootp_relay hops 4 time 2
Command: config bootp_relay hops 4 time 2

Success.

DES-6500:4#
```

config bootp_relay add

Purpose	Used to add an IP destination address to the switch's BOOTP relay table.
Syntax	config bootp_relay add ipif <ipif_name> <ipaddr>
Description	This command adds an IP address as a destination to forward (relay) BOOTP packets to.
Parameters	<ipif_name> – The name of the IP interface in which BOOTP relay is to be enabled. <ipaddr> – The BOOTP server IP address.
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To add a BOOTP relay.

```
DES-6500:4#config bootp_relay add ipif System 10.43.21.12  
Command: config bootp_relay add ipif System 10.43.21.12
```

```
Success.
```

```
DES-6500:4#
```

config bootp_relay delete

Purpose	Used to delete an IP destination addresses from the switch's BOOTP relay table.
Syntax	config bootp_relay delete ipif <ipif_name> <ipaddr>
Description	This command is used to delete an IP destination addresses in the switch's BOOTP relay table.
Parameters	<ipif_name> – The name of the IP interface that contains the IP address below. <ipaddr> – The BOOTP server IP address.
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To delete a BOOTP relay:

```
DES-6500:4#config bootp_relay delete ipif System 10.43.21.12
Command: config bootp_relay delete ipif System 10.43.21.12

Success.

DES-6500:4#
```

enable bootp_relay

Purpose	Used to enable the BOOTP relay function on the switch.
Syntax	enable bootp_relay
Description	This command, in combination with the disable bootp_relay command below, is used to enable and disable the BOOTP relay function on the switch.
Parameters	none.
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To enable the BOOTP relay function:

```
DES-6500:4#enable bootp_relay
Command: enable bootp_relay

Success.

DES-6500:4#
```

disable bootp_relay

Purpose	Used to disable the BOOTP relay function on the switch.
Syntax	disable bootp_relay
Description	This command, in combination with the enable bootp_relay command above, is used to enable and disable the BOOTP relay function on the switch.
Parameters	none.
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To disable the BOOTP relay function:

```
DES-6500:4#disable bootp_relay
```

```
Command: disable bootp_relay
```

```
Success.
```

```
DES-6500:4#
```

show bootp_relay

Purpose	Used to display the current BOOTP relay configuration.
Syntax	show bootp_relay {ipif <ipif_name>}
Description	This command will display the current BOOTP relay configuration for the switch, or if an IP interface name is specified, the BOOTP relay configuration for that IP interface.
Parameters	<ipif_name> – The name of the IP interface for which you want to display the current BOOTP relay configuration.
Restrictions	none.

Example Usage:

To display bootp relay status:

```
DES-6500:4#show bootp_relay
Command: show bootp_relay

Bootp Relay Status      : Disabled
Bootp Hops Count Limit  : 4
Bootp Relay Time Threshold : 0

Interface  Server 1      Server 2      Server 3      Server 4
-----
System     10.48.74.122  10.23.12.34   10.12.34.12   10.48.75.121

Total Entries: 1

DES-6500:4#
```

DNS RELAY COMMANDS

The DNS relay commands in the Command Line Interface (CLI) are listed (along with the appropriate parameters) in the following table.

Command	Parameters
config dnsr	primary secondary nameserver <ipaddr> add delete static <domain name> <ipaddr>
enable dnsr	{cache static}
disable dnsr	{cache static}
show dnsr	static

Each command is listed, in detail, in the following sections.

config dnsr

Purpose	Used to configure the DNS relay function.
Syntax	config dnsr [[primary/secondary] nameserver <ipaddr>[[add delete] static <domain_name> <ipaddr>]
Description	This command is used to configure the DNS relay function on the switch.
Parameters	<p>primary – Indicates that the IP address below is the address of the primary DNS server.</p> <p>secondary – Indicates that the IP address below is the address of the secondary DNS server.</p> <p>nameserver <ipaddr> – The IP address of the DNS nameserver.</p> <p>add delete – Indicates if the user wishes to add or delete the dns relay function.</p> <p><domain_name> – The domain name of the entry.</p> <p><ipaddr> – The IP address of the entry.</p>
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To set IP address 10.43.21.12 of primary name server.

```
DES-6500:4#config dnsr primary nameserver 10.43.21.12
Command: config dnsr primary nameserver 10.43.21.12

Success.

DES-6500:4#
```

Example Usage:

To add an entry domain name dns1, IP address 10.43.21.12 to DNS static table:

```
DES-6500:4#config dnsr add static dns1 10.43.21.12
Command: config dnsr add static dns1 10.43.21.12

Success.

DES-6500:4#
```

Example Usage:

To delete an entry domain name dns1, IP address 10.43.21.12 from DNS static table.

```
DES-6500:4#config dnsr delete static dns1 10.43.21.12
Command: config dnsr delete static dns1 10.43.21.12

Success.

DES-6500:4#
```

enable dnsr

Purpose	Used to enable DNS relay.
Syntax	enable dnsr {cache static}
Description	This command is used, in combination with the disable dnsr command below, to enable and disable DNS Relay on the switch.
Parameters	cache – This parameter will allow the user to enable the cache lookup for the DNS rely on the switch. static - This parameter will allow the user to enable the static table lookup for the DNS rely on the switch.
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To enable DNS relay:

```
DES-6500:4#enable dnsr
```

```
Command: enable dnsr
```

```
Success.
```

```
DES-6500:4#
```

Example Usage:

To enable cache lookup for DNS relay.

```
DES-6500:4#enable dnsr cache
```

```
Command: enable dnsr cache
```

```
Success.
```

```
DES-6500:4#
```

Example Usage:

To enable static table lookup for DNS relay.

```
DES-6500:4#enable dnsr static
Command: enable dnsr static

Success.

DES-6500:4#
```

disable dnsr	
Purpose	Used to disable DNS relay on the switch.
Syntax	disable dnsr {cache static}
Description	This command is used, in combination with the enable dnsr command above, to enable and disable DNS Relay on the switch.
Parameters	cache – This parameter will allow the user to disable the cache lookup for the DNS rely on the switch. static - This parameter will allow the user to disable the static table lookup for the DNS rely on the switch.
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To disable status of DNS relay.

```
DES-6500:4#disable dnsr
Command: disable dnsr

Success.

DES-6500:4#
```

Example Usage:

To disable cache lookup for DNS relay.

```
DES-6500:4#disable dnsr cache
```

```
Command: disable dnsr cache
```

```
Success.
```

```
DES-6500:4#
```

Example Usage:

To disable static table lookup for DNS relay.

```
DES-6500:4#disable dnsr static
```

```
Command: disable dnsr static
```

```
Success.
```

```
DES-6500:4#
```

show dnsr

Purpose	Used to display the current DNS relay status.
Syntax	show dnsr {static}
Description	This command is used to display the current DNS relay status.
Parameters	static – Allows the display of only the static entries into the DNS relay table. If this parameter is omitted, the entire DNS relay table will be displayed.
Restrictions	none.

Example Usage:

To display DNS relay status:

```
DES-6500:4#show dnsm static
Command: show dnsm static

DNS Relay Static Table
Domain Name          IP Address
-----
www.123.com.tw      10.12.12.123
  bbs.ntu.edu.tw    140.112.1.23

Total Entries: 2

DES-6500:4#
```

Example usage:

To display DNS relay table:

```
DES-6500:4#show dnsm
Command: show dnsm

DNSR Status          : Disabled
Primary Name Server  : 10.48.74.122
Secondary Name Server : 20.48.74.123
DNSR Cache Status    : Enabled
DNSR Static Table Status : Enabled

DNS Relay Static Table

Domain Name          IP Address
-----
www.123.com.tw      10.12.12.123
  bbs.ntu.edu.tw    140.112.1.23

Total Entries: 2

DES-6500:4#
```

RIP COMMANDS

The RIP commands in the Command Line Interface (CLI) are listed (along with the appropriate parameters) in the following table.

Command	Parameters
config rip	ipif <ipif_name 12> all authentication [enabled <password>/disabled] tx_mode <value 1-16> [disabled/v1_only/v1_compatible/v2_only] rx_mode [v1_only/v2_only/v1_or_v2/disabled] state [enabled/disabled]
enable rip	
disable rip	
show rip	ipif <ipif_name 12>

Each command is listed, in detail, in the following sections.

config rip rx_mode

Purpose	Used to configure RIP on the switch.
Syntax	config rip [ipif <ipif_name 12>/all] rx_mode [[disable/v1_only]/[v2_only/v1_or_v2] authentication [enabled/disabled] <password>]
Description	This command is used to configure RIP on the switch.
Parameters	<p><ipif_name 12> – The name of the IP interface.</p> <p>all – To configure all RIP receiving mode for all IP interfaces.</p> <p>rx_mode – Determines how received RIP packets will be interpreted – as RIP version V1 only, V2 Only, or V1 Compatible (V1 and V2). This entry specifies which version of the RIP protocol will be used to receive RIP packets. The Disabled entry prevents the reception of RIP packets.</p> <p>disable – Prevents the reception of RIP packets.</p> <p>v1_only – Specifies that only RIP v1 packets will be accepted.</p> <p>v2_only – Specifies that only RIP v2 packets will be accepted.</p> <p>v1_or_v2 – Specifies that RIP v1 or v2 packets will be accepted.</p> <p>authentication [enabled/disabled] – Enables or disables authentication for RIP on the switch.</p> <p><password> – Allows the specification of a case-sensitive password.</p> <p>state [enabled/disabled] – Allows RIP to be enabled and disabled on the</p>

config rip rx_mode

	switch.
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To change the RIP receive mode for the IP interface System:

```
DES-6500:4#config rip ipif System rx_mode v1_only
Command: config rip ipif System rx_mode v1_only

Success.

DES-6500:4#
```

config rip tx_mode

Purpose	Used to configure RIP's transmission mode.
Syntax	config rip [ipif <ipif_name> all] tx_mode [disabled v1_only v1_compatible v2_only] authentication [enabled disabled] <password>
Description	This command is used to configure RIP's transmission mode.
Parameters	<p><ipif_name> – The name of the IP interface.</p> <p>all – To configure all RIP transmitting mode for all IP interfaces.</p> <p>disable – Prevents the transmission of RIP packets.</p> <p>v1_only – Specifies that only RIP v1 packets will be transmitted.</p> <p>v2_only – Specifies that only RIP v2 packets will be transmitted.</p> <p>v1_compatible – Specifies that both RIP v1 and v2 packets will be transmitted.</p> <p>authentication [enabled/disabled] – Enables or disables</p> <p>authentication [enabled/disabled] – Enables or disables authentication for RIP on the switch.</p> <p><password> – Allows the specification of a case-sensitive password.</p>
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To change the RIP transmission mode for the IP interface System:

```
DES-6500:4#config rip ipif System tx_mode v1_only  
Command: config rip ipif System tx_mode v1_only
```

```
Success.
```

```
DES-6500:4#
```

enable rip

Purpose	Used to enable RIP.
Syntax	enable rip
Description	This command is used to enable RIP on the switch.
Parameters	none.
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To enable RIP:

```
DES-6500:4#enable rip  
Command: enable rip
```

```
Success.
```

```
DES-6500:4#
```

disable rip

Purpose	Used to disable RIP.
Syntax	disable rip
Description	This command is used to disable RIP on the switch.
Parameters	none.
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To disable rip:

```
DES-6500:4#disable rip
```

```
Command: disable rip
```

```
Success.
```

```
DES-6500:4#
```

show rip

Purpose	Used to display the RIP configuration and statistics for the switch.
Syntax	show rip {ipif <ipif_name>}
Description	This command will display the RIP configuration and statistics for a given IP interface or for all IP interfaces.
Parameters	<ipif_name> – the name of the IP interface for which you want to display the RIP configuration and settings. If this parameter is not specified, the show rip command will display the global RIP configuration for the switch.
Restrictions	none.

Example Usage:

To display RIP configuration:

```
DES-6500:4#show rip
```

```
Command: show rip
```

```
RIP Global State : Disabled
```

```
RIP Interface Settings
```

Interface	IP Address	TX Mode	RX Mode	Authen- tication	State
-----	-----	-----	-----	-----	-----
System	10.41.44.33/8	Disabled	Disabled	Disabled	Disabled

```
Total Entries : 1
```

```
DES-6500:4#
```

DVMRP COMMANDS

The DVMRP commands in the Command Line Interface (CLI) are listed (along with the appropriate parameters) in the following table.

Command	Parameters
config dvmrp	ipif <ipif_name 12> all metric <value 1-31> probe <sec 1-65535> neighbor_timeout <sec 1-65535> state [enabled/disabled]
enable dvmrp	
disable dvmrp	
show dvmrp neighbor	ipif <ipif_name 12> ipaddress <network_address>
show dvmrp nexthop	ipif <ipif_name 12> ipaddress <network_address>
show dvmrp routing_table	ipaddress <network_address>
show dvmrp	ipif <ipif_name>

Each command is listed, in detail, in the following sections.

config dvmrp

Purpose	Used to configure DVMRP on the switch.
Syntax	config dvmrp [ipif <ipif_name>/all] {metric <value>/probe <second>/neighbor_timeout <second>/state [enabled/disabled]}
Description	This command is used to configure DVMRP on the switch.
Parameters	<p><ipif_name> – The name of the IP interface for which DVMRP is to be configured.</p> <p>all – Specifies that DVMRP is to be configured for all IP interfaces on the switch.</p> <p>metric <value> – Allows the assignment of a DVMRP route cost to the above IP interface. A DVMRP route cost is a relative number that represents the real cost of using this route in the construction of a multicast delivery tree. It is similar to, but not defined as, the hop count in RIP. The default is 1.</p> <p>probe <second> – DVMRP defined an extension to IGMP that allows routers to query other routers to determine if a multicast group is present on a given router subnetwork or not. This is referred to as a 'probe'. The default value is 10 seconds.</p> <p>neighbor_timeout <second> – The time period for which DVMRP will</p>

config dvmrp

	hold Neighbor Router reports before issuing poison route messages. The default value is 35 seconds.
	state [enabled/disabled] – Allows DVMRP to be enabled or disabled.
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To configure DVMRP configurations of IP interface System:

```
DES-6500:4#config dvmrp ipif System neighbor_timeout 30  
metric 1 probe 5
```

```
Command: config dvmrp ipif System neighbor_timeout 30  
metric 1 probe 5
```

```
Success
```

```
DES-6500:4#
```

enable dvmrp

Purpose	Used to enable DVMRP.
Syntax	enable dvmrp
Description	This command, in combination with the disable dvmrp below, to enable and disable DVMRP on the switch.
Parameters	none.
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To enable DVMRP:

```
DES-6500:4#enable dvmrp
```

```
Command: enable dvmrp
```

```
Success.
```

```
DES-6500:4#
```

disable dvmrp

Purpose	Used to disable DVMRP.
Syntax	disable dvmrp
Description	This command, in combination with the enable dvmrp above, to enable and disable DVMRP on the switch.
Parameters	none.
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To disable DVMRP:

```
DES-6500:4#disable dvmrp
```

```
Command: disable dvmrp
```

```
Success.
```

```
DES-6500:4#
```

show dvmrp routing_table

Purpose	Used to display the current DVMRP routing table.
Syntax	show dvmrp routing table {ipaddress <network_address>}
Description	The command is used to display the current DVMRP routing table.
Parameters	<p><ipif_name> – The name of the IP interface for which you want to display the corresponding DVMRP routing table.</p> <p>ipaddress <network_address> – The IP address and netmask of the destination. You can specify the IP address and netmask information using the traditional format or the CIDR format. For example, 10.1.2.3/255.255.0.0 or 10.2.3.4/16.</p>
Restrictions	none.

Example Usage:

To display DVMRP routing table:

```
DES-6500:4#show dvmrp routing_table
Command: show dvmrp routing_table

DVMRP Routing Table
Source Address/Netmask   Next Hop Router   Hop   Learned   Interface   Expire
-----
10.0.0.0/8               10.90.90.90      2     Local     System      -
20.0.0.0/8               20.1.1.1         2     Local     ip2         117
30.0.0.0/8               30.1.1.1         2     Dynamic   ip3         106

Total Entries: 3

DES-6500:4#
```

show dvmrp neighbor

Purpose	Used to display the DVMRP neighbor table.
Syntax	show dvmrp neighbor {ipif <ipif_name>/ipaddress <network_address>}
Description	This command will display the current DVMRP neighbor table.
Parameters	<ipif_name> – The name of the IP interface for which you want to display the DVMRP neighbor table. ipaddress <network_address> – The IP address and netmask of the destination. You can specify the IP address and netmask information using the traditional format or the CIDR format. For example, 10.1.2.3/255.255.0.0 or 10.2.3.4/16.
Restrictions	none.

Example Usage:

To display DVMRP neighbor table:

```
DES-6500:4#show dvmrp neighbor
Command: show dvmrp neighbor

DVMRP Neighbor Address Table

Interface  Neighbor Address/Netmask  Generation ID  Expire Time
-----  -
System    10.2.1.123                2              250

Total Entries: 1

DES-6500:4#
```

show dvmrp nexthop

Purpose	Used to display the current DVMRP routing next hop table.
Syntax	show dvmrp nexthop {ipaddress <network_address>/ipif <ipif_name>}
Description	This command will display the DVMRP routing next hop table.
Parameters	<ipif_name> – The name of the IP interface for which you want to display the current DVMRP routing next hop table. ipaddress <network_address> – The IP address and netmask of the destination. You can specify the IP address and netmask information using the traditional format or the CIDR format. For example, 10.1.2.3/255.255.0.0 or 10.2.3.4/16.
Restrictions	none.

Example Usage:

To display DVMRP routing next hop table:

```
DES-6500:4#show dvmrp nexthop
Command: show dvmrp nexthop
Source IP Address/Netmask  Interface Name  Type
-----
10.0.0.0/8                 ip2            Leaf
10.0.0.0/8                 ip3            Leaf
20.0.0.0/8                 System         Leaf

Total Entries: 3

DES-6500:4#
```

show dvmrp	
Purpose	Used to display the DVMRP configurations.
Syntax	show dvmrp {<ipif_name>}
Description	The command will display the DVMRP configurations
Parameters	<ipif_name> – The name of the IP interface for which you want to display DVMRP configurations.
Restrictions	none.

Example Usage:

To show DVMRP configurations:

```
DES-6500:4#show dvmrp
Command: show dvmrp

DVMRP Global State : Disabled
Interface IP Address/Netmask Neighbor Timeout Probe Metric State
-----
System   10.90.90.90/8           35           10           1 Disabled

Total Entries: 1

DES-6500:4#
```

PIM COMMANDS

The PIM commands in the Command Line Interface (CLI) are listed (along with the appropriate parameters) in the following table.

Command	Parameters
config pim	[ipif <ipif_name 12> all] { hello <sec 1-18724> jp_interval <sec 1-18724> state [enabled disabled]}
enable pim	
disable pim	
show pim neighbor	{ipif <ipif_name 12> ipaddress <network_address>}
show pim	{ipif <ipif_name 12>}

Each command is listed, in detail, in the following sections.

config pim

Purpose	Used to configure PIM settings for the switch or for specified IP interfaces.
Syntax	config pim [ipif <ipif_name 12> all] { hello <sec 1-18724> jp_interval <sec 1-18724> state [enabled disabled]}
Description	The config pim command is used to configure PIM settings and enable or disable PIM settings for specified IP interfaces. PIM must also be globally enabled to function (see enable pim).
Parameters	<p>ipif – Name assigned to the specific IP interface being configured for PIM settings.</p> <p>all – Used to configure PIM settings for all IP interfaces.</p> <p>hello - The time, in seconds, between issuing hello packets to find neighboring routers.</p> <p>jp_interval – The join/prune interval is the time value (seconds) between transmitting (flooding to all interfaces) multicast messages to downstream routers, and automatically ‘pruning’ a branch from the multicast delivery tree. The jp_interval is also the interval used by the router to automatically remove prune information from a branch of a multicast delivery tree and begin to flood multicast messages to all branches of that delivery tree. These two actions are equivalent. The range is between 1 and 18724 seconds. The default is 60 seconds.</p> <p>state – This can enable or disable PIM for the specified IP interface. The default is disabled. Note that PIM settings must also be enabled globally for the switch with the enable pim described below for PIM to operate on any configured IP interfaces.</p>
Restrictions	Only administrator-level users can issue this command.

Usage Example:

To configure PIM settings for IP interface “System”:

```
DES-6500:4#config pim ipif System hello 35 jp_interval 70
state enabled
Command: config pim ipif System hello 35 jp_interval 70 state
enabled

Success.

DES-6500:4#
```

enable pim

Purpose	Used to enable PIM function on the switch.
Syntax	enable pim
Description	This command will enable PIM for the switch. PIM settings must first be configured for specific IP interfaces using config pim command.
Parameters	None.
Restrictions	Only administrator-level users can use this command.

Usage Example:

To enable PIM as previously configured on the switch:

```
DES-6500:4#enable pim
Command: enable pim

Success.

DES-6500:4#
```

disable pim

Purpose	Used to disable PIM function on the switch.
Syntax	disable pim
Description	This command will disable PIM for the switch. Any previously configured PIM settings will remain unchanged and may be enabled at a later time with the enable pim .

disable pim

Parameters	None.
Restrictions	Only administrator-level users can use this command.

Usage Example:

To disable PIM on the switch:

```
DES-6500:4#disable pim
```

```
Command: disable pim
```

```
Success.
```

```
DES-6500:4#
```

show pim neighbor

Purpose	Used to display PIM neighbor router table entries.
Syntax	show pim neighbor {ipif <ipif_name 12> ipaddress <network_address>}
Description	This command will list current entries in the PIM neighbor table for a specified IP interface or destination router IP address.
Parameters	<p>ipif – The name of an IP interface for which you want to view the PIM neighbor router table.</p> <p>ipaddress - The IP address and netmask of the destination routing device for which you want to view the neighbor raouter table. You can specify the IP address and netmask information usnig the traditional format or the CIDR format. For example, 10.1.2.3/255.255.0.0 or 10.2.3.4/16.</p> <p>If no parameters are specified, all PIM neighbor router tables are displayed.</p>
Restrictions	None.

Usage Example:

To display PIM settings as configured on the switch:

DES-6500:4#show pim neighbor

Command: show pim neighbor

PIM Neighbor Address Table

Interface Name	Neighbor Address	Expire Time
----------------	------------------	-------------

-----	-----	-----
System	10.48.74.122	5

Total Entries : 1

DES-6500:4#

show pim

Purpose	Used to display current PIM configuration.
Syntax	show pim {ipif <ipif_name 12>}
Description	This command will list current PIM configuration settings for a specified IP interface or all IP interfaces.
Parameters	ipif – The name of an IP interface for which PIM settings are listed. If no parameters are specified, all PIM settings are displayed for all interfaces.
Restrictions	None.

Usage Example:

To display PIM settings as configured on the switch:

DES-6500:4#show pim

Command: show pim

PIM Global State : Disabled

PIM-DM Interface Table

Interface	IP Address	Hello Interval	Join/Prune Interval	State
System	10.90.90.90/8	35	0	Enabled

Total Entries : 1

DES-6500:4#

IP MULTICASTING COMMANDS

The IP multicasting commands in the Command Line Interface (CLI) are listed (along with the appropriate parameters) in the following table.

Command	Parameters
show ipmc cache	group <group> ipaddress <network_address>
show ipmc	ipif {ipif <ipif_name> protocol dvmrp

Each command is listed, in detail, in the following sections.

show ipmc cache

Purpose	Used to display the current IP multicast forwarding cache.
Syntax	show ipmc cache {group <group>} {ipaddress<network_address>}
Description	This command will display the current IP multicast forwarding cache.
Parameters	<p><group> – The multicast group ID.</p> <p><network_address> – The IP address and netmask of the destination. You can specify the IP address and netmask information using the traditional format or the CIDR format. For example, 10.1.2.3/255.255.0.0 or 10.2.3.4/16.</p>
Restrictions	none.

Usage Example:

To display the current IP multicast forwarding cache:

```
DES-6500:4#show ipmc cache
Command: show ipmc cache
Multicast      Source Address/  Upstream      Expire      Routing
Group          Netmask          Neighbor      Neighbor      Time
Protocol
-----
224.1.1.1      10.48.74.121/32  10.48.75.63   30          dvmrp
224.1.1.1      20.48.74.25 /32  20.48.75.25   20          pim-dm
224.1.2.3      10.48.75.3 /3   10.48.76.6    30          dvmrp

Total Entries: 3

DES-6500:4#
```

show ipmc

Purpose	Used to display the IP multicast interface table.
Syntax	show ipmc {ipif <ipif_name>/protocol [dvmrp/pim]}
Description	This command will display the current IP multicast interface table.
Parameters	<ipif_name> – The name of the IP interface for which you want to display the IP multicast interface table for. protocol [dvmrp/pim] – Allows you to specify either the DVMRP or PIM protocol to be used in displaying the IP multicast interface table. For example, if DVMRP is specified, the table will display only those entries that are related to the DVMRP protocol.
Restrictions	none.

Usage Example

To display the current IP multicast interface table:

```
DES-6500:4#show ipmc
Command: show ipmc

Interface Name      IP Address      Multicast Routing
-----
System             10.90.90.90    PIM-DM

Total Entries: 1

DES-6500:4#
```

MD5 CONFIGURATION COMMANDS

The MD5 configuration commands in the Command Line Interface (CLI) are listed (along with the appropriate parameters) in the following table.

Command	Parameters
config md5	key <key_id 1-255> <password 16>
create md5	key <key_id 1-255> <password 16>
delete md5	key <key_id 1-255>
show md5	key <key_id 1-255>

Each command is listed, in detail, in the following sections.

config md5	
Purpose	Used to enter configure the password for an MD5 key.
Syntax	config md5 key <key_id> <password>
Description	This command is used to configure an MD5 key and password.
Parameters	key <key_id> – The MD5 key ID. <password> – An MD5 password of up to 16 characters.
Restrictions	Only administrator-level users can issue this command.

Usage Example

To configure an MD5 Key password:

```
DES-6500:4#config md5 key 1 dlink
Command: config md5 key 1 dlink

Success.

DES-6500:4#
```

create md5

Purpose	Used to create a new entry in the MD5 key table.
Syntax	create md5 key <key_id> <password>
Description	This command is used to create an entry for the MD5 key table.
Parameters	<key_id> – The MD5 key ID. <password> – An MD5 password of up to 16 bytes.
Restrictions	Only administrator-level users can issue this command.

Usage Example

To create an entry in the MD5 key table:

```
DES-6500:4# create md5 key 1 dlink
Command: create md5 key 1 dlink

Success.

DES-6500:4#
```

delete md5

Purpose	Used to delete an entry in the MD5 key table.
Syntax	delete md5 key <key_id>
Description	This command is used to delete a specific entry in the MD5 key table.
Parameters	<key_id> – The MD5 key ID.
Restrictions	Only administrator-level users can issue this command.

Usage Example

The delete an entry in the MD5 key table:

```
DES-6500:4# delete md5 key 1
Command: delete md5 key 1

Success.

DES-6500:4#
```

show md5

Purpose	Used to display an MD5 key table.
Syntax	show md5 {key <key_id>}
Description	This command will display the current MD5 key table.
Parameters	<key_id> – The MD5 key ID.
Restrictions	none.

Usage Example

To display the current MD5 key:

```
DES-6500:4#show md5
Command: show md5

MD5 Key Table

Key-ID      Key
-----      -
  1         dlink
  2        develop
  3        fireball
  4    intelligent

Total Entries: 4

DES-6500:4#
```

OSPF CONFIGURATION COMMANDS

The OSPF configuration commands in the Command Line Interface (CLI) are listed (along with the appropriate parameters) in the following table.

Command	Parameters
config ospf	router_id <ipaddr 0.0.0.0 – 255.255.255.255>
enable ospf	
disable ospf	
show ospf	{ipif <ipif_name 12> all}
create ospf area	<area_id 0.0.0.0-255.255.255.255> type [normal/stub] stub_summary [enabled disabled] metric <value 0-65535>
delete ospf area	<area_id>
config ospf area	<area_id> type [normal stub] stub_summary [enabled disabled] metric <value 0-65535>
show ospf area	<area_id>
create ospf host_route	<ipaddr> area <area_id> metric <value 1-65535>
delete ospf host_route	<ipaddr>
config ospf host_route	<ipaddr> area <area_id> metric <value>
show ospf host_route	<ipaddr>
create ospf aggregation	<area_id> <network_address> lsdb_type [summary] advertise [enabled disabled]
delete ospf aggregation	<area_id> <network_address> lsdb_type [summary]
config ospf aggregation	<area_id> <network_address> lsdb_type [summary] advertise [enabled disabled]
show ospf aggregation	<area_id>
show ospf lsdb	area <area_id> advertise_router <ipaddr> type [rtrlink netlink summary assummary asextlink]
show ospf neighbor	<ipaddr>
show ospf virtual_neighbor	<area_id> <neighbor_id>
config ospf ipif	<ipif_name 12>

Command	Parameters
	area <area_id> priority <value 0-255> hello_interval <sec 1-65535> dead_interval <sec 1-65535> authentication [none simple <password 8> md5 <key_id 1-255>] metric <value 1-65535> state [enabled/disabled]
config ospf all	area <area_id> priority <value 0-255> hello_interval <sec 1-65535> dead_interval <sec 1-65535> authentication [none simple <password> md5 <key_id 1-255>] metric <value 1-65535> state [enabled/disabled]
show ospf ipif	<ipif_name 12>
show ospf all	
create ospf virtual_link	<area_id> <neighbor_id> hello_interval <sec 1-65535> dead_interval <sec 1-65535> authentication [simple <password 8> md5 <key_id 1-255> none]
config ospf virtual_link	<area_id> <neighbor_id> hello_interval <sec 1-65535> dead_interval <sec 1-65535> authentication [simple <password 8> md5 <key_id 1-255> none]
delete ospf virtual_link	<area_id> <neighbor_id>
show ospf virtual_link	<area_id> <neighbor_id>

Each command is listed, in detail, in the following sections.

config ospf	
Purpose	Used to configure the OSPF router ID.
Syntax	config ospf {router_id <ipaddr 0.0.0.0 – 255.255.255.255>}
Description	This command is used to configure the OSPF router ID.
Parameters	<ipaddr> – The OSPF router ID.
Restrictions	Only administrator-level users can issue this command.

Usage Example

To configure the OSPF router ID:

```
DES-6500:4#config ospf router_id 10.48.74.122
Command: config ospf router_id 10.48.74.122
```

```
Success.
```

```
DES-6500:4#
```

enable ospf

Purpose	Used to enable OSPF on the switch.
Syntax	enable ospf
Description	This command, in combination with the disable ospf command below, is used to enable and disable OSPF on the switch.
Parameters	none.
Restrictions	Only administrator-level users can issue this command.

Usage Example

To enable OSPF on the switch:

```
DES-6500:4#enable ospf
Command: enable ospf
```

```
Success.
```

```
DES-6500:4#
```

disable ospf

Purpose	Used to disable OSPF on the switch.
Syntax	disable ospf
Description	This command, in combination with the enable ospf command above, is used to enable and disable OSPF on the switch.
Parameters	none.
Restrictions	Only administrator-level users can issue this command.

Usage Example

To disable OSPF on the switch:

DES-6500:4#disable ospf

Command: disable ospf

Success.

DES-6500:4#

show ospf

Purpose	Used to display the current OSPF state on the switch.
Syntax	show ospf {ipif <ipif_name 12> all}
Description	<p>This command will display the current state of OSPF on the switch, divided into the following categories:</p> <ul style="list-style-type: none">General OSPF settingsOSPF Interface settingsOSPF Area settingsOSPF Virtual Interface settingsOSPF Area Aggregation settingsOSPF Host Route settings
Parameters	<p>ipif <ipif_name 12> - Enter the name of the ip interface to view the ospf settings for.</p> <p>all – Enter this command to view all ospf entries.</p>
Restrictions	none.

Usage Example:

To show OSPF state:

```
DES-6500:4#show ospf
Command: show ospf

OSPF Router ID : 10.1.1.2
State      : Enabled

OSPF Interface Settings

Interface  IP Address  Area ID  State  Link Status  Metric
-----  -
System    10.90.90.90/8  0.0.0.0  Disabled  Link DOWN  1
  ip2     20.1.1.1/8   0.0.0.0  Disabled  Link DOWN  1
  ip3     30.1.1.1/8   0.0.0.0  Disabled  Link DOWN  1

Total Entries : 3

OSPF Area Settings

Area ID    Type  Stub Import Summary  LSA Stub Default Cost
-----  -
  0.0.0.0  Normal  None  None
 10.0.0.0  Normal  None  None
 10.1.1.1  Normal  None  None
 20.1.1.1  Stub    Enabled  1

Total Entries : 4
```

Virtual Interface Configuration

Transit Area ID	Virtual Neighbor Router	Hello Interval	Dead Interval	Authentication	Link Status
10.0.0.0	20.0.0.0	10	60	None	DOWN
10.1.1.1	20.1.1.1	10	60	None	DOWN

Total Entries : 2

OSPF Area Aggregation Settings

Area ID	Aggregated Network Address	LSDB Type	Advertise
---------	----------------------------	-----------	-----------

Total Entries : 0

OSPF Host Route Settings

Host Address	Metric	Area ID	TOS
10.3.3.3	1	10.1.1.1	0

Total Entries : 1

DES-6500:4#

create ospf area

Purpose	Used to configure OSPF area settings.
Syntax	create ospf area <area_id 0.0.0.0-255.255.255.255> type [normal/stub] {stub_summary [enabled/disabled]/metric <value>}}
Description	This command is used to create an OSPF area and configure its settings.
Parameters	<p><area_id> – The OSPF area ID.</p> <p>type – The OSPF area mode of operation – stub or normal.</p> <p>stub_summary – enables or disables the OSPF area to import summary LSA advertisements.</p> <p><value> – The OSPF area cost between 0 and 65535. The default is 0.</p>
Restrictions	Only administrator-level users can issue this command.

Usage Example:

To create an OSPF area:

```
DES-6500:4#create ospf area 10.48.74.122 type normal
Command: create ospf area 10.48.74.122 type normal

Success.

DES-6500:4#
```

delete ospf area	
Purpose	Used to delete an OSPF area.
Syntax	delete ospf area <area_id>
Description	This command is used to delete an OSPF area.
Parameters	<area_id> – A 32-bit number in the form of an IP address (xxx.xxx.xxx.xxx) that uniquely identifies the OSPF area in the OSPF domain.
Restrictions	Only administrator-level users can issue this command.

Usage Example:

To delete an OSPF area:

```
DES-6500:4#delete ospf area 10.48.74.122
Command: delete ospf area 10.48.74.122

Success.

DES-6500:4#
```

config ospf area

Purpose	Used to configure an OSPF area's settings.
Syntax	config ospf area <area_id> type [normal/stub {stub_summary [enabled/disabled]/metric <value>}]
Description	This command is used to configure an OSPF area's settings.
Parameters	<p><area_id> – The OSPF area ID.</p> <p>type – Allows the specification of the OSPF mode of operation – stub or normal.</p> <p>stub_summary [enabled/disabled] – Allows the OSPF area import of LSA advertisements to be enabled or disabled.</p> <p><value> – The OSPF area stub default cost.</p>
Restrictions	Only administrator-level users can issue this command.

Usage Example

To configure an OSPF area's settings:

```
DES-6500:4#config ospf area 10.48.74.122 type stub
stub_summary enabled metric 1
Command: config ospf area 10.48.74.122 type stub
stub_summary enabled metric 1
```

Success.

```
DES-6500:4#
```

show ospf area

Purpose	Used to display an OSPF area's configuration.
Syntax	show ospf area {<area_id>}
Description	This command will display the current OSPF area configuration.
Parameters	<area_id> – A 32-bit number in the form of an IP address (xxx.xxx.xxx.xxx) that uniquely identifies the OSPF area in the OSPF domain.
Restrictions	none.

Usage Example

To display an OSPF area's settings:

```
DES-6500:4#show ospf area
Command: show ospf area
  Area Id   Type   Stub Import Summary LSA  Stub   Default Cost
-----
  0.0.0.0   Normal None                    None   None
  10.48.74.122 Stub  Enabled                 Enabled 1
Total Entries: 2
DES-6500:4#
```

create ospf host_route

Purpose	Used to configure OSPF host route settings.
Syntax	create ospf host_route <ipaddr> {area <area_id>/metric <value>}
Description	This command is used to configure the OSPF host route settings.
Parameters	<ipaddr> – The host's IP address <area_id> – A 32-bit number in the form of an IP address (xxx.xxx.xxx.xxx) that uniquely identifies the OSPF area in the OSPF domain. <value> – A metric between 1 and 65535, which will be advertised.
Restrictions	Only administrator-level users can issue this command.

Usage Example

To configure the OSPF host route settings:

```
DES-6500:4#create ospf host_route 10.48.74.122 area 10.1.1.1
metric 2
Command: create ospf host_route 10.48.74.122 area 10.1.1.1
metric 2
Success.
DES-6500:4#
```

delete ospf host_route

Purpose	Used to delete an OSPF host route.
Syntax	delete ospf host_route <ipaddr>
Description	This command is used to delete an OSPF host route.
Parameters	<ipaddr> – The IP address of the OSPF host.
Restrictions	Only administrator-level users can issue this command.

Usage Example

To delete an OSPF host route:

```
DES-6500:4#delete ospf host_route 10.48.74.122
```

```
Command: delete ospf host_route 10.48.74.122
```

```
Success.
```

```
DES-6500:4#
```

config ospf host_route

Purpose	Used to configure OSPF host route settings.
Syntax	config ospf host_route <ipaddr> {area <area_id>/metric <value>}
Description	This command is used to configure an OSPF host route settings.
Parameters	<ipaddr> – The IP address of the host. <area_id> – A 32-bit number in the form of an IP address (xxx.xxx.xxx.xxx) that uniquely identifies the OSPF area in the OSPF domain. <value> – a metric between 1 and 65535 that will be advertised for the route.
Restrictions	Only administrator-level users can issue this command.

Usage Example

To configure an OSPF host route:

```
DES-6500:4#config ospf host_route 10.48.74.122 area 10.1.1.1
metric 2
Command: config ospf host_route 10.48.74.122 area 10.1.1.1
metric 2

Success.

DES-6500:4#
```

show ospf host_route

Purpose	Used to display the current OSPF host route table.
Syntax	show ospf host_route {<ipaddr>}
Description	This command will display the current OSPF host route table.
Parameters	<ipaddr> – The IP address of the host.
Restrictions	none.

Usage Example:

To display the current OSPF host route table:

```
DES-6500:4#show ospf host_route
Command: show ospf host_route

Host Address  Metric      Area_ID     TOS
-----
10.48.73.21   2           10.1.1.1    0
10.48.74.122 1           10.1.1.1    0

Total Entries: 2

DES-6500:4#
```

create ospf aggregation

Purpose	Used to configure OSPF area aggregation settings.
Syntax	create ospf aggregation <area_id> <network_address> Isdb_type [summary] {advertise [enabled/disabled]}
Description	This command is used to create an OSPF area aggregation.
Parameters	<p><area_id> – A 32-bit number in the form of an IP address (xxx.xxx.xxx.xxx) that uniquely identifies the OSPF area in the OSPF domain.</p> <p><network_address> – The 32-bit number in the form of an IP address that uniquely identifies the network that corresponds to the OSPF Area.</p> <p>Isdb_type [summary] – The type of address aggregation.</p> <p>advertise [enabled/disabled] – Allows for the advertisement trigger to be enabled or disabled.</p>
Restrictions	Only administrator-level users can issue this command.

Usage Example:

To create an OSPF area aggregation:

```
DES-6500:4#create ospf aggregation 10.1.1.1 10.48.76.122/16  
Isdb_type summary advertise enabled
```

```
Command: create ospf aggregation 10.1.1.1 10.48.76.122/16  
Isdb_type summary advertise enabled
```

```
Success.
```

```
DES-6500:4#
```

delete ospf aggregation

Purpose	Used to delete an OSPF area aggregation configuration.
Syntax	delete ospf aggregation <area_id> <network_address> Isdb_type [summary]
Description	This command is used to delete an OSPF area aggregation configuration.
Parameters	<p><area_id> – A 32-bit number in the form of an IP address (xxx.xxx.xxx.xxx) that uniquely identifies the OSPF area in the OSPF domain.</p> <p><network_address> – The 32-bit number in the form of an IP address that uniquely identifies the network that corresponds to the OSPF Area.</p>

delete ospf aggregation

	lsdb_type [summary] – Specifies the type of address aggregation.
Restrictions	Only administrator-level users can issue this command.

Usage Example

To configure the OSPF area aggregation settings:

```
DES-6500:4#delete ospf aggregation 10.1.1.1 10.48.76.122/16
lsdb_type summary
Command: delete ospf aggregation 10.1.1.1 10.48.76..122/16
lsdb_type summary

Success.

DES-6500:4#
```

config ospf aggregation

Purpose	Used to configure the OSPF area aggregation settings.
Syntax	config ospf aggregation <area_id> <network_address> lsdb_type [summary] advertise [enabled/disabled]
Description	This command is used to configure the OSPF area aggregation settings.
Parameters	<p><area_id> – A 32-bit number in the form of an IP address (xxx.xxx.xxx.xxx) that uniquely identifies the OSPF area in the OSPF domain.</p> <p><network_address> – The 32-bit number in the form of an IP address that uniquely identifies the network that corresponds to the OSPF Area.</p> <p>lsdb_type [summary] – Specifies the type of address aggregation.</p> <p>advertise [enabled/disabled] – Allows for the advertisement trigger to be enabled or disabled.</p>
Restrictions	Only administrator-level users can issue this command.

Usage Example

To configure the OSPF area aggregation settings:

```
DES-6500:4#config ospf aggregation 10.1.1.1 10.48.76.122/16
lsdb_type summary advertise enabled
```

```
Command: config ospf aggregation 10.1.1.1 10.48.76.122/16
lsdb_type summary advertise enabled
```

Success.

```
DES-6500:4#
```

show ospf aggregation

Purpose	Used to display the current OSPF area aggregation settings.
Syntax	show ospf aggregation {<area_id>}
Description	This command will display the current OSPF area aggregation settings.
Parameters	<area_id> – The OSPF area ID.
Restrictions	none.

Usage Example

To display OSPF area aggregation settings:

```
DES-6500:4#show ospf aggregation
```

```
Command: show ospf aggregation
```

OSPF Area Aggregation Settings

Area ID	Aggregated Network Address	LSDB Type	Advertise
10.1.1.1	10.0.0.0/8	Summary	Enabled
10.1.1.1	20.2.0.0/16	Summary	Enabled

```
Total Entries: 2
```

```
DES-6500:4#
```

show ospf lsdb

Purpose	Used to display the OSPF Link State Database (LSDB).
Syntax	show ospf lsdb {area_id <area_id>/advertise_router <ipaddr>/type [rtrlink/netlink/summary/assummary/asextlink]}
Description	This command will display the current OSPF Link State Database (LSDB).
Parameters	area_id <area_id> – A 32-bit number in the form of an IP address (xxx.xxx.xxx.xxx) that uniquely identifies the OSPF area in the OSPF domain.

show ospf lsdb

(xxx.xxx.xxx.xxx) that uniquely identifies the OSPF area in the OSPF domain.

advertise_router <ipaddr> – The router ID of the advertising router.

type [rtrlink/netlink/summary/assummary/asextlink] – The type of link.

Restrictions none.



NOTE: When this command displays a “*” (a star symbol) in the OSPF LSDB table for the Area_id or the Cost, this is interpreted as “no area ID” for external LSAs, and as “no cost given” for the advertised link.

Usage Example:

To display the link state database of OSPF:

```
DES-6500:4#show ospf lsdb
```

```
Command: show ospf lsdb
```

Area ID	LSDB Type	Advertising Router ID	Link State ID	Cost	Sequence Number
0.0.0.0	RTRLink	50.48.75.73	50.48.75.73	*	0x80000002
0.0.0.0	Summary	50.48.75.73	10.0.0.0/8	1	0x80000001
1.0.0.0	RTRLink	50.48.75.73	50.48.75.73	*	0x80000001
1.0.0.0	Summary	50.48.75.73	40.0.0.0/8	1	0x80000001
1.0.0.0	Summary	50.48.75.73	50.0.0.0/8	1	0x80000001
*	ASExtLink	50.48.75.73	1.2.0.0/16	20	0x80000001

```
Total Entries: 5
```

```
DES-6500:4#
```

show ospf neighbor

Purpose Used to display the current OSPF neighbor router table.

Syntax **show ospf neighbor {<ipaddr>}**

Description This command will display the current OSPF neighbor router table.

Parameters <ipaddr> – the IP address of the neighbor router.

Restrictions none.

Usage Example

To display the current OSPF neighbor router table:

```
DES-6500:4#show ospf neighbor
Command: show ospf neighbor

  IP Address of Neighbor      Router ID of Neighbor      Neighbor Priority      Neighbor State
  -----
10.48.74.122                 10.2.2.2                   1                      Initial

DES-6500:4#
```

show ospf virtual neighbor

Purpose	Used to display the current OSPF virtual neighbor router table.
Syntax	show ospf virtual_neighbor {<area_id> <neighbor id>}
Description	This command will display the current OSPF virtual neighbor router table.
Parameters	<p><area_id> – A 32-bit number in the form of an IP address (xxx.xxx.xxx.xxx) that uniquely identifies the OSPF area in the OSPF domain.</p> <p><neighbor_id> – The OSPF router ID for the neighbor. This is a 32-bit number in the form of an IP address (xxx.xxx.xxx.xxx) that uniquely identifies the remote area's Area Border Router.</p>
Restrictions	none.

Usage Example

To display the current OSPF virtual neighbor table:

```
DES-6500:4#show ospf virtual_neighbor
Command: show ospf virtual_neighbor

Transit   Router ID of   IP Address of   Virtual Neighbor
Area ID   Virtual Neighbor Virtual Neighbor State
-----
10.1.1.1  10.2.3.4      10.48.74.111   Exchange

DES-6500:4#
```

config ospf ipif

Purpose	Used to configure the OSPF interface settings.
Syntax	config ospf ipif <ipif_name> {area <area_id>/priority <value 0-255>/hello_interval <sec 1-65535>/dead_interval <sec 1-65535>/authentication [none/simple <password>/md5 <key_id>]/metric <value>/state [enabled/disabled]}
Description	This command is used to configure the OSPF interface settings.
Parameters	<p><ipif_name> – The name of the IP interface.</p> <p>priority <value 0-255> – The priority used in the election of the Designated Router (DR). A number between 0 and 255.</p> <p>metric <value> – The interface metric (1 to 65535). Entering a 0 will allow automatic calculation of the metric.</p> <p>hello_interval <sec 1-65535> – Allows the specification of the interval between the transmission of OSPF Hello packets, in seconds. Between 1 and 65535 seconds can be specified. The Hello Interval, Dead Interval, Authorization Type, and Authorization Key should be the same for all routers on the same network.</p> <p>dead_interval <sec 1-65535> – Allows the specification of the length of time between the receipt of Hello packets from a neighbor router before the selected area declares that router down. An interval between 1 and 65535 seconds can be specified. The Dead Interval must be evenly divisible by the Hello Interval.</p> <p><password> – A case-sensitive password.</p> <p><key_id> – A previously configured MD5 key ID (1 to 255).</p> <p>metric <value> – This field allows the entry of a number between 1 and 65,535 that is representative of the OSPF cost of reaching the selected</p>

config ospf ipif

OSPF interface. The default metric is 1.

Restrictions

Only administrator-level users can issue this command.

Usage Example

To configure OSPF interface settings:

```
DES-6500:4#config ospf ipif System priority 2 hello_interval  
15 metric 2 state enabled
```

```
Command: config ospf ipif System priority 2 metric 2 state  
enabled hello_interval 15
```

```
Success.
```

```
DES-6500:4#
```

config ospf all

Purpose

Used to configure all of the OSPF interfaces on the switch at one time.

Syntax

```
config ospf all {area <area_id>/priority <value 0-255>/hello_interval  
<sec 1-65535>/dead_interval <sec 1-65535>/authentication  
[none/simple <password>/md5 <key_id>]/metric <value>/state  
[enabled/disabled]}
```

Description

This command is used to configure all of the OSPF interfaces on the switch, using a single group of parameters, at one time.

Parameters

priority <value 0-255> – The priority used in the election of the Designated Router (DR). A number between 0 and 255.

metric <value> – The interface metric (1 to 65535). Entering a 0 will allow automatic calculation of the metric.

hello_interval <sec 1-65535> – Allows the specification of the interval between the transmission of OSPF Hello packets, in seconds. Between 1 and 65535 seconds can be specified. The Hello Interval, Dead Interval, Authorization Type, and Authorization Key should be the same for all routers on the same network.

dead_interval <sec 1-65535> – Allows the specification of the length of time between the receipt of Hello packets from a neighbor router before the selected area declares that router down. An interval between 1 and 65535 seconds can be specified. The Dead Interval must be evenly divisible by the Hello Interval.

config ospf all

Parameters	<p><password> – A case-sensitive password.</p> <p><key_id> – A previously configured MD5 key ID (1 to 255).</p> <p>metric <value> – This field allows the entry of a number between 1 and 65,535 that is representative of the OSPF cost of reaching the selected OSPF interface. The default metric is 1.</p>
Restrictions	Only administrator-level users can issue this command.

Usage Example

To configure all of the OSPF interfaces on the switch with a single group of parameters:

```
DES-6500:4#config ospf all state enabled
Command: config ospf all state enabled

Success.

DES-6500:4#
```

show ospf ipif

Purpose	Used to display the current OSPF interface settings for the specified interface name.
Syntax	show ospf ipif {<ipif_name>}
Description	This command will display the current OSPF interface settings for the specified interface name.
Parameters	<ipif_name> – The IP interface name for which you want to display the current OSPF interface settings.
Restrictions	none.

Usage Example

To display the current OSPF interface settings, for a specific OSPF interface:

```
DES-6500:4#show ospf ipif ipif2
Command: show ospf ipif ipif2

Interface Name: ipif2          IP Address: 123.234.12.34/24 ((Link Up))
Network Medium Type: BROADCAST Metric: 1
Area ID: 1.0.0.0             Administrative State: Enabled
Priority: 1                   DR State: DR
DR Address: 123.234.12.34     Backup DR Address: None
Hello Interval: 10           Dead Interval: 40
Transmit Delay: 1            Retransmit Time: 5
Authentication: None

Total Entries: 1

DES-6500:4#
```

show ospf all

Purpose	Used to display the current OSPF settings of all the OSPF interfaces on the switch.
Syntax	show ospf all
Description	This command will display the current OSPF settings for all OSPF interfaces on the switch.
Parameters	none.
Restrictions	none.

Usage Example:

To display the current OSPF interface settings, for all OSPF interfaces on the switch:

```
DES-6500:4#show ospf all
Command: show ospf all
Interface Name: System          IP Address: 10.42.73.10/8 (Link Up)
Network Medium Type: BROADCAST Metric: 1
Area ID: 0.0.0.0              Administrative State: Enabled
Priority: 1                    DR State: DR
DR Address: 10.42.73.10       Backup DR Address: None
Hello Interval: 10            Dead Interval: 40
Transmit Delay: 1             Retransmit Time: 5
Authentication: None

Interface Name: ipif2          IP Address: 123.234.12.34/24 ((Link Up)
Network Medium Type: BROADCAST Metric: 1
Area ID: 1.0.0.0              Administrative State: Enabled
Priority: 1                    DR State: DR
DR Address: 123.234.12.34     Backup DR Address: None
Hello Interval: 10            Dead Interval: 40
Transmit Delay: 1             Retransmit Time: 5
Authentication: None

Total Entries: 2

DES-6500:4#
```

config ospf virtual_link

Purpose	Used to configure the OSPF virtual interface settings.
Syntax	config ospf virtual_link <area_id> <neighbor_id> {hello_interval <sec>/dead_interval <sec>/authentication [simple <password>/md5 <key_id>/none]}
Description	This command is used to configure the OSPF virtual interface settings.
Parameters	<p><area_id> – A 32-bit number in the form of an IP address (xxx.xxx.xxx.xxx) that uniquely identifies the OSPF area in the OSPF domain.</p> <p><neighbor_id> – The OSPF router ID for the remote area. This is a 32-bit number in the form of an IP address (xxx.xxx.xxx.xxx) that uniquely identifies the remote area's Area Border Router.</p> <p>hello_interval <sec> – Allows the specification of the interval between the transmission of OSPF Hello packets, in seconds. Between 1 and 65535 seconds can be specified. The Hello Interval, Dead Interval, Authorization Type, and Authorization Key should be the same for all routers on the same network.</p> <p>dead_interval <sec> – Allows the specification of the length of time</p>

config ospf virtual_link

between the receipt of Hello packets from a neighbor router before the selected area declares that router down. An interval between 1 and 65535 seconds can be specified. The Dead Interval must be evenly divisible by the Hello Interval.

<password> – A case-sensitive password.

<key_id> – A previously configured MD5 key. A value between 1 and 255 seconds can be entered.

Restrictions

Only administrator-level users can issue this command.

Usage Example

To configure the OSPF virtual interface settings:

```
DES-6500:4#config ospf virtual_link 10.1.1.2 20.1.1.1  
hello_interval 10
```

```
Command: config ospf virtual_link 10.1.1.2 20.1.1.1  
hello_interval 10
```

Success.

```
DES-6500:4#
```

create ospf virtual_link

Purpose

Used to create an OSPF virtual interface.

Syntax

```
create ospf virtual_link <area_id> <neighbor_id> {hello_interval  
<sec>/authentication [none/simple <password>/md5 <key_id>]}
```

Description

This command is used to create an OSPF virtual interface.

Parameters

<area_id> – A 32-bit number in the form of an IP address (xxx.xxx.xxx.xxx) that uniquely identifies the OSPF area in the OSPF domain.

<neighbor_id> – The OSPF router ID for the remote area. This is a 32-bit number in the form of an IP address (xxx.xxx.xxx.xxx) that uniquely identifies the remote area's Area Border Router. The router ID of the neighbor router.

hello_interval <sec> – Allows the specification of the interval between the transmission of OSPF Hello packets, in seconds. Between 1 and 65535 seconds can be specified. The Hello Interval, Dead Interval, Authorization Type, and Authorization Key should be the same for all routers on the same network.

create ospf virtual_link

Parameters	<p>dead_interval <sec> – dead_interval <sec> – Allows the specification of the length of time between the receipt of Hello packets from a neighbor router before the selected area declares that router down. An interval between 1 and 65535 seconds can be specified. The Dead Interval must be evenly divisible by the Hello Interval.</p> <p><password> – A case-sensitive password.</p> <p><key_id> – A previously configured MD5 key ID (1 to 255).</p>
Restrictions	Only administrator-level users can issue this command.

Usage Example

To create an OSPF virtual interface:

```
DES-6500:4#create ospf virtual_link 10.1.12 20.1.1.1
hello_interval 10
Command: create ospf virtual_link 10.1.12 20.1.1.1
hello_interval 10

Success.

DES-6500:4#
```

delete ospf virtual_link

Purpose	Used to delete an OSPF virtual interface.
Syntax	delete ospf virtual_link <area_id> <neighbor_id>
Description	This command will delete an OSPF virtual interface from the switch.
Parameters	<p><area_id> – A 32-bit number in the form of an IP address (xxx.xxx.xxx.xxx) that uniquely identifies the OSPF area in the OSPF domain.</p> <p><neighbor_id> – The OSPF router ID for the remote area. This is a 32-bit number in the form of an IP address (xxx.xxx.xxx.xxx) that uniquely identifies the remote area's Area Border Router. The router ID of the neighbor router.</p>
Restrictions	Only administrator-level users can issue this command.

Usage Example:

To delete an OSPF virtual interface from the switch:

```

DES-6500:4#delete ospf virtual_link 10.1.12 20.1.1.1
Command: delete ospf virtual_link 10.1.12 20.1.1.1

Success.

DES-6500:4#

```

show ospf virtual_link

Purpose	Used to display the current OSPF virtual interface configuration.
Syntax	show ospf virtual_link {<area_id> <neighbor_id>
Description	This command will display the current OSPF virtual interface configuration.
Parameters	<p><area_id> – A 32-bit number in the form of an IP address (xxx.xxx.xxx.xxx) that uniquely identifies the OSPF area in the OSPF domain.</p> <p><neighbor_id> – The OSPF router ID for the remote area. This is a 32-bit number in the form of an IP address (xxx.xxx.xxx.xxx) that uniquely identifies the remote area's Area Border Router. This is the router ID of the neighbor router.</p>
Restrictions	none.

Usage Example:

To display the current OSPF virtual interface configuration:

```

DES-6500:4#show ospf virtual_link

Transit   Virtual   Hello   Dead   Authentication   Link
Area ID   Neighbor Router Interval Interval          Status
-----
10.0.0.0  20.0.0.0    10     60     None             DOWN

Total Entries: 1

DES-6500:4#

```

JUMBO FRAME COMMANDS

Certain switches can support jumbo frames (frames larger than the standard Ethernet frame size of 1518 bytes). To transmit frames of up to 9K, the user can increase the maximum transmission unit (MTU) size from the default of 1522 by enabling the Jumbo Frame command.

The jumbo frame commands in the Command Line Interface (CLI) are listed (along with the appropriate parameters) in the following table.

Command	Parameters
enable jumbo_frame	
disable jumbo_frame	
show jumbo_frame	

enable jumbo_frame

Purpose	Used to enable the jumbo frame function on the switch.
Syntax	enable jumbo_frame
Description	This command will allow ethernet frames larger than 1518 bytes to be processed by the switch. The maximum size of the jumbo frame may not exceed 9K.
Parameters	None.
Restrictions	None.

Example usage:

To enable the jumbo frame function on the switch:

```
DES-6500:4#enable jumbo_frame
Command: enable jumbo_frame

Success.

DES-6500:4#
```

disable jumbo_frame

Purpose	Used to disable the jumbo frame function on the switch.
Syntax	disable jumbo_frame
Description	This command will disable the jumbo frame function on the switch.
Parameters	None.
Restrictions	None.

Example usage:

To enable the jumbo frame function on the switch:

```
DES-6500:4#enable jumbo_frame
Command: enable jumbo_frame

Success.

DES-6500:4#
```

show jumbo_frame

Purpose	Used to show the status of the jumbo frame function on the switch.
Syntax	show jumbo_frame
Description	This command will show the status of the jumbo frame function on the switch.
Parameters	None.
Restrictions	None.

Usage Example:

To show the jumbo frame status currently configured on the switch:

```
DES-6500:4#show jumbo_frame
Command: show jumbo_frame

Off.

DES-6500:4#
```

COMMAND HISTORY LIST

The Command History commands in the Command Line Interface (CLI) are listed (along with the appropriate parameters) in the following table.

Command	Parameters
?	
show command_history	
config command_history	<value 1-40>

Each command is listed, in detail, in the following sections.

?	
Purpose	Used to display all commands in the Command Line Interface (CLI).
Syntax	?
Description	This command will display all of the commands available through the Command Line Interface (CLI).
Parameters	None.
Restrictions	None.

Example usage

To display all of the commands in the CLI:

```

DES-6500:4#?
..
?
clear
clear arptable
clear counters
clear fdb
clear log
config 802.1p default_priority
config 802.1p user_priority
config 802.1x auth_mode
config 802.1x auth_parameter ports
config 802.1x auth_protocol
config 802.1x capability ports
config 802.1x init
config 802.1x reauth
config access profile profile_id
config account
CTRL+C ESC q Quit SPACE n Next Page Enter Next Entry a All

```

show command_history

Purpose	Used to display the command history.
Syntax	show command_history
Description	This command will display the command history.
Parameters	None.
Restrictions	None.

Example usage

To display the command history:


```

DES-6500:4#show command_history
Command: show command_history

?
? show
show vlan
config router_ports vlan2 add 1:1-1:10
config router_ports vlan2 add
config router_ports vlan2
config router_ports
show vlan
create vlan vlan2 tag 3
create vlan vlan2 tag 2
show router_ports
show router ports
login

DES-6500:4#

```

config command_history

Purpose	Used to configure the command history.
Syntax	config command_history <value>
Description	This command is used to configure the command history.
Parameters	<1-40> – the number of previously executed commands maintained in the buffer. Up to 40 of the latest executed commands may be viewed.
Restrictions	None.

Example usage

To configure the command history:

```

DES-6500:4#config command_history 20
Command: config command_history 20

Success.

DES-6500:4#

```


TECHNICAL SPECIFICATIONS

Physical and Environmental	
AC inputs & External Redundant Power Supply	100 - 240 VAC, 50/60 Hz (internal universal power supply)
Power Consumption:	288W
DC fans:	4 built-in 80 x 80 x25 mm fans
Operating Temperature:	0 to 40 degrees Celsius
Storage Temperature:	-25 to 55 degrees Celsius
Humidity:	Operating: 5% to 95% RH non-condensing Storage: 0% to 95% RH non-condensing
Dimensions:	441 mm x 207 mm x 44 mm (1U), 19 inch rack-mount width
Weight:	TBD
EMC:	EN55022 Class A
Safety:	CSA International

Performance	
Transmission Method:	Store-and-forward-L3 Routing
RAM Buffer:	128 MB per Linecard,256MB of CPU Card.
Filtering Address Table:	16 K MAC address per device
Packet Filtering/ Forwarding Rate:	Full-wire speed for all connections. 148,810 pps per port (for 100Mbps) 1,488,100 pps per port (for 1000Mbps)
MAC Address Learning:	Automatic update.
Forwarding Table Age Time:	Max age: 10 - 1000000 seconds. Default = 300.

General					
Standard	IEEE 802.3u 100BASE-TX Fast Ethernet IEEE 802.3ab 1000BASE-T Gigabit Ethernet IEEE 802.1 P/Q VLAN IEEE 802.3x Full-duplex Flow Control IEEE 802.3 Nway auto-negotiation				
Protocols	CSMA/CD				
Data Transfer Rates:	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; text-align: center;">Half-duplex</td> <td style="width: 50%; text-align: center;">Full-duplex</td> </tr> </table>	Half-duplex	Full-duplex		
Half-duplex	Full-duplex				
Ethernet					
Fast Ethernet	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; text-align: center;">10 Mbps</td> <td style="width: 50%; text-align: center;">20Mbps</td> </tr> </table>	10 Mbps	20Mbps		
10 Mbps	20Mbps				
Gigabit Ethernet	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; text-align: center;">100Mbps</td> <td style="width: 50%; text-align: center;">200Mbps</td> </tr> <tr> <td style="width: 50%; text-align: center;">1000Mbps</td> <td style="width: 50%; text-align: center;">2000Mbps</td> </tr> </table>	100Mbps	200Mbps	1000Mbps	2000Mbps
100Mbps	200Mbps				
1000Mbps	2000Mbps				
Fiber Optic	SFP (Mini GBIC) Support IEEE 802.3z 1000BASE-LX (DEM-310GT transceiver) IEEE 802.3z 1000BASE-SX (DEM-311GT transceiver) IEEE 802.3z 1000BASE-LH (DEM-314GT transceiver) IEEE 802.3z 1000BASE-ZX (DEM-315GT transceiver)				
Topology	Star				
Network Cables	UTP Cat.5, Cat.5 Enhanced for 1000Mbps UTP Cat.5 for 100Mbps UTP Cat.3, 4, 5 for 10Mbps EIA/TIA-568 100-ohm screened twisted-pair (STP)(100m)				