



DGS-3224TGR

Layer 2 Gigabit Ethernet Switch

Command Line Interface Reference Manual

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RECYCLABLE

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1

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:

- **9600 baud**
- **no parity**
- **8 data bits**
- **1 stop bit**

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.

```
DGS-3224TGR Gigabit Ethernet Switch Command Line Interface
                          Firmware: Build 3.01.018
Copyright(C) 2000-2003 D-LINK Corporation. All rights reserved.
UserName:
```

Figure 1-1. Initial Console screen

There is no initial username or password. Just press the **Enter** key twice to display the CLI input cursor – **DGS-3224TGR: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 or 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 that cannot be changed.

```
Boot Procedure V0.01.004
-----
Power On Self Test ..... 100 %
Please wait, loading Runtime image ..... 30 %_
```

Figure 1-2. Boot screen

The switch's MAC address can be found from the console program under the Switch Information menu item, as shown below. 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. By default, an IP interface named System is configured on the switch and contains all of the ports on the switch. The System interface can be used initially to assign a range of IP addresses to the switch. Later, when you configure VLANs and IP interfaces on the switch, the ports you assign to these VLANs and IP interfaces will be removed from the System interface. 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 **DGS-3224TGR:4#** – 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 **DGS3224TGR:4#** – enter the commands **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.

```
DGS-3224TGR Gigabit Ethernet Switch Command Line Interface
                          Firmware: Build 3.01.018
                          Copyright(C) 2000-2003 D-LINK Corporation. All rights reserved.
UserName:
Password:
DGS-3224TGR:4#config ipif System ipaddress 10.24.22.8/8
Command: config ipif System ipaddress 10.24.22.8/8

Success.

DGS-3224TGR:4#_
```

Figure 1-3. Assigning the Switch an IP Address

In the above example, the switch was assigned an IP address of 10.24.22.8 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.

2

USING THE CONSOLE CLI

The DGS-3224TGR 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 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**
- **9,600 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:

```

DGS-3224TGR Gigabit Ethernet Switch Command Line Interface
                          Firmware: Build 3.01.018
Copyright(C) 2000-2003 D-LINK Corporation. All rights reserved.
UserName:

```

Figure 2-1. Initial Console screen

Commands are entered at the command prompt, **DGS-3224TGR: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.

```

?
clear
clear arptable
clear counters
clear fdb
clear log
clear port_security_entry port
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
config arp_aging time
config authentication login
config authentication server_group
config authentication server_host
CTRL+C ESC  Quit SPACE  Next Page ENTER Next Entry  All _

```

Figure 2-2. The ? Command

The **dir** command has the same function as the ? command.

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

```
DGS-3224TGR:4#config account
Command: config account

Next possible completions:
  <username>

DGS-3224TGR: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.

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.

```
DGS-3224TGR:4#config account
Command: config account

Next possible completions:
  <username>

DGS-3224TGR: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.

```

DGS-3224TGR:4#help
Available commands:
.. ? clear config create delete
dir disable download enable login logout
ping reboot reset save show upload

DGS-3224TGR:4#

```

Figure 2-5. The Available Commands Prompt

The top-level commands consist of commands like **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.

```

DGS-3224TGR:4#show
Command: show

Next possible completions:
802.1p 802.1x access_profile account arprentry asymmetric_vlan
auth_diagnostics auth_session_statistics auth_statistics authentication

authentication_policy bandwidth_control certificate command_history
config error fdb gvrp hol_prevention igmp_snooping ipif iproute
jumbo_frame lacp_port link_aggregation log login_authentication mirror
multicast_fdb packet port_security ports radius realtime router_ports
scheduling scheduling_mechanism serial_port session sim snmp ssh ssl
stp switch syslog traffic traffic_segmentation trusted_host utilization

vlan

DGS-3224TGR: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.

3

COMMAND SYNTAX

The following symbols are used in this manual 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.

<angle brackets>	
Purpose	Encloses a variable or value that must be specified.
Example Syntax	config ipif System ipaddress <network_address>
Description	In the above syntax example, you must supply the network address in the <network_address> space. Do not type the angle brackets.
Example Command	config ipif System ipaddress 10.24.22.9/255.0.0.0

[square brackets]	
Purpose	Encloses a required value or set of required arguments. One or more values or arguments can be specified.
Example Syntax	create account [admin user]
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

 vertical bar	
Purpose	Separates two or more mutually exclusive items in a list – one of which must be entered.
Example Syntax	show snmp [community trap receiver detail]
Description	In the above syntax example, you must specify either community , trap receiver , or detail . Do not type the vertical bar.
Example Command	show snmp community

{braces}	
Purpose	Encloses an optional value or set of optional arguments.
Example Syntax	config igmp [<ipif_name> all] {version <value> query_interval <sec> max_response_time <sec> robustness_variable <value> last_member_query_interval <value> state [enabled disabled]}
Description	In the above syntax example, you must choose to enter an IP interface name in the <ipif_name> space or all , but version <value> , query_interval <sec> , max_response_time <sec> , robustness_variable <value> , last_member_query_interval <value> , and state [enabled disabled] are all optional arguments. You can specify any or all of the arguments contained by braces. Do not type the braces.
Example command	config igmp all version 2

Line Editing Key Usage

Delete	Deletes character under the cursor and then shifts the remaining characters in the line to the left.
Backspace	Delete the character to the left of the cursor and shifts the remaining characters in the line to the left.
Insert	Can be toggled on or off. When toggled on, inserts text at the current cursor position and shifts the remainder of the line to the left.
Left Arrow	Moves the cursor to the left.
Right Arrow	Moves the cursor to the right.
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 displaying.
a	Displays the remaining pages without pausing between pages.
Enter	Displays the next line or table entry.

4

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 serial_port	
config serial_port	{baud_rate [9600 19200 38400 115200] auto_logout(2) [never(0) 2_minutes(2) 5_minutes(5) 10_minutes(10) 15_minutes(15)]}(1)
enable jumbo_frame	
disable jumbo_frame	
show jumbo_frame	
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	
config realtime date	<date ddmthyyy> <time hour:min:sec>
show realtime	
show config	[dram flash]

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

create account

Purpose	Used to create user accounts
Syntax	create account [admin user] <username>
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 eight user accounts can be created.
Parameters	<i>admin</i> <username> <i>user</i> <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:

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

```
DGS-3224TGR:4#create account admin dlink
Command: create account admin dlink

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

DGS-3224TGR:4#
```

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 15 characters.

Example Usage:

To configure the user password of “dlink” account:

```
DGS-3224TGR: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.

DGS-3224TGR:4#
```

show account

Purpose	Used to display user accounts
Syntax	show account
Description	Displays all user accounts created on the switch. Up to eight user accounts can exist on the switch at one time.
Parameters	None.
Restrictions	None.

Example Usage:

To display the accounts that have been created:

```
DGS-3224TGR:4#show account
Command: show account

Current Accounts:
  Username      Access Level
  -----      -
  System        user
  dlink         Admin

DGS-3224TGR: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":

```
DGS-3224TGR:4#delete account System
Command: delete account System
```

```
Success.
```

```
DGS-3224TGR: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	None.

Example Usage:

To display the way that the users logged in:

```
DGS-3224TGR:4#show session
Command: show session
```

ID	Login Time	Live Time	From	Level	Name
0	2004/09/03 13:34:24	00:01:13	172.18.212.199	4	Anonymous
1	2004/09/03 13:35:19	00:00:18	Serial Port	4	Anonymous
8	2004/09/03 13:04:26	00:31:11	Serial Port	4	Anonymous

```
Total Entries: 3
```

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:

```

DGS-3224TGR:4#sh sw
Command: show switch

Device Type       : DGS-3224TGR Gigabit-Ethernet Switch
MAC Address       : 00-01-02-03-04-00
IP Address        : 10.90.90.90 (Manual)
VLAN Name         : default
Subnet Mask       : 255.0.0.0
Default Gateway   : 0.0.0.0
Boot PROM Version: Build 0.01.004
Firmware Version  : Build 0.03.018
Hardware Version  : 2A1
System Name       :
System Location   :
System Contact    :
Spanning Tree     : Disabled
GVRP              : Disabled
IGMP Snooping    : Disabled
TELNET            : Enabled(TCP 23)
SSH               : Enabled(TCP 22)
WEB               : Enabled(TCP 80)
RMON              : Disabled
RPS State         : Inactive

DGS-3224TGR: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:

```

DGS-3224TGR:4#show serial_port
Command: show serial_port

Baud Rate       : 9600
Data Bits       : 8
Parity Bits     : None
Stop Bits       : 1
Auto-Logout     : 10 mins

DGS-3224TGR:4#

```

config serial_port

Purpose	Used to configure the serial port.
Syntax	config serial_port {baud_rate[9600 19200 38400 115200] 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><i>[9600 19200 38400 115200]</i> – The serial bit rate that will be used to communicate with the management host.</p> <p><i>never</i> – No time limit on the length of time the console can be open with no user input.</p> <p><i>2_minutes</i> – The console will log out the current user if there is no user input for 2 minutes.</p> <p><i>5_minutes</i> – The console will log out the current user if there is no user input for 5 minutes.</p> <p><i>10_minutes</i> – The console will log out the current user if there is no user input for 10 minutes.</p> <p><i>15_minutes</i> – 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 baud rate:

```
DGS-3224TGR:4#config serial_port baud_rate 9600
Command: config serial_port baud_rate 9600

Success.

DGS-3224TGR:4#
```

enable jumbo_frame

Purpose	Used to enable support for Jumbo Frames.
Syntax	enable jumbo_frame
Description	This command is used to enable support for Jumbo Frames up to 9216 bytes.
Parameters	None.
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To enable jumbo frame support on the switch:

```
DGS-3224TGR:4#enable jumbo_frame
Command: enable jumbo_frame

Success.

DGS-3224TGR:4#
```

disable jumbo_frame

Purpose	Used to disable support for Jumbo Frames.
Syntax	disable jumbo_frame
Description	This command is used to disable support for Jumbo Frames of up to 9216 bytes.
Parameters	None.
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To disable jumbo frame support on the switch:

```
DGS-3224TGR:4#disable jumbo_frame
Command: disable jumbo_frame

Success.

DGS-3224TGR:4#
```

show jumbo_frame

Purpose	Used to display whether support for Jumbo Frames is currently enabled.
Syntax	show jumbo_frame
Description	This command is used to display whether support for Jumbo Frames of up to 9216 bytes is enabled.
Parameters	None.
Restrictions	None.

Example Usage:

To display jumbo frame support on the switch:

```
DGS-3224TGR:4#show jumbo_frame
Command: show jumbo_frame

On.

DGS-3224TGR: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 will cause the console screen to rapidly scroll through several pages. This command will cause the console to pause at the end of each page. The 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 show command output reaches the end of the page:

```
DGS-3224TGR:4#enable clipaging
Command: enable clipaging

Success.

DGS-3224TGR:4#
```

disable clipaging

Purpose	Used to disable the pausing of the console screen scrolling at the end of each page when the show command would display 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:

```
DGS-3224TGR:4#disable clipaging
Command: disable clipaging

Success.

DGS-3224TGR:4#
```

enable telnet

Purpose	Used to enable communication with and management of the switch using the Telnet protocol.
Syntax	enable telnet <tcp_port_number>
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> – 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:

```
DGS-3224TGR:4#enable telnet 23
Command: enable telnet 23

Success.

DGS-3224TGR: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:

```
DGS-3224TGR:4#disable telnet
Command: disable telnet

Success.

DGS-3224TGR:4#
```

enable web

Purpose	Used to enable the HTTP-based management software on the switch.
Syntax	enable web <tcp_port_number>
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> – The TCP port number. TCP ports are numbered between 1 and 65,535. 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:

```
DGS-3224TGR:4#enable web 80
Command: enable web 80

Success.

DGS-3224TGR: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.
Parameters	None.
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To disable HTTP:

```
DGS-3224TGR:4#disable web
Command: disable web

Success.

DGS-3224TGR: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:

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

```
DGS-3224TGR:4#save
Command: save

Saving all settings to NV-RAM... 100%
done.
DGS-3224TGR:4#
```

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:

```
DGS-3224TGR: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><i>config</i> – If config is specified, all of the factory default settings are restored on the switch except for the IP address and user accounts.</p> <p><i>system</i> – If system is specified all of the factory default settings are restored on the switch.</p> <p>If no parameter is specified, the switch's current IP address, user accounts, and switch history log are retained. All other parameters are restored to their factory default settings.</p>
Restrictions	Only administrator-level users can issue this command.

Example Usage:

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

```
DGS-3224TGR:4#reset config
Command: reset config

Success.

DGS-3224TGR: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:

```
DGS-3224TGR: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:

```
DGS-3224TGR:4#logout
```

config realtime date

Purpose	Used to configure the date and time on the switch.
Syntax	config realtime date <date ddmthyyyy> <time hour:min:sec>
Description	This command is used to set the date and time on the switch.
Parameters	<i><date ddmthyyyy></i> – Use this format for setting the date. <i><time hour:min:sec></i> – Use this format for setting the time.
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To configure the date:

```
DGS-3224TGR:4#config realtime date 23sep2003 10:59:30
Command: config realtime date 23sep2003 10:59:30

Success.

DGS-3224TGR:4#
```

show realtime

Purpose	Used to display the date and time on the switch.
Syntax	show realtime
Description	This command is used to display the date and time on the switch.
Parameters	None.
Restrictions	None.

Example Usage:

To display the date:

```
DGS-3224TGR:4#show realtime
Command: show realtime

The current time : 2003/09/23 11:00:59

DGS-3224TGR:4#
```

show config

Purpose	Used to collect and show all system configurations in a single CLI command.
Syntax	show config [dram flash]
Description	This command displays all system configurations. The continuous display configuration can be aborted by an interrupt key, which may be a sequential keying process or a single key. The display format should be the same as the CLI configuration command.
Parameters	<p><i>dram</i> – Show system configuration from DRAM database. This is the current system setting.</p> <p><i>flash</i> – Show system configuration from NVRAM.</p>
Restrictions	Only administrator-level users can issue this command.

Example usage:

To show all system configurations from DRAM database:

```
DGS-3224TGR:4#show config dram
Command: show config dram

# BASIC

config serial_port baud_rate 9600 auto_logout 10_minutes
enable telnet 23
enable web 80
disable jumbo_frame

# STP

config stp maxage 20 hellotime 2 dorwarddelay 15 priority 32768 version rstp
txholdcount 3 fbpdu enabled
disable stp
config stp ports 1-24 cost auto priority 128 edge false p2p auto state enabled

# LACP

config link_aggregation algorithm mac_source
config lacp_port 1-24 mode passive

# STORM

config traffic control 1-24 broadcast disable threshold

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

5**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]}] flow_control [enable disable] learning [enable disable] state [enable disable] description <string 32> clear]
show ports	<portlist> {description}

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

config ports

Purpose	Used to configure the Switch's Ethernet port settings.
Syntax	[<portlist all> [speed [auto 10_half 10_full 100_half 100_full 1000_full {[master slave]}] flow_control [enable disable] learning [enable disable] state [enable disable] description <string 32> clear]
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><i>all</i> – Configure all ports on the Switch.</p> <p><i><portlist></i> – Specifies a range of ports to be configured. The port list is specified by listing the beginning port number and the highest port number of the range. The beginning and end of the port list range are separated by a dash. For example, 3 specifies port 3. 4 specifies port 4. 3-4 specifies all of the ports between port 3 and port 4 – in numerical order.</p> <p><i>auto</i> – Enables auto-negotiation for the specified range of ports.</p> <p><i>[10 100 1000]</i> – Configures the speed in Mbps for the specified range of ports.</p> <p><i>[half full]</i> – Configures the specified range of ports as either full- or half-duplex.</p> <p><i>[master slave]</i> – The <i>master</i> and <i>slave</i> parameters refer to connections running a 1000BASE-T cable for connection between the Switch port and other device capable of a gigabit connection. The <i>master</i> setting will allow the port to advertise capabilities related to duplex, speed and physical layer type. The <i>master</i> setting will also determine the master and slave relationship between the two connected physical layers. This relationship is necessary for establishing the timing control between the two physical layers. The timing control is set on a <i>master</i> physical layer by a local source. The <i>slave</i> setting uses loop timing, where the timing comes from a data stream received from the <i>master</i>. If one connection is set for <i>1000 master</i>, the other side of the connection must be set for <i>1000 slave</i>. Any other configuration will result in a link down status for both ports.</p> <p><i>flow_control [enable disable]</i> – Enable or disable flow control for the specified ports.</p> <p><i>learning [enable disable]</i> – Enables or disables the MAC address learning on the specified range of ports.</p> <p><i>state [enable disable]</i> – Enables or disables the specified range of ports.</p> <p><i>description <string 32></i> - Enter an alphanumeric string of no more than 32 characters to describe a selected port interface.</p> <p><i>clear</i> – Enter this command to clear the port description of the selected port(s).</p>
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To configure the speed of the ports 1 to 3 to be 10 Mbps, full duplex, learning, and state enabled:

```
DGS-3224TGR:4#config ports 1-3 speed 10_full learning enable state enable
Command: config ports 1-3 speed 10_full learning enable state enable
```

```
Success.
```

show ports

Purpose	Used to display the current configuration of a range of ports.
Syntax	show ports <portlist> {description}
Description	This command is used to display the current configuration of a range of ports.
Parameters	<p><portlist> – Specifies a range of ports to be displayed. The port list is specified by listing the beginning port number and the highest port number of the range. The beginning and end of the port list range are separated by a dash. For example, 3 specifies port 3. 4 specifies port 4. 3-4 specifies all of the ports between port 3 and port 4 – in numerical order.</p> <p>{description} – Adding this parameter to the command will allow the user to view previously configured description set on various ports on the Switch.</p>
Restrictions	None.

Example Usage:

To display the configuration of the ports 1-7:

```
DGS-3224TGR:4#show ports 1-7
```

Port	Port State	Settings Speed/Duplex/FlowCtrl	Connection Speed/Duplex/FlowCtrl	Address Learning
1	Enabled	Auto/Disabled	Link Down	Enabled
2	Enabled	Auto/Disabled	Link Down	Enabled
3	Enabled	Auto/Disabled	Link Down	Enabled
4	Enabled	Auto/Disabled	Link Down	Enabled
5	Enabled	Auto/Disabled	Link Down	Enabled
6	Enabled	Auto/Disabled	Link Down	Enabled
7	Enabled	Auto/Disabled	Link Down	Enabled

Example usage;

To display port descriptions:

```
DGS-3224TGR:4#show ports 1 description
Command: show ports 1 description
```

Port	Port State	Settings Speed/Duplex/FlowCtrl	Connection Speed/Duplex/FlowCtrl	Address Learning
1	Enabled	Auto/Disabled	100M/Full/None	Enabled
	Description: Accounting			

6

NETWORK MANAGEMENT COMMANDS

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

Command	Parameters
create snmp community	<community_string 32> view <view_name> [read_only read_write]
delete snmp community	<community_string>
enable rmon	
disable rmon	
config snmp system_contact	<sw_contact>
enable snmp traps	
disable snmp traps	
enable snmp authenticate traps	
disable snmp authenticate traps	
show trusted_hosts	<ipaddr>
ping	<ipaddr> times <value> timeout <sec>
create snmp user	<username 32> <groupname 32> {encrypted(1) [by_password auth [md5 <auth_password 8-16> sha(3) <auth_password 8-20>] priv [none des <priv_password 8-16>] by_key auth [md5 <auth_key 32-32> sha(3) <auth_key 40-40>] priv [none des <priv_key 32-32>]]}
delete snmp user	<username 32>
create snmp view	<view_name 32> [all <oid>]
delete snmp view	<view_name 32> <oid> view_type[included(1 excluded)

Command	Parameters
create snmp view	<view_view 32> [all <oid>]
config snmp engineID	<snmp_engineID 10-64>
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	<goupname 32>
create snmp host	<ipaddr> [v1 v2c v3 [noauth_nopriv auth_nopriv auth_priv]] <auth_string 32>
delete snmp host	<ipaddr>
show snmp engineID	
show snmp groups	
show snmp user	
show snmp view	{<view_name 32>}
show snmp community	{<community_string 32>}
show snmp host	{ipaddr>}
show snmp traps	
create trusted_host	<ipaddr>
delete trusted_host	<ipaddr>
config snmp system_name	<sw_name>
config snmp system_location	<sw_location>

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

create snmp community

Purpose	Used to create an SNMP community string.
Syntax	create snmp community <community_string 32> view <view_name> [read_only read_write]
Description	This command is used to create an SNMP community string and to specify the string as enabling read only or read-write privileges for the SNMP management host.
Parameters	<p><i><community_string 32></i> – An alphanumeric string of up to 32 characters used to authentication of users wanting access to the switch’s SNMP agent.</p> <p><i><view_name></i> – An alphanumeric string of up to 32 characters that identifies the SNMP view that will be created.</p> <p><i>read_only</i> – Allows the user using the above community string to have read only access to the switch’s SNMP agent. The default read only community string is public.</p> <p><i>read_write</i> – Allows the user using the above community string to have read and write access to the switch’s SNMP agent. The default read write community string is private.</p>
Restrictions	Only administrator-level users can issue this command. A maximum of four community strings can be specified.

Example Usage:

To create a read-only level SNMP community “System”:

```
DGS-3224TGR:4#create snmp community System
readwrite
Command: create snmp community System readwrite

Success.

DGS-3224TGR:4#
```

delete snmp community

Purpose	Used to delete an SNMP community string previously entered on the switch.
Syntax	delete snmp community <community_string 32>
Description	This command is used to delete an SNMP community string entered on the switch using the create snmp community command above.
Parameters	<i><community_string 32></i> – An alphanumeric string of up to 32 characters used to authentication of users wanting access to the switch’s SNMP agent.
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To delete a read-only level SNMP community “System”:

```
DGS-3224TGR:4#delete snmp community System
Command: delete snmp community System
```

```
Success.
```

```
DGS-3224TGR: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.
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:

```
DGS-3224TGR:4#delete trusted_host 10.48.74.121
Command: delete trusted_host 10.48.74.121
```

```
Success.
```

```
DGS-3224TGR:4#
```

config snmp system_name

Purpose	Used to configure a name for the switch.
Syntax	config snmp system_name <sw_name>
Description	This command is used to give the switch an alpha-numeric name of up to 128 characters.
Parameters	<sw_name> – An alpha-numeric name for the switch of up to 128 characters.
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To configure the switch name for “DGS3224TGR”:

```
DGS-3224TGR:4#config snmp system_name DGS3224TGR
Command: config snmp system_name DGS3224TGR
```

```
Success.
```

```
DGS-3224TGR: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	This command is used to enter a description of the location of the switch. A maximum of 128 characters can be used.
Parameters	<sw_location> – A description of the location of the switch. A maximum of 128 characters can be used.
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To configure the switch location for “Timbuktu”:

```
DGS-3224TGR:4#config snmp system_location Timbuktu
Command: config snmp system_location Timbuktu

Success.

DGS-3224TGR: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	This 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 128 character can be used.
Parameters	<sw_contact> – A maximum of 128 characters used to identify a contact person who is responsible for the switch.
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To configure the switch contact to “dlink”:

```
DGS-3224TGR:4#config snmp system_contact dlink
Command: config snmp system_contact dlink

Success.

DGS-3224TGR: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:

```
DGS-3224TGR:4#enable rmon
Command: enable rmon

Success.

DGS-3224TGR: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:

```
DGS-3224TGR:4#disable rmon
Command: disable rmon

Success.

DGS-3224TGR: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
Description	This command is used to display a list of trusted hosts entered on the switch using the create trusted_host command above.
Parameters	None.
Restrictions	None.

Example Usage:

To display the list of trust hosts:

```
DGS-3224TGR:4#show trusted_host
Command: show trusted_host

Management Stations

IP Address
-----

Total Entries   : 0

DGS-3224TGR:4#
```

enable snmp traps

Purpose	Used to enable SNMP trap support.
Syntax	enable snmp traps
Description	This 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 turn on SNMP trap support:

```
DGS-3224TGR:4#enable snmp traps
Command: enable snmp traps

Success.

DGS-3224TGR:4#
```

disable snmp traps

Purpose	Used to disable SNMP trap support on the switch.
Syntax	enable 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:

```
DGS-3224TGR:4#disable snmp traps
Command: disable snmp traps

Success.

DGS-3224TGR: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:

```
DGS-3224TGR:4#enable snmp authenticate traps
Command: enable snmp authenticate traps

Success.

DGS-3224TGR: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 turn off SNMP authentication trap support:

```
DGS-3224TGR:4#disable snmp authenticate traps
Command: disable snmp authenticate traps

Success.

DGS-3224TGR:4#
```

ping

Purpose	Used to test the connectivity between network devices.
Syntax	ping <ipaddr> {times <value>} {timeout <sec>}
Description	This 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><i><ipaddr></i> – The IP address of the remote device.</p> <p><i>times <value></i> – 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><i>timeout <sec></i> – 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	Only administrator-level users can issue this command.

Example Usage:

To send ICMP echo message to “10.48.74.121” for 4 times:

```
DGS-3224TGR: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

DGS-3224TGR:4#
```

7

DOWNLOAD/UPLOAD 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 <ipaddr> <path_filename> configuration <ipaddr> <path_filename> {increment}
upload	configuration log <ipaddr> <path_filename>

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 <ipaddr> <path_filename> configuration <ipaddr> <path_filename> {increment}]
Description	This command is used to download a new firmware or a switch configuration file from a TFTP server.
Parameters	<p><i>firmware</i> – Download and install new firmware on the switch from a TFTP server.</p> <p><i>configuration</i> – Download a switch configuration file from a TFTP server.</p> <p><i><ipaddr></i> – The IP address of the TFTP server.</p> <p><i><path_filename></i> – The DOS path and filename of the firmware or switch configuration file on the TFTP server. For example, C:\3224tgr.had.</p> <p><i>increment</i> – Allows the download of a partial switch configuration file. This allows a file to be downloaded that will change only the switch parameters explicitly stated in the configuration file. All other switch parameters will remain unchanged.</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:

```
DGS-3224TGR:4#download configuration 10.48.74.121 c:\cfg\setting.txt
Command: download configuration 10.48.74.121 c:\cfg\setting.txt

Connecting to server..... Done.
Download configuration..... Done.
DGS-3224TGR:4#
```

upload

Purpose	Used to upload the current switch settings or the switch history log to a TFTP server.
Syntax	upload [configuration log] <ipaddr> <path_filename>
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><i>configuration</i> – Specifies that the switch's current settings will be uploaded to the TFTP server.</p> <p><i>log</i> – Specifies that the switch history log will be uploaded to the TFTP server.</p> <p><<i>ipaddr</i>> – The IP address of the TFTP server. The TFTP server must be on the same IP subnet as the switch.</p> <p><<i>path_filename</i>> – 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:

```
DGS-3224TGR:4#upload configuration 10.48.74.121
c:\cfg\log.txt
Command: upload configuration 10.48.74.121
c:\cfg\log.txt

Connecting to server..... Done.
Upload configuration.....Done.
DGS-3224TGR:4#
```

8

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	[cpu ports]
clear counters	ports <portlist>
clear log	
show log	index <value>
enable syslog	
disable syslog	
show syslog	
config syslog	{host(1) [all <index 1-4>]}(1) { severity(2) [informational(21) local1(22) local2(23) local3(24) local4(25) local5(26) local6(27) local7(28)] udp_port(3) <int> ipaddress(4) <ipaddr> state(5) [enabled(51) disabled(52)]}
delete syslog host	[<index 1-4> all]
show syslog host	[index 1-4>]

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 configured. The port list is specified by listing the beginning port number and the highest port number of the range. 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.
Restrictions	None.

Example Usage:

To display the packets analysis for port 7:

```
DGS-3224TGR:4# show packet ports 7
Command: show packet ports 7
```

Port number : 7					
Frame Size	Frame Counts	Frames/sec	Frame Type	Total	Total/sec
64	3275	10	RX Bytes	408973	1657
65-127	755	10	RX Frames	4395	19
128-255	316	1			
256-511	145	0	TX Bytes	7918	178
512-1023	15	0	TX Frames	111	2
1024-1518	0	0			
Unicast RX	152	1			
Multicast RX	557	2			
Broadcast RX	3686	16			
Broadcast RX	4495	42			

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 configured. The port list is specified by listing the beginning port number and the highest port number of the range. 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.
Restrictions	None.

Example Usage:

To display the errors of the port 3:

```
DGS-3224TGR:4# show error ports 3
Command: show error ports 3

Port number : 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 Collission	0
Drop Pkts	0	Collision	0

show utilization

Purpose	Used to display real-time port and cpu utilization statistics.
Syntax	show utilization [cpu ports]
Description	This command will display the real-time port and cpu utilization statistics for the Switch.
Parameters	<i>cpu</i> – Entering this parameter will display the current cpu utilization of the Switch, as a percentage. <i>ports</i> - Entering this parameter will display the current utilization of all ports on the Switch.
Restrictions	None.

Example Usage:

To display the port utilization statistics:

```
DGS-3224TGR:4# show utilization ports
Command: show utilization ports
```

Port	TX sec	RX sec	Util	Port	TX sec	RX sec	Util
1	0	0	0	22	0	0	0
2	0	0	0	23	0	0	0
3	0	0	0	24	0	0	0
4	0	0	0				
5	0	0	0				
6	0	0	0				
7	0	0	0				
8	0	0	0				
9	0	0	0				
10	0	0	0				
11	0	0	0				
12	0	0	0				
13	0	0	0				
14	0	0	0				
15	0	0	0				
16	0	0	0				
17	0	0	0				
18	0	0	0				
19	0	0	0				
20	0	0	0				
21	0	0	0				

To display the CPU utilization:

```
DGS-3224TGR:4# show utilization cpu
Command: show utilization cpu

CPU utilization :
-----
Five seconds – 48%   One minute – 46%   Five minutes – 50%
DGS-3224TGR:4#
```

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 beginning port number and the highest port number of the range. 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.
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To clear the counters:

```
DGS-3224TGR:4#clear counters ports 7-9
```

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

```
Success.
```

```
DGS-3224TGR:4#
```

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:

```
DGS-3224TGR:4#clear log
```

```
Command: clear log
```

```
Success.
```

```
DGS-3224TGR:4#
```

show log

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

Example Usage:

To display the switch history log:

```
DGS-3224TGR:4# show log
Command: show log
```

Index	Time	Log Text
8	2003/09/18 09:03:45	Successful login through Console (Username: Anonymous)
7	2003/09/18 09:03:30	Logout through Console (Username: Anonymous)
6	2003/09/18 09:03:28	Successful login through Console (Username: Anonymous)
5	2003/09/18 09:03:26	System started up
4	2003/09/18 16:13:39	Port 1 link down
3	2003/09/18 16:13:38	System started up
2	2003/09/18 16:13:36	Spanning Tree Protocol is disabled
1	2003/09/18 16:13:35	Port 9 link up, 100Mbps FULL duplex

```
DGS-3224TGR:4#
```

9

SPANNING TREE COMMANDS

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> version [rstp stp] txholdcount <value 1-10> fbpdu [enable disable]}
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 configure Bridge management parameters for STP on the switch.
Syntax	config stp {maxage <value 6-40> hellotime <value 1-10> forwarddelay <value 4-30> priority <value 0-61440> version [rstp stp] txholdcount <value 1-10> fbpdu [enabled disabled]}
Description	This command is used to setup the Spanning Tree Protocol (STP) for the entire switch.
Parameters	<p><i>maxage</i> <value 6-40> – The maximum amount of time (in seconds) that the switch will wait to receive a BPDU packet before reconfiguring STP. The default is 20 seconds.</p> <p><i>hellotime</i> <value 1-10> – The time interval between transmission of configuration messages by the root device. The default is 2 seconds.</p> <p><i>forwarddelay</i> <value 4-30> – The maximum amount of time (in seconds) that the root device will wait before changing states. The default is 15 seconds.</p> <p><i>priority</i> <value 0-61440> – A numerical value between 0 and 61,440 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.</p> <p><i>version</i> [rstp stp] – Allows the selection of either Rapid Spanning Tree or regular STP.</p> <p><i>fbpdu</i> [enabled disabled] – Allows the forwarding of STP BPDU packets from other network devices when STP is disabled on the switch. The default is enabled.</p>
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To set maxage to 18 and hellotime to 4:

```
DGS-3224TGR:4#config stp maxage 18 hellotime 4
Command: config stp maxage 18 hellotime 4

Success.

DGS-3224TGR: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 auto] state [enable disable]}
Description	This command is used to create and configure STP for a group of ports.
Parameters	<p><i><portlist></i> – Specifies a range of ports to be configured. The port list is specified by listing the beginning port number and the highest port number of the range. 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><i>cost [auto <value 1-200000000>]</i> – This defines a metric that indicates the relative cost of forwarding packets to the specified port list. The default cost for a 1000 Mbps port is 20,000, a 100 Mbps port is 200,000, and for a 10 Mbps port the default cost is 2,000,000.</p> <p><i>priority <value 0-240></i> – A numeric value between 0 and 240 that is used in determining the root and designated port in an STP port list. The default is 128, with 0 indicating the highest priority.</p> <p><i>migrate [yes no]</i> – 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.</p> <p><i>edge [true false]</i> – 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 the port does not have edge port status.</p> <p><i>p2p [true false auto]</i> – The administrative point-to-point status of the LAN segment attached to this port. A value of true indicates that this port should always be treated as if it is connected to a point-to-point link. A value of false indicates that this port should be treated as having a shared media connection. A value of auto indicates that this port is considered to have a p2p link if it is an aggregator and all of its members are aggregatable, or if the MAC entity is configured for full duplex operation, either through auto-negotiation or by management means.</p> <p><i>state [enable disable]</i> – Allows STP to be enabled or disabled for the ports specified in the port list. The default is disabled.</p>
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To set the path cost 19, the priority 15, and the state enabled of the ports 1-5:

```
DGS-3224TGR:4#config stp ports 1-5 cost 19 priority 15 state enabled
Command: config stp ports 1-5 cost 19 priority 15 state enabled

Success.

DGS-3224TGR: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 on the switch:

```
DGS-3224TGR:4#enable stp
Command: enable stp

Success.

DGS-3224TGR: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:

```
DGS-3224TGR:4#disable stp
Command: disable stp

Success.

DGS-3224TGR: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:

Status 1: STP enabled

```
DGS-3224TGR: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          : RSTP
TX Hold Count        : 3
Forwarding BPDU      : Enabled

Designated Root Bridge : 00-00-00-12-00-00
Root Priority         : 32768
Cost to Root         : 19
Root Port            : 33
Last Topology Change : 13sec
Topology Changes Count : 0
Protocol Specification : 3
Max Age              : 20
Hello Time           : 2
Forward Delay        : 15
Hold Time            : 3
```

Status 2: STP disabled

```
DGS-3224TGR:4#show stp
Command: show stp

STP Status           : Disabled
Max Age              : 18
Hello Time           : 4
Forward Delay        : 15
Priority              : 32768
Default Path Cost    : 802.1T
STP Version          : RSTP
TX Hold Count        : 3
Forwarding BPDU      : Enabled

DGS-3224TGR: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 beginning port number and the highest port number of the range. 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.
Restrictions	None

Example Usage:

To display STP state of port 1-2:

DGS-3224TGR:4#show stp ports 1-2								
Command: show stp ports 1-2								
Port	Connection	State	Cost	Pri	Edge	P2P	Status	Role
1	100M/Full/None	Yes	*200000	128	No	Yes	Forwarding	NonStp
2	Link Down	Yes	*200000	128	No	Yes	Disabled	Disabled

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LAYER 2 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> <macaddr> port <port>
create multicast_fdb	<vlan_name> <macaddr>
config multicast_fdb	<vlan_name> <macaddr> [add delete] <portlist>
delete fdb	<vlan_name> <macaddr> [add delete] <portlist>
clear fdb	vlan <vlan_name> port <port> all
show multicast_fdb	vlan <vlan_name> mac_address <macaddr>
show fdb	port <port> vlan <vlan_name> mac_address <macaddr> static aging_time
config fdb aging_time	<sec 10-1000000>

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> <macaddr> [port <port>]
Description	This command will make an entry into the switch's unicast MAC address forwarding database.
Parameters	<p><vlan_name> – 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.</p>
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To create an unicast MAC forwarding:

```
DGS-3224TGR:4#create fdb default 00-00-00-00-01-02
port 5
Command: create fdb default 00-00-00-00-01-02 port 5

Success.
```

create multicast_fdb

Purpose	Used to create a static entry to the multicast MAC address forwarding table (database)
Syntax	create multicast_fdb <vlan_name> <macaddr>
Description	This command will make an entry into the switch's multicast MAC address forwarding database.
Parameters	<p><vlan_name> – 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>
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To create multicast MAC forwarding:

```
DGS-3224TGR:4# create multicast_fdb default 01-00-5E-00-00-00
Command: create multicast_fdb default 01-00-5E-00-00-00

Success.

DGS-3224TGR:4#
```

config multicast_fdb

Purpose	Used to configure the switch's multicast MAC address forwarding database.
Syntax	config multicast_fdb <vlan_name> <macaddr> [add delete] <portlist>
Description	This command configures the multicast MAC address forwarding table.
Parameters	<p><i><vlan_name></i> – The name of the VLAN on which the MAC address resides.</p> <p><i><macaddr></i> – The MAC address that will be added to the forwarding table.</p> <p><i>[add delete]</i> – Add will add the following ports to the MAC address's forwarding port, delete will remove the MAC address from the forwarding port.</p> <p><i><portlist></i> – Specifies a range of ports to be configured. The port list is specified by listing the beginning port number and the highest port number of the range. 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>
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To add multicast MAC forwarding:

```
DGS-3224TGR:4# config multicast_fdb default 01-00-5E-00-00-00 add 1-5
Command: config multicast_fdb default 01-00-5E-00-00-00 add 1-5

Success.

DGS-3224TGR:4#
```

delete fdb

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

Example Usage:

To delete a permanent FDB entry:

```
DGS-3224TGR:4#delete fdb default 00-00-00-00-01-02
Command: delete fdb default 00-00-00-00-01-02

Success.

DGS-3224TGR:4#
```

clear fdb

Purpose	Used to clear the switch's forwarding database of all dynamically learned MAC addresses.
Syntax	clear fdb [vlan <vlan_name> port <port> all]
Description	This command is used to clear dynamically learned entries to the switch's forwarding database.
Parameters	<p><vlan_name> – 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.</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:

```
DGS-3224TGR:4#clear fdb all
Command: clear fdb all

Success.

DGS-3224TGR:4#
```

show multicast_fdb

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

Example Usage:

To display multicast MAC address table:

```
DGS-3224TGR:4#show multicast_fdb
Command: show multicast_fdb

VLAN Name      : default
MAC Address    : 01-00-5E-00-00-00
Egress Ports   : 1-5, 21, 22
Mode           : Static

Total Entries  : 1

DGS-3224TGR:4#
```

show fdb

Purpose	Used to display the current unicast MAC address forwarding database.
Syntax	show fdb {port <port> vlan <vlan_name> mac_address <macaddr> static aging_time}
Description	This command will display the current contents of the switch's forwarding database.
Parameters	<p><port> – The port number corresponding to the MAC destination address. The switch will always forward traffic to the specified device through this port.</p> <p><vlan_name> – The name of the VLAN on which the MAC address resides.</p> <p><macaddr> – The MAC address that will be shown.</p> <p>static – Displays the static MAC address entries.</p> <p>aging_time – Displays the aging time for the MAC address forwarding database.</p>
Restrictions	None.

Example Usage:

To display unicast MAC address table:

```
DGS-3224TGR:4#show fdb
Command: show fdb

Unicast MAC Address Aging Time = 300

VID  VLAN Name      MAC Address      Port  Type
---  -
1    default        00-00-00-00-01-02  5    Permanent
1    default        00-50-BA-6B-2A-29  9    Dynamic

Total Entries   : 2

DGS-3224TGR:4#
```

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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_portlist> all broadcast [enable disable] multicast [enable disable] dlf [enable disable]
show traffic control	port_list <storm_portlist>

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_portlist> all] broadcast [enable disable] multicast [enable disable] dlf [enable disable] threshold <value>
Description	This command is used to configure broadcast storm control.
Parameters	<p><i><storm_group list></i> – Used to specify a broadcast storm control group with the syntax: <i>module_id:group_id</i>.</p> <p><i>all</i> – Specifies all broadcast storm control groups on the switch.</p> <p><i>broadcast [enable disable]</i> – Enables or disables broadcast storm control.</p> <p><i>multicast [enable disable]</i> – Enables or disables multicast storm control.</p> <p><i>dlf [enable disable]</i> – Enables or disables dlf traffic control.</p> <p><i>threshold <value></i> – The upper threshold at which the specified traffic control is switched on. The <i><value></i> is the number of broadcast/multicast/dlf packets, in Kpps, 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 state:

```
DGS-3224TGR:4#config traffic control 2-3 broadcast enable
Command: config traffic control 2-3 broadcast enable

Success.

DGS-3224TGR:4#
```

show traffic control

Purpose	Used to display current traffic control settings.
Syntax	show traffic control <storm_portlist>
Description	This command displays the current storm traffic control configuration on the switch.
Parameters	<i>group_list</i> <storm_portlist> – Used to specify a broadcast storm control group with the syntax: port_number.
Restrictions	None.

Example Usage:
To display traffic control setting:

```
DGS-3224TGR:4#show traffic control
Command: show traffic control

Traffic Control

Port          Broadcast          Multicast          Destination Lookup Fail
State/Threshold (kpps) State/Threshold (kpps) State/Threshold (kpps)
-----
1 Disabled/128      Disabled/128      Disabled/128
2 Disabled/128      Disabled/128      Disabled/128
3 Disabled/128      Disabled/128      Disabled/128
4 Disabled/128      Disabled/128      Disabled/128
5 Disabled/128      Disabled/128      Disabled/128
6 Disabled/128      Disabled/128      Disabled/128
7 Disabled/128      Disabled/128      Disabled/128
8 Disabled/128      Disabled/128      Disabled/128
9 Disabled/128      Disabled/128      Disabled/128
10 Disabled/128     Disabled/128     Disabled/128
11 Disabled/128     Disabled/128     Disabled/128
12 Disabled/128     Disabled/128     Disabled/128
13 Disabled/128     Disabled/128     Disabled/128
14 Disabled/128     Disabled/128     Disabled/128
15 Disabled/128     Disabled/128     Disabled/128
16 Disabled/128     Disabled/128     Disabled/128
17 Disabled/128     Disabled/128     Disabled/128
```

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ARP COMMANDS

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

Command	Parameters
config arp_aging	time <min 0-65535>
show arprentry	{ipif(1) <ipif_name 12> ipaddress(2) <ipaddr> static(3)}
clear arptable	

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

config arp_aging

Purpose	Used to configure the age-out timer for ARP table entries on the switch.
Syntax	config arp_aging time <min 0-65535>
Description	This command sets the maximum amount of time, in minutes, that a ARP entry can remain in the switch's ARP table, without being accessed, before it is dropped from the table.
Parameters	<i>time <min 0-65535></i> – The ARP age-out time, in minutes. The default is 20.
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To configure ARP aging time:

```
DGS-3224TGR:4#config arp_aging time 30
Command: config arp_aging time 30

Success.

DGS-3224TGR:4#
```

show arpentry

Purpose	Used to display the ARP table.
Syntax	show arpentry {<i>ipif</i> <<i>ipif_name</i>> <i>ipaddress</i> <<i>network_address</i>> <i>static</i>}
Description	This command is used to display the current contents of the switch's ARP table.
Parameters	<p><<i>ipif_name</i>> – The name of the IP interface the end node or station for which the ARP table entry was made, resides on.</p> <p><<i>network_address</i>> – The network address corresponding to the IP interface name above.</p> <p><i>static</i> – Displays the static entries to the ARP table.</p>
Restrictions	None.

Example Usage:

To display the ARP table:

```
DGS-3224TGR:4#show arpentry
Command: show arpentry

ARP Aging Time : 20mins

Interface      IP Address      MAC Address      Type
-----
System         10.0.0.0         FF-FF-FF-FF-FF-FF Local/Broadcast
System         10.90.90.90      00-01-02-03-04-00 Local
System         10.255.255.255  FF-FF-FF-FF-FF-FF Local/Broadcast

Total Entries : 3

DGS-3224TGR: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 effected.
Parameters	None.
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To remove dynamic entries in the ARP table:

```
DGS-3224TGR:4#clear arptable
Command: clear arptable

Success.

DGS-3224TGR:4#
```

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QOS COMMANDS

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

Command	Parameters
config scheduling	<class_id 0-7> weight <value 1-15>
config scheduling_mechanism	[strict weight_fair]
show scheduling	
show scheduling_mechanism	
config 802.1p user_priority	<priority 0-7> <class_id 0-7>
show 802.1p user_priority	
config 802.1p default_priority	[<portlist> all] <priority 0-7>
show 802.1p default_priority	<portlist>
disable hol_prevention	
enable hol_prevention	
show hol_prevention	
config bandwidth_control	<portlist>{rx_rate [no_limit <value 1-1000>] tx_rate [no_limit <value 1-1000>]}
show bandwidth_control	{<portlist>}

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

config scheduling

Purpose	Used to configure the traffic scheduling mechanism for each COS queue.
Syntax	config scheduling <class_id 0-7> weight <value 1-15>
Description	<p>The switch contains eight 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 (if the config scheduling command is not used) is to empty the eight hardware priority queues in order – from the highest priority queue (hardware queue 8) to the lowest 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.</p>
Parameters	<class_id> – This specifies which of the eight hardware priority queues the config scheduling command will apply to. The eight hardware priority queues are identified by number – from 0 to 7 – with the 0 queue being the lowest priority.
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To configure scheduling:

```
DGS-3224TGR:4# config scheduling 7 weight 2
```

```
Command: config scheduling 7 weight 2
```

```
Success.
```

```
DGS-3224TGR:4#
```

show scheduling

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

Example Usage:

To show scheduling:

```
DGS-3224TGR:4# show scheduling
Command: show scheduling
```

QOS Output Scheduling

Class ID	MAX. Weight
Class-0	1
Class-1	2
Class-2	3
Class-3	4
Class-4	5
Class-5	6
Class-6	7
Class-7	8

```
DGS-3224TGR:4#
```

config scheduling_mechanism

Purpose	Used to configure the traffic scheduling mechanism for each COS queue.
Syntax	config scheduling_mechanism [strict weight_fair]
Description	This command is use to specify how the switch handle packets in priority queues.
Parameters	<p><i>strict</i> – The highest queue is the first to process traffic. That is, the highest queue should be finished at first.</p> <p><i>weight_fair</i> – Use the weight fair algorithm to handle packets in priority queues.</p>
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To configure the traffic scheduling mechanism for each COS queue:

```
DGS-3224TGR:4# config scheduling_mechanism strict
Command: config scheduling_mechanism strict
```

```
Success.
```

```
DGS-3224TGR: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:

```
DGS-3224TGR:4# show scheduling_mechanism
Command: show scheduling_mechanism

Scheduling Mechanism : weight_fair

DGS-3224TGR: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 0-7>																											
Description	<p>The config 802.1p user_priority command allows you to configure the way the switch will map an incoming packet, based on its 802.1p user priority, to one of the eight available hardware priority queues on the switch. The switch's default is to map the following incoming 802.1p user priority values to the eight hardware priority queues:</p> <p>The suggested mapping is included in the following table:</p> <table border="1"> <thead> <tr> <th>802.1p</th> <th>Hardware Queue</th> <th>Remark</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>2</td> <td>Mid-low</td> </tr> <tr> <td>1</td> <td>0</td> <td>Lowest</td> </tr> <tr> <td>2</td> <td>1</td> <td>Low</td> </tr> <tr> <td>3</td> <td>3</td> <td>Mid-low</td> </tr> <tr> <td>4</td> <td>4</td> <td>Mid-high</td> </tr> <tr> <td>5</td> <td>5</td> <td>Mid-high</td> </tr> <tr> <td>6</td> <td>6</td> <td>High</td> </tr> <tr> <td>7</td> <td>7</td> <td>Highest.</td> </tr> </tbody> </table> <p>This mapping scheme is based upon recommendations contained in IEEE 802.1D (page 40). You can change this mapping by specifying the 802.1p user priority you want to go to the <class_id> (the number of the hardware queue).</p> <p><priority> – The 802.1p user priority you want to associate with the <class_id> (the number of the hardware queue) with.</p> <p><class_id> – The number of the switch's hardware priority queue. The switch has eight hardware priority queues available. They are numbered between 0 (the lowest priority) and 7 (the highest priority).</p>	802.1p	Hardware Queue	Remark	0	2	Mid-low	1	0	Lowest	2	1	Low	3	3	Mid-low	4	4	Mid-high	5	5	Mid-high	6	6	High	7	7	Highest.
802.1p	Hardware Queue	Remark																										
0	2	Mid-low																										
1	0	Lowest																										
2	1	Low																										
3	3	Mid-low																										
4	4	Mid-high																										
5	5	Mid-high																										
6	6	High																										
7	7	Highest.																										
Restrictions	Only administrator-level users can issue this command.																											

Example Usage:

To configure 802.1p user priority:

```
DGS-3224TGR:4# config 802.1p user_priority 1 3
Command: config 802.1p user_priority 1 3

Success.

DGS-3224TGR:4#
```

show 802.1p user_priority

Purpose	Used to display the current 802.1p user priority to hardware priority queue mapping in use by the switch.
Syntax	show 802.1p user_priority
Description	This command will display the current 802.1p user priority to hardware priority queue mapping in use by the switch.
Parameters	None.
Restrictions	None.

Example Usage:

To show 802.1p user priority:

```
DGS-3224TGR:4# show 802.1p user_priority
Command: show 802.1p user_priority

QOS Class of Traffic

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

DGS-3224TGR:4#
```

config 802.1p default_priority

Purpose	Used to configure the 802.1p default priority settings on the switch. If an untagged packet is received by the switch, the priority configured with this command will be written to the packet's priority field.
Syntax	config 802.1p default_priority [<portlist> all] <priority 0-7>
Description	This command allows you to specify default priority handling of untagged packets received by the switch. The priority value entered with this command will be used to determine which of the eight hardware priority queues the packet is forwarded to.
Parameters	<p><i><portlist></i> – Specifies a range of ports that will belong to the link aggregation group. That is, a range of ports for which all untagged packets received will be assigned the priority specified below. 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. 1-4 specifies all of the ports between port 1 and port 4 – in numerical order.</p> <p><i>all</i> – Specifies that the command applies to all ports on the switch (or in the switch stack).</p> <p><i><priority 0-7></i> – The priority value you want to assign to untagged packets received by the switch or a range of ports on the switch.</p>
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To configure 802.1p default priority:

```
DGS-3224TGR:4#config 802.1p default_priority all 5
Command: config 802.1p default_priority all 5

Success.

DGS-3224TGR:4#
```

show 802.1p default_priority

Purpose	Used to display the current default priority settings on the switch.
Syntax	show 802.1p default_priority
Description	This command is used to display the current default priority settings on the switch.
Parameters	None.
Restrictions	None.

Example Usage:

To show 802.1p default priority:

```
DGS-3224TGR:4# show 802.1p default_priority
Command: show 802.1p default_priority
```

Port	Priority
-----	-----
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0

```
DGS-3224TGR: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:

```
DGS-3224TGR:4# enable hol_prevention
Command: enable hol_prevention

Success.

DGS-3224TGR: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:

```
DGS-3224TGR:4# disable hol_prevention
Command: disable hol_prevention

Success.

DGS-3224TGR: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:

```
DGS-3224TGR:4# show hol_prevention
Command: show hol_prevention

Success.

DGS-3224TGR: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 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><portlist> – This specifies a range of ports that will be mirrored. That is, a range of ports for which all traffic will be copied and sent to the Target port. The port list is specified by listing the beginning port number on that switch and the highest port number of the range. 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><i>rx</i> – Allows the mirroring of only packets received (flowing into) the port or ports in the port list.</p> <p><i>tx</i> – Allows the mirroring of only packets sent (flowing out of) the port or ports in the port list.</p> <p><i>both</i> – 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 add the mirroring ports:

```
DGS-3224TGR:4#config mirror port 10 add source ports 1-5 both
Command: config mirror port 10 add source ports 1-5 both
```

```
Success.
```

```
DGS-3224TGR:4#
```

config mirror delete

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

```
DGS-3224TGR:4#config mirror 5 delete source 1-5 both
Command: config mirror 5 delete source 1-5 both
```

```
Success.
```

```
DGS-3224TGR: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:

```
DGS-3224TGR:4#enable mirror
Command: enable mirror

Success.

DGS-3224TGR: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:

```
DGS-3224TGR:4#disable mirror
Command: disable mirror

Success.

DGS-3224TGR: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:

```
DGS-3224TGR:4#show mirror
Command: show mirror

Current Settings
Target Port: 9
Mirrored Port:
  RX:
  TX: 1-5

DGS-3224TGR:4#
```

PORT SECURITY COMMANDS

The 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 [enable disable]max_learning_addr<max_lock_no 0-10> lock_address_mode [permanent deleteontimeout deleteonreset]}
delete port_security_entry	vlan_name <vlan_name 32> mac_address <macaddr> port <port>
clear port_security_entry	port <portlist>
show port_security	{ports <portlist>}

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

config port_security

Purpose	Used to configure port security.
Syntax	ports [<portlist> all] {admin_state [enable disable]max_learning_addr<max_lock_no 0-10> lock_address_mode [permanent deleteontimeout deleteonreset]}
Description	This command allows you to configure port security, including admin state, maximum learning address, and lock address mode.
Parameters	<p><portlist> – Specifies a range of ports to be configured.</p> <p><i>all</i> – Instructs all ports to be configured.</p> <p><i>admin_state</i> – Allows the port security to be enabled or disabled for the ports specified in the port list.</p> <p><i>max_learning_addr</i> – The maximum number of addresses that can be learned.</p> <p><i>lock_address_mode</i> – Indicates the mode of locking address. Three choices are offered:</p> <p><i>Permanent</i> – Indicates the locked addresses will not age out, even when the system is rebooted. These locked addresses can be deleted when the system is reset.</p> <p><i>DeleteOnTimeout</i> – Indicates the locked addresses can be aged out after the aging timer expires.</p> <p><i>DeleteOnReset</i> – Indicates never age out the locked addresses unless the system is rebooted or reset in order to prevent port movement or intrusion.</p>

config port_security

Restrictions Only administrator-level users can issue this command.

Example Usage:

To config port security:

```
DGS-3224TGR:4#config port_security ports 1-6 admin_state enable
max_learning_addr 10 lock_address_mode Permanent
Command: config port_security ports 1-6 admin_state enable
max_learning_addr 10 lock_address_mode Permanent
```

Success.

```
DGS-3224TGR:4#
```

delete port_security_entry

Purpose	Used to delete a port security entry by MAC address, port number, and VLAN ID.
Syntax	delete port_security_entry <i>vlan_name</i> < <i>vlan_name</i> 32> <i>mac_address</i> < <i>macaddr</i> > port < <i>port</i> >
Description	This command is used to delete a port security entry by MAC address, port number, and VLAN ID.
Parameters	<p><<i>vlan_name</i>> – The vlan name the port belongs to.</p> <p><i>mac_address</i> – The MAC address to be deleted which was learned by the port.</p> <p><i>port</i> – The port number which has learned the MAC address.</p>
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To delete a default route from the routing table:

```
DGS-3224TGR:4#delete port_security_entry vlan_name default
mac_address 00-01-30-10-2C-C7 port 6
Command: delete port_security_entry vlan_name default mac_address 00-
01-30-10-2C-C7 port 6
```

Success.

```
DGS-3224TGR:4#
```

clear port_security_entry

Purpose	Used to clear the MAC entries learned from the specified port(s) for the port security function.
Syntax	clear port_security_entry port < <i>portlist</i> >
Description	Used to clear the MAC entries learned from the specified port(s) for the port security function.
Parameters	< <i>portlist</i> > – A range of ports to be configured.
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To clear port security entry by port(s):

```
DGS-3224TGR:4#clear port_security_entry port 1-6
Command: clear port_security_entry port 1-6

Success.

DGS-3224TGR:4#
```

show port_security

Purpose	Used to display the port security related information of the switch ports.
Syntax	show port_security {ports<portlist>}
Description	The show port_security command displays the port security related information of the switch ports, including port security admin state, maximum number of learning addresses, and lock mode.
Parameters	<portlist> – A range of ports you want to show. The port list is specified by listing the beginning port number and the highest port number of the range. 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.
Restrictions	None.

Example Usage:

To display the port security information of switch ports:

```
DGS-3224TGR:4#show port_security ports 1-3
Command: show port_security ports 1-3

Port  Admin State  Max. Learning Addr.  Lock Address Mode
-----
1      Disabled      1                    DeleteOnReset
2      Disabled      1                    DeleteOnReset
3      Disabled      1                    DeleteOnReset

DGS-3224TGR:4#
```

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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 1-4094> advertisement
delete vlan	<vlan_name 32>
config vlan	<vlan_name 32> add [tagged untagged forbidden] <portlist>
config vlan	<vlan_name 32> delete <portlist>
config vlan	<vlan_name 32> advertisement [enable disable]
config gvrp	<portlist> all {state [enable disable] ingress_checking [enable disable] pvid <vlanid 1-4094>}
enable gvrp	
disable gvrp	
show vlan	<vlan_name 32>
show gvrp	<portlist>
enable asymmetric_vlan	
disable asymmetric_vlan	
show asymmetric_vlan	

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 1-4094> 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 1-4094> – The VLAN ID of the VLAN to be created.</p> <p><i>advertisement</i> – Specifies the VLAN participates normally in GARP/GVRP protocol exchanges. If this parameter is not set, the switch cannot send any GARP/GVRP messages about the VLAN.</p>
Restrictions	Each VLAN name can be up to 32 characters. If the VLAN is not given a tag, it will automatically allocate a VID value. Only administrator-level users can issue this command.

Example Usage:

To create a VLAN v1, tag 2:

```
DGS-3224TGR:4#create vlan v1 tag 2
Command: create vlan v1 tag 2

Success.
DGS-3224TGR: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 a vlan v1:

```
DGS-3224TGR:4#delete vlan v1
Command: delete vlan v1

Success.
DGS-3224TGR:4#
```

config vlan add ports

Purpose	Used to add additional ports to a previously configured VLAN.
Syntax	config vlan <vlan_name 32> add [tagged untagged forbidden] <portlist>
Description	This command allows you to add ports to the port list of a previously configured VLAN. You can specify the additional ports as tagging, untagging, or forbidden.
Parameters	<p><vlan_name 32> – The name of the VLAN you want to add ports to.</p> <p><i>tagged</i> – Specifies the additional ports as tagged.</p> <p><i>untagged</i> – Specifies the additional ports as untagged.</p> <p><i>forbidden</i> – Specifies the additional ports as forbidden.</p> <p><portlist> – A range of ports to add to the VLAN. The port list is specified by listing the beginning port number and the highest port number of the range. 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>
Restrictions	Only administrator-level users can issue this command.

Example Usage:

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

```
DGS-3224TGR:4#config vlan v1 add tagged 4-8
```

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

```
Success.
```

```
DGS-3224TGR:4#
```

config vlan delete ports

Purpose	Used to delete one or more ports from a previously configured VLAN
Syntax	config vlan <vlan_name 32> delete <portlist>
Description	This command allows you to delete ports from a previously configured VLAN's port list.
Parameters	<p><vlan_name 32> – The name of the VLAN you want to delete ports from.</p> <p><portlist> – A range of ports you want to delete from the above specified VLAN. The port list is specified by listing the beginning port number and the highest port number of the range. 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>
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To delete 4 through 8 to the VLAN v1:

```
DGS-3224TGR:4#config vlan v1 delete 4-8
```

```
Command: config vlan v1 delete 4-8
```

```
Success.
```

```
DGS-3224TGR:4#
```

config vlan advertisement

Purpose	Used to enable or disable the VLAN advertisement.
Syntax	config vlan <vlan_name 32> advertisement [enable disable]
Description	This command is used to enable or disable sending GVRP messages on the specified VLAN.
Parameters	<p><vlan_name 32> – The name of the VLAN on which you want to enable or disable sending GVRP messages.</p> <p><i>enable</i> – Enables sending GVRP messages on the specified VLAN.</p> <p><i>disable</i> – Disables sending GVRP messages on the specified VLAN.</p>
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To enable the VLAN default advertisement:

```
DGS-3224TGR:4#config vlan default advertisement enable
```

```
Command: config vlan default advertisement enable
```

```
Success.
```

```
DGS-3224TGR:4#
```

config gvrp

Purpose	Used to configure GVRP on the switch.
Syntax	config gvrp [<portlist> all] {state [enable disable]} [ingress_checking [enable disable]] [pvid <vlanid 1-4094>}
Description	This command is used to configure the Group VLAN Registration Protocol on the switch. You can configure ingress checking and the GVRP status for each port. If the asymmetric VLAN is enabled, you can configure PVID. If it is disabled, you can not configure PVID.
Parameters	<p><portlist> – A range of ports for which you want ingress checking. The port list is specified by listing the beginning port number and the highest port number of the range. 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><i>all</i> – Specifies all of the ports on the switch.</p> <p><i>state [enable disable]</i> – Enables or disables GVRP for the ports specified in the port list.</p> <p><i>ingress_checking [enable disable]</i> – Enables or disables ingress checking for the specified port list.</p> <p><i>pvid</i> – Specifies the default VLAN will associate with the port.</p>

config gvrp

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

Example Usage:

To sets the ingress checking status and the GVRP status:

```
DGS-3224TGR:4#config gvrp 1-5 state enable ingress_checking enable
pvid 2
Command: config gvrp 1-5 state enable ingress_checking enable pvid 2

Success.

DGS-3224TGR: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 for each port on the switch.
Parameters	None.
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To enable the generic VLAN Registration Protocol (GVRP):

```
DGS-3224TGR:4#enable gvrp
Command: enable gvrp

Success.

DGS-3224TGR:4#
```

disable gvrp

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

Example Usage:

To disable the Generic VLAN Registration Protocol (GVRP):

```
DGS-3224TGR:4#disable gvrp
Command: disable gvrp
```

```
Success.
```

```
DGS-3224TGR: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 VLAN settings:

```
DGS-3224TGR:4#show vlan
Command: show vlan

VID          : 1          VLAN Name    : default
VLAN TYPE    : static    Advertisement : Enabled
Member ports : 1-24
  Static ports : 1-24
Untagged ports : 1-23
Forbidden ports :

Total Entries : 1

DGS-3224TGR: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 PVID/GVRP state/ingress checking state of each port 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 beginning port number and the highest port number of the range. 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 port 3 and port 4 – in numerical order.
Restrictions	None.

Example Usage:

To display 802.1Q port setting:

```
DGS-3224TGR:4#show gvrp
Command: show gvrp

Global GVRP : Disabled

Port  PVID  GVRP      Ingress Checking
----  -
1     1     Enable    Enable
2     1     Enable    Enable
3     1     Enable    Enable
4     1     Enable    Enable
5     1     Enable    Enable
6     1     Disable   Disable
7     1     Disable   Disable
8     1     Disable   Disable
9     1     Disable   Disable
10    1     Disable   Disable
11    1     Disable   Disable
12    1     Disable   Disable
13    1     Disable   Disable
14    1     Disable   Disable
15    1     Disable   Disable
16    1     Disable   Disable
17    1     Disable   Disable
18    1     Disable   Disable
19    1     Disable   Disable
20    1     Disable   Disable
21    1     Disable   Disable
22    1     Disable   Disable
23    1     Disable   Disable
24    1     Disable   Disable

Total Entries : 24

DGS-3224TGR:4#
```

enable asymmetric_vlan

Purpose	Used to enable asymmetric VLANs on the switch.
Syntax	enable asymmetric_vlan
Description	This command enables asymmetric VLANs.
Parameters	None.
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To enable asymmetric VLANs:

```
DGS-3224TGR:4#enable asymmetric_vlan
Command: enable asymmetric_vlan
```

```
Success.
```

```
DGS-3224TGR:4#
```

disable asymmetric_vlan

Purpose	Used to disable asymmetric VLANs on the switch.
Syntax	disable asymmetric_vlan
Description	This command disables asymmetric VLANs.
Parameters	None.
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To disable asymmetric VLANs:

```
DGS-3224TGR:4#disable asymmetric_vlan
Command: disable asymmetric_vlan
```

```
Success.
```

```
DGS-3224TGR:4#
```

show asymmetric_vlan

Purpose	Used to display the current asymmetric VLAN status on the switch.
Syntax	show asymmetric_vlan
Description	This command displays asymmetric VLAN status.
Parameters	None.
Restrictions	None.

Example Usage:

To display asymmetric VLAN status:

```
DGS-3224TGR:4#show asymmetric_vlan
Command: show asymmetric_vlan
```

```
Asymmetric Vlan          : Enabled
```

```
DGS-3224TGR: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 <value 1-32>
config link_aggregation	group_id <value 1-32> {master_port <port> ports <portlist> state [enable disable]}
config link_aggregation algorithm	[mac_source mac_destination mac_source_dest ip_source ip_destination ip_source_dest
show link_aggregation	group_id <value 1-32> 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 group_id

Purpose	Used to create a link aggregation group on the switch.
Syntax	create link_aggregation group_id <value 1-32>(type [lacp static])
Description	This command will create a link aggregation group.
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><i>type [lacp static]</i> – Indicates the group type belongs to <i>static</i> or <i>lacp</i>. If type is not specified, the default is <i>static</i>.</p>
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To create link aggregation group:

```
DGS-3224TGR:4#create link_aggregation group_id 1
Command: create link_aggregation group_id 1

Success.

DGS-3224TGR: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:

```
DGS-3224TGR:4#delete link_aggregation group_id 6
Command: delete link_aggregation group_id 6

Success.

DGS-3224TGR:4#
```

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 [enable disable]}
Description	This command allows you to configure a link aggregation group that was created with the create link_aggregation command above.
Parameters	<p><i><value 1-32></i> – 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><i><port></i> – 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><i><portlist></i> – Specifies a range of ports that will belong to the link aggregation group. 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. 1-4 specifies all of the ports between port 1 and port 4 – in numerical order.</p> <p><i>state [enable disable]</i> – Allows you to enable or disable the specified link aggregation group.</p>
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To define a load-sharing group of ports, group-id 1, master port 10:

```
DGS-3224TGR:4#config link_aggregation group_id 1 master_port
10 ports 5-10
Command: config link_aggregation group_id 1 master_port 10
ports 5-10

Success.

DGS-3224TGR: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><i>mac_source</i> – Indicates that the switch should examine the MAC source address.</p> <p><i>mac_destination</i> – Indicates that the switch should examine the MAC destination address.</p> <p><i>mac_source_dest</i> – Indicates that the switch should examine the MAC source and destination addresses.</p> <p><i>ip_source</i> – Indicates that the switch should examine the IP source address.</p> <p><i>ip_destination</i> – Indicates that the switch should examine the IP destination address.</p> <p><i>ip_source_dest</i> – 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:

```
DGS-3224TGR:4#config link_aggregation algorithm mac_source_dest
Command: config link_aggregation algorithm mac_source_dest

Success.

DGS-3224TGR: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.
Parameters	<p><i><value 1-32></i> – Specifies the group id. The switch allows up to six link aggregation groups to be configured. The group number identifies each of the groups.</p> <p><i>algorithm</i> – Allows you to specify the display of link aggregation by the algorithm in use by that group.</p>
Restrictions	None.

Example Usage:

To show link aggregation:

```

DGS-3224TGR:4#show link_aggregation
Command: show link_aggregation

Link Aggregation Algorithm = MAC-source
Group ID      : 1
Type          : TRUNK
Master Port   : 10
Member Port   : 5-10
Active Port   :
Status        : Disabled
Flooding Port : 0

DGS-3224TGR:4#

```

config lacp_ports

Purpose	Used to configure the current mode of LACP for specified ports.
Syntax	config lacp_ports <portlist> mode [active passive]
Description	This command configures per-port LACP mode.
Parameters	<p><i><portlist></i> – Specifies a range of ports to be configured. 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. 1-4 specifies all of the ports between port 1 and port 4 – in numerical order.</p> <p><i>mode [active passive]</i> – If neither <i>active</i> or <i>passive</i> is specified, the system will display the current LACP status for all ports.</p>
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To configure ports for LACP:

```

DGS-3224TGR:4#config lacp_port 1-12 mode active
Command: config lacp_port 1-12 mode active

Success.

DGS-3224TGR:4#

```

show lacp_ports

Purpose	Used to display the current mode of LACP ports.
Syntax	show lacp_ports <portlist>
Description	This command will display per-port LACP mode.
Parameters	<p><i><portlist></i> – Specifies a range of ports to be configured. If no parameter is specified, the system will display the current LACP status of all ports. 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. 1-4 specifies all of the ports between port 1 and port 4 – in numerical order.</p>
Restrictions	None.

Example Usage:

To show the LACP status for ports 1 to 3:

```
DGS-3224TGR:4#show lacp_ports
Command: show lacp_ports 1-3

Port    Activity
-----  -
1       Active
2       Active
3       Active

DGS-3224TGR:4#
```

IP INTERFACE COMMANDS

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

Command	Parameters
config ipif System	vlan <vlan_name> ipaddress <network_address> state [enable disable] bootp dhcp
show ipif	<ipif_name>

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

config ipif System

Purpose	Used to configure the System IP interface.
Syntax	config ipif System [{vlan <vlan_name> ipaddress <network_address> state [enable disable]]bootp dhcp}]
Description	This command is used to configure the System IP interface on the switch.
Parameters	<p><vlan_name> – The name of the VLAN corresponding to the System IP interface.</p> <p><network_address> – IP address and netmask of th 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, 10.1.2.3/16).</p> <p><i>state [enable disable]</i> – Allows you to enable or disable the IP interface.</p> <p><i>bootp</i> – Allows the selection of the BOOTP protocol for the assignment of an IP address to the switch's System IP interface.</p> <p><i>dhcp</i> – Allows the selection of the DHCP protocol for the assignment of an IP address to the switch's System IP interface.</p>
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To configure the IP interface System:

```
DGS-3224TGR:4#config ipif System ipaddress 10.48.74.122/8
Command: config ipif System ipaddress 10.48.74.122/8

Success.

DGS-3224TGR: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 of the IP interface you want to show.
Restrictions	None.

Example Usage:

To display IP interface settings:

```
DGS-3224TGR: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  : Enabled
Link Status   : Link UP
Member Ports  : 1-24

Total Entries : 1

DGS-3224TGR:4#
```

IGMP SNOOPING 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 igmp_snooping	<vlan_name 32> all host_timeout <sec 1-16711450> router_timeout <sec 1-16711450> leave_timer <sec 1-16711450> state [enable disable] fast_leave [enable disable]
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 1-65535> state [enable disable]
config router_ports	<vlan_name 32> [add delete] <portlist>
enable igmp snooping	forward_mcrouter_only
show igmp_snooping	vlan <vlan_name 32>
show router ports	vlan <vlan_name 32> static dynamic
show igmp_snooping group	{vlan <vlan_name 32>}
config router_ports	<vlan_name 32> [add delete] <portlist>
disable igmp_snooping	

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 1-16711450> router_timeout <sec 1-16711450> leave_timer <sec 1-16711450> state [enable disable]} fast_leave [enable disable]
Description	This command allows you to configure IGMP snooping on the switch.
Parameters	<p><i><vlan_name 32></i> – The name of the VLAN for which IGMP snooping is to be configured.</p> <p><i>host_timeout <sec 1-16711450></i> – 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.</p> <p><i>router_timeout <sec 1-16711450></i> – Specifies the maximum amount of time a route will remain in the switch's can be a member of a multicast group without the switch receiving a host membership report. The default is 260 seconds.</p> <p><i>leave_timer <sec 1-16711450></i> – Leave timer. The default is 2 seconds.</p> <p><i>state [enable disable]</i> – Allows you to enable or disable IGMP snooping for the specified VLAN.</p> <p><i>fast_leave [enable disable]</i> – This enables or disables the IGMP snooping fast_leave function. If enabled, the membership is immediately removed when the system receives the IGMP leave message.</p>
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To configure the IGMP snooping:

```
DGS-3224TGR:4#config igmp_snooping default host_timeout 250 state
enabled fast_leave enable
Command: config igmp_snooping default host_timeout 250 state enabled
fast_leave enable

Success.

DGS-3224TGR:4#
```

config igmp_snooping querier

Purpose	Used to configure the time in seconds between general query transmissions, the maximum time in seconds to wait for reports from members, the permitted packet loss that guarantees IGMP snooping.
Syntax	config igmp_snooping querier [<i><vlan_name 32></i> all] {<i>query_interval <sec 1-65535></i> <i>max_response_time <sec 1-25></i> <i>robustness_variable <value 1-255></i> <i>last_member_query_interval <sec 1-65535></i> <i>state [enable disable]</i>}
Description	This command configures IGMP snooping querier.
Parameters	<p><i><vlan_name 32></i> – The name of the VLAN for which IGMP snooping querier is to be configured.</p> <p><i>query_interval <sec 1-65535></i> – Specifies the amount of time in seconds between general query transmissions. The default setting is 125 seconds.</p> <p><i>max_response_time <sec 1-25></i> – Specifies the maximum time in seconds to wait for reports from members. The default setting is 10 seconds.</p> <p><i>robustness_variable <value 1-255></i> – 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:</p> <ul style="list-style-type: none"> • 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. <p><i>last_member_query_interval <sec 1-65535></i> – 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.</p> <p><i>state [enable disable]</i> – Allows the switch to be specified as an IGMP Querier or Non-querier.</p>
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To configure IGMP snooping:

```
DGS-3224TGR:4#config igmp_snooping querier default query_interval 125 state
enable
```

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

```
Success.
```

```
DGS-3224TGR: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 which will be configured as router ports. The port list is specified by listing the beginning port number and the highest port number of the range. 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>
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To set up static router ports:

```
DGS-3224TGR:4#config router_ports default add1-10
```

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

```
Success.
```

```
DGS-3224TGR: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 <code>forward_mcrouter_only</code> is specified, the switch will forward all multicast traffic to the multicast router, only. Otherwise, the switch forwards all mulitcast traffic to any IP router.
Parameters	<i>forward_mcrouter_only</i> – Specifies that the switch should forward all multicast traffic to a multicast-enabled router only. 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:

```
DGS-3224TGR:4#enable igmp_snooping
Command: enable igmp_snooping

Success.

DGS-3224TGR:4#
```

disable igmp_snooping

Purpose	Used to disable IGMP snooping on the switch.
Syntax	disable igmp_snooping
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	None.
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To disable IGMP snooping on the switch:

```
DGS-3224TGR:4#disable igmp_snooping
Command: disable igmp_snooping

Success.

DGS-3224TGR: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.
Restrictions	None.

Example Usage:

To show IGMP snooping:

```
DGS-3224TGR: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
Multicast fast leave       : Disabled

Total Entries   : 1

DGS-3224TGR: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:

```
DGS-3224TGR: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  : 7

VLAN Name   : default
Multicast group: 224.0.0.9
MAC address  : 01-00-5E-00-00-09
Reports     : 1
Port Member  : 7

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

Total Entries : 3

DGS-3224TGR: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}
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. <i>static</i> – Displays router ports that have been statically configured. <i>dynamic</i> – Displays router ports that have been dynamically configured.
Restrictions	None.

Example Usage:

To display the router ports:

```
DGS-3224TGR:4#show router_ports
Command: show router_ports

VLAN Name      : default
Static router port : 1-10
Dynamic router port :

Total Entries   : 1

DGS-3224TGR: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>
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 an IP route entry to the switch's IP routing table.
Syntax	create iproute [default]<network_address> <ipaddr> {<metric>}
Description	This command is used to create an IP route entry to the switch's IP routing table.
Parameters	<p><i>default</i> – 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, 10.1.2.3/16).</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 static address 10.48.74.121, mask 255.0.0.0, and gateway 10.1.1.254 to the routing table:

```
DGS-3224TGR: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.

DGS-3224TGR: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	<p><i>default</i> – Deletes a default IP route entry.</p> <p><<i>network_address</i>> – 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, 10.1.2.3/16).</p>
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:

```
DGS-3224TGR:4#delete iproute 10.48.74.121/255.0.0.0
Command: delete iproute 10.48.74.121/8

Success.

DGS-3224TGR: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><<i>network_address</i>> – 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, 10.1.2.3/16).</p>
Restrictions	none.

Example Usage:

To display the contents of the IP routing table:

```
DGS-3224TGR:4#show iproute
Command: show iproute

IP Address /Netmask   Gateway      Interface    Hops         Protocol
-----
10.0.0.0/9           0.0.0.0     System       1            Local

Total Entries   : 1

DGS-3224TGR:4#
```

802.1X COMMANDS

The DGS-3224TGR implements the server-side of the IEEE 802.1x Port-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	
config 802.1x auth_protocol	[local radius_eap]
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 [enabled disabled]
config 802.1x init	[port_based [<portlist> all] mac_based [<portlist> all] {mac_address <macaddr>}]
config 802.1x reauth	[port_based [<portlist> all] mac_based [<portlist> all] {mac_address <macaddr>}]
config radius add	<server_index 1-3> {ipaddress <server_ip> key <passwd 32> 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> key <passwd 32> auth_port <udp_port_number 1-65535> acct_port <udp_port_number 1-65535>
show radius	
show 802.1x user	
create 802.1x user	<username 15>
delete 802.1x user	<username 15>
show auth_statistics	{ports <portlist>}
show auth_diagnostics	{ports <portlist>}

Command	Parameters
show auth_session_statistics	{ports <portlist>}
show radius auth_client	
show radius acct_client	
config 802.1x auth_mode	[port_based mac_based]

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:

```
DGS-3224TGR:4#enable 802.1x
Command: enable 802.1x

Success.

DGS-3224TGR: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:

```
DGS-3224TGR:4#disable 802.1x
Command: disable 802.1x

Success.

DGS-3224TGR: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	<i>local radius_EAP</i> – Specify the type of authentication protocol desired.
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To configure 802.1x authentication protocol:

```
DGS-3224TGR:4# config 802.1x auth_protocol radius_eap
Command: config 802.1x auth_protocol radius_eap

Success.

DGS-3224TGR:4#
```

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 two capabilities that can be set for each port: Authenticator and None.
Parameters	<p><i><portlist></i> – Specifies a range of ports. The port list is specified by listing the beginning port number and the highest port number of the range. 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><i>all</i> – Specifies all of the ports on the switch.</p> <p><i>authenticator</i> – A user must pass the authentication process to gain access to the network.</p> <p><i>none</i> – The port is not controlled by the 802.1x functions.</p>
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To configure 802.1x capability on ports 1-10:

```
DGS-3224TGR:4#config 802.1x capability ports 1 – 10 authenticator
Command: config 802.1x capability ports 1-10 authenticator

Success.

DGS-3224TGR: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> max_req <value 1-10> reauth_period <sec 1-65535> enable_reauth [enabled disabled]]]
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><i><portlist></i> – Specifies a range of ports. The port list is specified by listing the beginning port number and the highest port number of the range. 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><i>all</i> – Specifies all of the ports on the switch.</p> <p><i>default</i> – Returns all of the ports in the specified range to their 802.1x default settings.</p> <p><i>direction [both in]</i> – Determines whether a controlled port blocks communication in both the receiving and transmitting directions, or just the receiving direction.</p> <p><i>port_control</i> – Configures the administrative control over the authentication process for the range of ports.</p> <p><i>force_auth</i> – Forces the Authenticator for the port to become authorized. Network access is allowed.</p> <p><i>auto</i> – Allows the port's status to reflect the outcome of the authentication process.</p> <p><i>force_unauth</i> – Forces the Authenticator for the port to become unauthorized. Network access will be blocked.</p> <p><i>quiet_period <sec 0-65535></i> – Configures the time interval between authentication failure and the start of a new authentication attempt.</p> <p><i>max_req <value 1-10></i> – Configures the number of times to retry sending packets to a supplicant (user).</p> <p><i>reauth_period <sec 1-65535></i> – Configures the time interval between successive re-authentications.</p> <p><i>enable_reauth [enabled disabled]</i> – 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.</p>
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To configure 802.1x authentication parameters for ports 1 to 20:

```
DGS-3224TGR:4#config 802.1x auth_parameter ports 1 – 20 direction both
Command: config 802.1x auth_parameter ports 1-20 direction both
```

```
Success.
```

```
DGS-3224TGR:4#
```

config 802.1x init

Purpose	Used to initialize the 802.1x functions on a range of ports.
Syntax	config 802.1x init [port_based [<portlist> all] mac_based[<portlist> all] {mac_address <macaddr>}]
Description	The config 802.1x init command is used to immediately initialize the 802.1x functions on a range of ports.
Parameters	<p><i>port_based</i> – Configure the authentication as port-based mode.</p> <p><i>mac_based</i> – Configure the authentication as MAC-based mode.</p> <p><i><portlist></i> – Specifies a range of ports. The port list is specified by listing the beginning port number and the highest port number of the range. 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><i>all</i> – Specifies all of the ports on the switch.</p> <p><i>mac_address</i> – MAC address of client.</p>
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To initialize 802.1x port-based functions on ports 15 to 18:

```
DGS-3224TGR:4#config 802.1x init port-based 15-18
Command: config 802.1x init port-based 15-18

Success.

DGS-3224TGR:4#
```

config 802.1x reauth

Purpose	Used to configure the 802.1x re-authentication feature of the switch.
Syntax	config 802.1x reauth [port_based [<portlist> all] mac_based[<portlist> all] {mac_address <macaddr>}]
Description	The config 802.1x reauth command is used to enable the 802.1x re-authentication feature on the switch.
Parameters	<p><i>port_based</i> – Switch pass data based on its authenticated port.</p> <p><i>mac_based</i> – Switch pass data based on MAC address of authenticated RADIUS client.</p> <p><i><portlist></i> – Specifies a range of ports. The port list is specified by listing the beginning port number and the highest port number of the range. 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><i>all</i> – Specifies all of the ports on the switch.</p> <p><i>mac_address</i> – MAC address of authenticated RADIUS client.</p>
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To configure 802.1x reauthentication for ports 15-18:

```
DGS-3224TGR:4#config 802.1x reauth port_based 15-18
Command: config 802.1x reauth port_based 15-18

Success.

DGS-3224TGR:4#
```

config radius add

Purpose	Used to configure the settings the switch will use to communicate with a RADIUS server.
Syntax	config radius <server_index 1-3> {ipaddress <server_ip> key <passwd 32> 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><i><server_index 1-3></i> – Assigns a number to the current set of RADIUS server settings. Up to three groups of RADIUS server settings can be entered on the switch.</p> <p><i>ipaddress <server_ip></i> – The IP address of the RADIUS server.</p> <p><i>key</i> – Specifies that a password and encryption key will be used between the switch and the RADIUS server.</p> <p><i><passwd 32></i> – The shared-secret key used by the RADIUS server and the switch. Up to 32 characters can be used.</p> <p><i>auth_port <udp_port_number 1-65535></i> – The UDP port number for authentication requests. The default is 1812.</p> <p><i>acct_port <udp_port_number 1-65535></i> – 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 RADIUS server communication settings:

```
DGS-3224TGR: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.

DGS-3224TGR: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 three 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:

```
DGS-3224TGR:4#config radius delete 1
Command: config radius delete 1

Success.

DGS-3224TGR: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	<p><server_index 1-3> – Assigns a number to the current set of RADIUS server settings. Up to three 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 – Returns all of the ports in the range to their default RADIUS 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 RADIUS settings:

```
DGS-3224TGR: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.
```

```
DGS-3224TGR: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 the switch:

```
DGS-3224TGR: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	dgs324
3	30.1.1.1	1812	1813	Active	dlink

```
Total Entries : 3
DGS-3224TGR:4#
```

show 802.1x user

Purpose	Used to display the current configuration of the 802.1x server on the switch.
Syntax	show 802.1x user
Description	The show 802.1x user command is used to display the current configuration of 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 show the 802.1x user:

```
DGS-3224TGR:4#show 802.1x user
Command: show 802.1x user
```

```
Index  UserName
-----  -
1      ctsnow
```

```
DGS-3224TGR: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:

```
DGS-3224TGR:4#create 802.1x user ctsnow
Command: create 802.1x user ctsnow

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

DGS-3224TGR:4#
```

delete 802.1x user

Purpose	Used to delete the switch's 802.1x users.
Syntax	delete 802.1x user <username 15>
Description	The delete 802.1x user command is used to delete 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 delete 802.1x users:

```
DGS-3224TGR:4# delete 802.1x user
Command: delete 802.1x user ctsnow

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

DGS-3224TGR:4#
```

show auth_statistics

Purpose	Used to display the switch's authentication statistics.
Syntax	show auth_statistics {ports <portlist>}
Description	The show auth_statistics command is used to display authentication statistics.
Parameters	<i>ports <portlist></i> – Specifies a range of ports. The port list is specified by listing the beginning port number and the highest port number of the range. 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.
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To display authentication statistics:

```
DGS-3224TGR:4#show auth_statistics
Command: show auth_statistics

Port number : 1

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 p Previous Page r Refresh
```

show auth_diagnostics

Purpose	Used to display the switch's authentication diagnostics statistics.
Syntax	show auth_diagnostics {ports <portlist>}
Description	The show auth_diagnostics command is used to display authentication diagnostics statistics.
Parameters	<i>ports <portlist></i> – Specifies a range of ports. The port list is specified by listing the beginning port number and the highest port number of the range. 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.
Restrictions	None.

Example Usage:

To display authentication diagnostics statistics:

```

DGS-3224TGR:4# show auth_diagnostics
Command: show auth_diagnostics

Port number   : 1

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

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```

show auth_session_statistics

Purpose	Used to display the authentication session statistics.
Syntax	show auth_session_statistics {ports <portlist>}
Description	The show auth_session_statistics command is used to display the switch's authentication session statistics.
Parameters	<i>ports <portlist></i> – Specifies a range of ports. The port list is specified by listing the beginning port number and the highest port number of the range. 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.
Restrictions	None.

Example Usage:

To display authentication session statistics:

```

DGS-3224TGR:4# show auth_session_statistics
Command: show auth_session_statistics

Port number : 1

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 |p Previous Page | Refresh

```

show radius auth_client

Purpose	Used to display the switch's RADIUS authentication client statistics.
Syntax	show radius auth_client
Description	The show radius auth_client command is used to display RADIUS authentication client statistics.
Parameters	None.
Restrictions	None.

Example Usage:

To display RADIUS authentication client statistics:

```

DGS-3224TGR:4# show radius auth_client
Command: show radius auth_client

radiusAuthClient ==>
radiusAuthClientInvalidServerAddresses      0
radiusAuthClientIdentifier                  D-Link

radiusAuthServerEntry ==>
radiusAuthServerIndex :1

radiusAuthServerAddress                      0.0.0.0
radiusAuthClientServerPortNumber           0
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 | p Previous Page | r Refresh

```

show radius acct_client

Purpose	Used to configure the switch's RADIUS account client statistics.
Syntax	show radius acct_client
Description	The show radius acct_client command is used to display the switch's RADIUS account client statistics.
Parameters	None.
Restrictions	None.

Example Usage:

To display the RADIUS account client statistics:

```

DGS-3224TGR:4# show radius acct_client
Command: show radius acct_client

radiusAcctClient ==>
radiusAcctClientInvalidServerAddresses 0
radiusAcctClientIdentifier              D-Link

radiusAuthServerEntry ==>
radiusAccServerIndex : 1

radiusAccServerAddress                  0.0.0.0
radiusAccClientServerPortNumber        0
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 | p Previous Page | Refresh

```

config 802.1x auth_mode

Purpose	Used to configure 802.1x authentication mode.
Syntax	config 802.1x auth_mode [port_based mac_based]
Description	The config 802.1x auth_mode command configures the authentication mode.
Parameters	<i>port_based</i> – Configure the authentication as port-based mode. <i>mac_based</i> – Configure the authentication as MAC-based mode.
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To configure the authentication mode:

```

DGS-3224TGR:4# config 802.1x auth_mode mac_based
Command: config 802.1x auth_mode mac_based

Success.

DGS-3224TGR:4#

```

ACCESS CONTROL LIST (ACL) COMMANDS

The DGS-3224TGR 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_mask <hex 0x0 - 0xFF> user_define_mask <hex 0x0-0xffffffff><hex 0x0-0xffffffff><hex 0x0- 0xffffffff><hex 0x0-0xffffffff><hex 0x0-0xffffffff> packet_content_mask {offset_0-15 <hex 0x0-0xffffffff><hex 0x0-0xffffffff><hex 0x0-0xffffffff><hex 0x0-0xffffffff> offset_16-31<hex 0x0-0xffffffff><hex 0x0- 0xffffffff><hex 0x0-0xffffffff><hex 0x0-0xffffffff> offset_32-47 <hex 0x0- 0xffffffff><hex 0x0-0xffffffff><hex 0x0-0xffffffff><hex 0x0-0xffffffff> offset_48-63 <hex 0x0-0xffffffff><hex 0x0-0xffffffff><hex 0x0-0xffffffff><hex 0x0- 0xffffffff>offset_64-79 <hex 0x0-0xffffffff><hex 0x0-0xffffffff><hex 0x0- 0xffffffff><hex 0x0-0xffffffff>} port[<portlist> all] profile_id <value 1-8>
delete access_profile	profile_id <value 1-8>
config access_profile	profile_id <value 1-8>

Command	Parameters
	<pre> add access_id <value 1-255> ethernet vlan <vlan_name 32> source_mac <macaddr> destination_mac <macaddr> 802.1p <value 0-7> ethernet_type <hex 0x0-0xff> 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> flag_mask all urg ack psh rst syn fin udp src_port <value 0-65535> dst_port <value 0-65535> protocol_id <value 0-255> </pre>

Command	Parameters
---------	------------

Command	Parameters
	<p>user_define <hex 0x0-0xffffffff> <hex 0x0-0xffffffff><hex 0x0-0xffffffff><hex 0x0-0xffffffff><hex 0x0-0xffffffff></p> <p>packet_content_mask {offset_0-15 <hex 0x0-0xffffffff><hex 0x0-0xffffffff><hex 0x0-0xffffffff><hex 0x0-0xffffffff> offset_16-31 <hex 0x0-0xffffffff><hex 0x0-0xffffffff><hex 0x0-0xffffffff> offset_32-47 <hex 0x0-0xffffffff><hex 0x0-0xffffffff><hex 0x0-0xffffffff> offset_48-63 <hex 0x0-0xffffffff><hex 0x0-0xffffffff><hex 0x0-0xffffffff><hex 0x0-0xffffffff> offset_64-79 <hex 0x0-0xffffffff><hex 0x0-0xffffffff><hex 0x0-0xffffffff><hex 0x0-0xffffffff><hex 0x0-0xffffffff>} permit</p> <p>replace_priority_with <value 0-7></p> <p>replace_dscp_with<value 0-63></p> <p>deny</p> <p>delete</p> <p>access_id <value 1-255></p>
show access_profile	profile_id <value 1-8>

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

Access profiles allow you to establish criteria to determine whether 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, and specify deny:

create access_profile ip source_ip_mask 255.255.255.0 profile_id 1 deny

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

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

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.

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

flag_mask – Specifies the TCP flag fields.

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

user_define_mask – Specifies that the rule applies to the IP protocol ID and the mask options behind the IP header.

packet_content_mask – Specifies the frame content mask. There is a maximum of 5 offsets that can be configured. Each offset must be 16 bytes in length. The mask can be up to 80 bytes in length, consisting of up to 5 offsets of 16 bytes each (5 x 16 bytes + 80 bytes). The packet content mask covers the first 80 bytes of a frame. Up to 5 offsets from the first byte of the frame can be specified with each offset consisting of 16 bytes.

port – Specifies a range of ports to be configured.

profile_id – Specifies the index of the access list profile.

Restrictions

Only administrator-level users can issue this command.

Example Usage:

To create an access profile:

```
DGS-3224TGR:4#create access_profile ethernet vlan 802.1p port all profile_id 1
Command: create access_profile ethernet vlan 802.1p port all profile_id 1

Success.

DGS-3224TGR: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	<i>profile_id</i> <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:

```
DGS-3224TGR:4#delete access_profile profile_id 1  
Command: delete access_profile profile_id 1
```

```
Success.
```

```
DGS-3224TGR: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(80) access_id(10) <value 1-255>[ethernet(1) { vlan(2) <vlan_name 32> source_mac(3) <macaddr> destination_mac(4) <macaddr> 802.1p(5) <value 0-7> ethernet_type(6) <hex 0x0-0xffff>}(1) ip(21){ vlan(22) <vlan_name 32> source_ip(23) <ipaddr> destination_ip(24) <ipaddr> dscp(25) <value 0-63> [icmp(26) {type(27) <value 0-255> code(28) <value 0-255>} igmp(29) {type(30) <value 0-255>} tcp(31) {src_port(32) <value 0-65535> dst_port(33) <value 0-65535> flag_mask(46) [all(45) urg(39) ack(40) psh(41) rst(42) syn(43) fin(44)}(1)] udp(34) {src_port(35) <value 0-65535> dst_port(36) <value 0-65535>} protocol_id(37) <value 0 - 255> {user_define(38) <hex 0x0-0xffffffff><hex 0x0-0xffffffff><hex 0x0-0xffffffff><hex 0x0-0xffffffff><hex 0x0-0xffffffff>}] } (1) packet_content_mask(51) {offset_0-15(52) <hex 0x0-0xffffffff><hex 0x0-0xffffffff><hex 0x0-0xffffffff><hex 0x0-0xffffffff> offset_16-31(53) <hex 0x0-0xffffffff><hex 0x0-0xffffffff><hex 0x0-0xffffffff><hex 0x0-0xffffffff> offset_32-47(54) <hex 0x0-0xffffffff><hex 0x0-0xffffffff><hex 0x0-0xffffffff><hex 0x0-0xffffffff> offset_48-63(55) <hex 0x0-0xffffffff><hex 0x0-0xffffffff><hex 0x0-0xffffffff><hex 0x0-0xffffffff> offset_64-79(56) <hex 0x0-0xffffffff><hex 0x0-0xffffffff><hex 0x0-0xffffffff><hex 0x0-0xffffffff>} (1)] [permit(63){replace_priority_with(60) <value 0-7> replace_dscp_with(62) <value 0-63> } deny(64)] delete(81) access_id <value 1-8>] </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.

config access_profile

Parameters	<p><i>profile_id</i> <value 1-8> – An integer between 1 and 8 that is used to identify the access profile that will be configured with this command.</p> <p><i>add access_id</i> <value 1-255> – Adds an additional rule to the above specified access profile. The value specifies the relative priority of the additional rule. A lower access ID, the higher the priority the rule will be given.</p> <p><i>ethernet</i> – Specifies that the switch will look only into the layer 2 part of each packet.</p> <p><i>vlan</i> <vlan_name 32> – Specifies that the access profile will apply to only to this VLAN.</p> <p><i>source_mac</i> <macaddr> – Specifies that the access profile will apply to only packets with this source MAC address.</p> <p><i>destination_mac</i> <macaddr> – Specifies that the access profile will apply to only packets with this destination MAC address.</p> <p><i>802.1p</i> <value 0-7> – Specifies that the access profile will apply only to packets with this 802.1p priority value.</p> <p><i>ethernet_type</i> <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><i>ip</i> – Specifies that the switch will look into the IP fields in each packet.</p> <p><i>vlan</i> <vlan_name 32> – Specifies that the access profile will apply to only to this VLAN.</p> <p><i>source_ip</i> <ipaddr> – Specifies that the access profile will apply to only packets with this source IP address.</p> <p><i>destination_id</i> <value 0-255> – Specifies that the access profile will apply to only packets with this destination IP address.</p> <p><i>dscp</i> <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.</p> <p><i>icmp</i> – Specifies that the switch will examine the Internet Control Message Protocol (ICMP) field within each packet.</p> <p><i>type</i> <value 0-65535> – Specifies that the access profile will apply to this ICMP type value.</p> <p><i>code</i> <value 0-255> – Specifies that the access profile will apply to this ICMP code.</p>
-------------------	--

config access_profile

Parameters	<p><i>igmp</i> – Specifies that the switch will examine the Internet Group Management Protocol (IGMP) field within each packet.</p> <p><i>type</i> <value 0-255> – Specifies that the access profile will apply to packets that have this IGMP type value.</p> <p><i>tcp</i> – Specifies that the switch will examine the Transmission Control Protocol (TCP) field within each packet.</p> <p><i>src_port</i> <value 0-65535> – Specifies that the access profile will apply only to packets that have this TCP source port in their TCP header.</p> <p><i>dst_port</i> <value 0-65535> – Specifies that the access profile will apply only to packets that have this TCP destination port in their TCP header.</p> <p><i>flag_mask</i> – Specifies the TCP flag fields .</p> <p><i>udp</i> – Specifies that the switch will examine the Universal Datagram Protocol (UDP) field in each packet.</p> <p><i>src_port</i> <value 0-65535> – Specifies that the access profile will apply only to packets that have this UDP source port in their header.</p> <p><i>dst_port</i> <value 0-65535> – Specifies that the access profile will apply only to packets that have this UDP destination port in their header.</p> <p><i>protocol_id</i> <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.</p> <p><i>user_define</i> <hex 0x0-0xffffffff> – Specifies a mask to be combined with the value found in the frame header using a logical AND operation.</p> <p><i>packet_content_mask</i> – Specifies the frame content mask. There is a maximum of 5 offsets that can be configured. Each offset must be 16 bytes in length. The mask can be up to 80 bytes in length, consisting of up to 5 offsets of 16 bytes each (5 x 16 bytes + 80 bytes). The packet content mask covers the first 80 bytes of a frame. Up to 5 offsets from the first byte of the frame can be specified with each offset consisting of 16 bytes.</p> <p><i>priority</i> <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.</p> <p><i>replace_priority_with</i> – 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.</p> <p><i>replace_dscp_with</i> – 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 overwrite the value in the DSCP field of the packet.</p> <p><i>permit</i> – Specifies the packets that match the access profile are permit by the switch</p> <p><i>deny</i> – Specifies the packets that match the access profile are filtered by the switch</p> <p><i>delete</i> <value 1-255> – Specifies that the access ID of a rule you want to delete.</p>
Restrictions	Only administrator-level users can issue this command.

Example Usage:

To configure the access profile:

```
DGS-3224TGR:4#config access_profile profile_id 1 add access_id 1 ethernet vlan default 802.1p 5
permit
Command: config access_profile profile_id 1 add access_id 1 ethernet vlan default 802.1p 5 permit

Success.

DGS-3224TGR: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	None.

Example Usage:

To display all of the currently configured access profiles on the switch:

```
DGS-3224TGR:4#show access_profile
Command: show access_profile

Access Profile Table

Access Profile ID : 1
Type              : Ethernet Frame Filter
Ports             : All
Masks             : VLAN      802.1p
                   -----

ID Mode
-----

Total Entries : 0

DGS-3224TGR:4#
```

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SSH COMMANDS

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

Command	Parameters
config ssh algorithm	[3DES Blowfish MD5 SHA1 DSA RSA] [enable disable]
show ssh algorithm	
config ssh authmode	[password publickey hostbased] [enable disable]
show ssh authmode	
config ssh user	<username> authmode [Publickey Password Hostbased [host_name <domain_name 32> hostname_IP <domain_name 32> <ipaddr>]]
show ssh user	
config ssh server	{maxsession <int 1-8> contimeout <sec 20-600> authfail <int 2-20> rekey [10min 30min 60min never] port <tcp_port_number 1-65535>}
show ssh server	
enable ssh	
disable ssh	

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

config ssh algorithm

Purpose	Used to configure the SSH algorithm.
Syntax	config ssh algorithm [3DES Blowfish MD5 SHA1 DSA RSA] [enable disable]
Description	This command allows you to configure the desired type of SSH algorithm.
Parameters	<i>[3DES Blowfish MD5 SHA1 DSA RSA]</i> – Choose the desired security algorithm. <i>[enable disable]</i> – This allows you to enable or disable the SSH algorithm.
Restrictions	Only administrator-level users can issue this command.

Usage Example:

To configure SSH algorithm:

```
DGS-3224TGR:4#config ssh algorithm Blowfish enable
Command: show ssh algorithm Blowfish enable

Success.

DGS-3224TGR:4#
```

show ssh algorithm

Purpose	Used to display the SSH algorithm setting.
Syntax	show ssh algorithm
Description	This command will display the current SSH algorithm setting status.
Parameters	None.
Restrictions	None.

Usage Example:

To display the SSH algorithm:

```
DGS-3224TGR:4#show ssh algorithm
Command: show ssh algorithm

Encryption Algorithm:
3DES      : Enable
Blowfish  : Enable
MD5       : Enable
SHA       : Enable
RSA       : Enable
DSA       : Enable

DGS-3224TGR:4#
```

config ssh authmode

Purpose	Used to configure the SSH authentication mode setting.
Syntax	config ssh authmode [password publickey hostbased] [enable disable]
Description	This command will allow you to configure the SSH authentication mode.
Parameters	<i>[password publickey hostbased]</i> – Choose the desired SSH authentication mode. <i>[enable disable]</i> – This allows you to enable or disable SSH authentication.
Restrictions	Only administrator-level users can issue this command.

Usage Example:

To display the SSH algorithm:

```
DGS-3224TGR:4#show ssh algorithm
Command: show ssh algorithm
```

```
Encryption Algorithm
MD5      : Enabled
SHA1     : Enabled
DSA      : Enabled
RSA      : Enabled
3DES     : Enabled
Blowfish : Enabled
```

```
DGS-3224TGR:4#
```

show ssh authmode

Purpose	Used to display the SSH authentication mode setting.
Syntax	show ssh authmode
Description	This command will allow you to display the current SSH authentication mode.
Parameters	None.
Restrictions	None.

Usage Example:

To display the SSH authmode:

```
DGS-3224TGR:4#show ssh authmode
Command: show ssh authmode
```

```
Authentication Algorithm
Hostbased : Enabled
Password  : Enabled
Publickey : Enabled
```

```
DGS-3224TGR:4#
```

config ssh user

Purpose	Used to configure the SSH user.
Syntax	config ssh user <username> authmode [Publickey Password Hostbased [host_name <domain_name 32> hostname_IP <domain_name 32> <ipaddr>]]
Description	This command allows you to modify the parameters of the SSH user.
Parameters	<p><i><username></i> – Enter an optional SSH user name.</p> <p><i>authmode</i> – Select the type of security authentication mode: [Publickey Password Hostbased [host_name <domain_name 32> hostname_IP <domain_name 32> <ipaddr>]].</p>
Restrictions	Only administrator-level users can issue this command.

Usage Example:

To configure the SSH user:

```
DGS-3224TGR:4#config ssh user Sibyl authmode Hostbased hostname_IP 172.18.211.200
Command: config ssh user Sibyl authmode Hostbased hostname_IP 172.18.211.200

Success.

DGS-3224TGR:4#
```

show ssh user

Purpose	Used to display the SSH user setting.
Syntax	show ssh user
Description	This command allows you to display the current SSH user setting.
Parameters	None.
Restrictions	None.

Usage Example:

To display the SSH user:

```
DGS-3224TGR:4#show ssh user
Command: show ssh user

Account is empty!

DGS-3224TGR:4#
```

config ssh server

Purpose	Used to configure the SSH server.
Syntax	config ssh server {maxsession <int 1-8> contimeout <sec 120-600> authfail <int 2-20> rekey [10min 30min 60min never]}
Description	This command allows you to configure the SSH server.
Parameters	<p><i>maxsession <int 1-8></i> – Allows the user to set the number of times an outside guest may attempt to log on to the switch.</p> <p><i>contimeout <sec 120-600></i> – Allows the user to set the connection timeout.</p> <p><i>authfail <int 2-20></i> – Allows the user to set the maximum number of authentication fail attempts.</p> <p><i>rekey [10min 30min 60min never]</i> – Sets the time period that the switch will change the security shell encryptions.</p> <p><i>port</i> –TCP port number.</p>
Restrictions	Only administrator-level users can issue this command.

Usage Example:

To configure the SSH server:

```
DGS-3224TGR:4#config ssh server maxsession 8 contimeout 300 authfail 2
Command: config ssh server maxsession 8 contimeout 300 authfail 2

Success.

DGS-3224TGR:4#
```

show ssh server

Purpose	Used to display the SSH server setting.
Syntax	show ssh server
Description	This command allows you to display the current SSH server setting.
Parameters	None.
Restrictions	None.

Usage Example:

To display the SSH server:

```
DGS-3224TGR:4#show ssh server
Command: show ssh server
The SSH server configuration:
max Session      : 8
Connection timeout : 300
Authfail attempts : 2
Rekey Timeout    : never
SSH server status : Disable
Listened Port Number : 22

DGS-3224TGR:4#
```

enable ssh

Purpose	Used to enable SSH.
Syntax	enable ssh
Description	This command allows you to enable SSH on the switch.
Parameters	None.
Restrictions	Only administrator-level users can issue this command.

Usage Example:

To enable SSH:

```
DGS-3224TGR:4#enable ssh
Command: enable ssh

Success.

DGS-3224TGR:4#
```

disable ssh

Purpose	Used to disable SSH.
Syntax	disable ssh
Description	This command allows you to disable SSH on the switch.
Parameters	None.
Restrictions	Only administrator-level users can issue this command.

Usage Example:

To disable SSH:

```
DGS-3224TGR:4#disable ssh
Command: disable ssh

Success.

DGS-3224TGR:4#
```

SSL COMMANDS

Secure Sockets Layer or SSL is a security feature that will provide a secure communication path between a host and client through the use of authentication, digital signatures and encryption. These security functions are implemented through the use of a ciphersuite, which is a security string that determines the exact cryptographic parameters, specific encryption algorithms and key sizes to be used for an authentication session and consists of three levels:

1. **Key Exchange:** The first part of the cyphersuite string specifies the public key algorithm to be used. This switch utilizes the Rivest Shamir Adleman (RSA) public key algorithm and the Digital Signature Algorithm (DSA), specified here as the *DHE_DSS* Diffie-Hellman (DHE) public key algorithm. This is the first authentication process between client and host as they “exchange keys” in looking for a match and therefore authentication to be accepted to negotiate encryptions on the following level.
2. **Encryption:** The second part of the ciphersuite that includes the encryption used for encrypting the messages sent between client and host.
3. **Hash Algorithm:** This part of the ciphersuite allows the user to choose a message digest function which will determine a Message Authentication Code. This Message Authentication Code will be encrypted with a sent message to provide integrity and prevent against replay attacks. The switch supports two hash algorithms, *MD5* (Message Digest 5) and *SHA* (Secure Hash Algorithm).

These three parameters are uniquely assembled in four choices on the switch to create a three layered encryption code for secure communication between the server and the host. The user may implement any one or combination of the ciphersuites available, yet different ciphersuits will effect the security level and the performance of the secured connection. The information included in the ciphersuites is not included with the switch and requires downloading from a thirs source in a file form called a *certificate*. This function of the switch by utilizing a TFTP server. The switch supports SSLv3 and TLSv1, other version of SSL may not be compatible with this switch and may cause problems upon authentication and transfer of messages from client to host.

Command	Parameters
enable ssl	[ciphersuite {RSA_with_RC4_128_MD5 RSA_with_3DES_EDE_CBC_SHA DHE_DSS_with_3DES_EDE_CBC_SHA RSA_EXPORT_with_RC4_40_MD5} version {ssl_v3 tls_v1}]
disable ssl	[ciphersuite {RSA_with_RC4_128_MD5 RSA_with_3DES_EDE_CBC_SHA DHE_DSS_with_3DES_EDE_CBC_SHA RSA_EXPORT_with_RC4_40_MD5} version {ssl_v3 tls_v1}]
show ssl	
show certificate	
download certificate	<ipaddr> certfilename <path_filename 64> keyfilename <path_filename 64>

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

enable ssl

Purpose	To enable the SSL function on the switch.
Syntax	enable ssl [ciphersuite {RSA_with_RC4_128_MD5 RSA_with_3DES_EDE_CBC_SHA DHE_DSS_with_3DES_EDE_CBC_SHA RSA_EXPORT_with_RC4_40_MD5} version {ssl_v3 tls_v1}]
Description	This command will enable SSL on the switch by implementing any one or combination of listed ciphersuites on the switch. This command will also enable the SSL v3 or TLS v1 status on the switch. Enabling SSL will automatically disable the web-manager on the switch.
Parameters	<p><i>ciphersuite</i> - A security string that determines the exact cryptographic parameters, specific encryption algorithms and key sizes to be used for an authentication session. The user may choose any combination of the following:</p> <ul style="list-style-type: none"> ▪ <i>RSA_with_RC4_128_MD5</i> – This ciphersuite combines the RSA key exchange, stream cipher RC4 encryption with 128-bit keys and the MD5 Hash Algorithm. ▪ <i>RSA_with_3DES_EDE_CBC_SHA</i> – This ciphersuite combines the RSA key exchange, CBC Block Cipher 3DES_EDE encryption and the SHA Hash Algorithm. ▪ <i>DHE_DSS_with_3DES_EDE_CBC_SHA</i> – This ciphersuite combines the DSA Diffie Hellman key exchange, CBC Block Cipher 3DES_EDE encryption and SHA Hash Algorithm. ▪ <i>RSA_EXPORT_with_RC4_40_MD5</i> – This ciphersuite combines the RSA Export key exchange, stream cipher RC4 encryption with 40-bit keys. <p>The ciphersuites are enabled by default on the switch, yet the SSL status is disabled by default.</p> <p><i>version</i> – A version string that determines the exact version of SSL to be used for the communication. The user may choose one or both of the following:</p> <ul style="list-style-type: none"> ▪ <i>ssl_v3</i> ▪ <i>tls_v1</i>
Restrictions	Only administrator-level users can issue this command.

Usage Example:

To enable SSL v3 on the switch:

```
DGS-3224TGR:4#enable ssl version ssl_v3  
Command: enable ssl version ssl_v3
```

**Note: WEB will be disabled if SSL is enabled.
Success.**

```
DGS-3224TGR:4#
```



NOTE: Enabling the SSL function on the switch will disable the port for the web manager (port 80). To log on to the web based manager, the entry of your url must begin with *https://*. (ex. *https://10.90.90.90*)

disable ssl

Purpose	To disable the SSL function on the switch.
Syntax	disable ssl [ciphersuite {RSA_with_RC4_128_MD5 RSA_with_3DES_EDE_CBC_SHA DHE_DSS_with_3DES_EDE_CBC_SHA RSA_EXPORT_with_RC4_40_MD5} version {ssl_v3 tls_v1}]
Description	This command will disable SSL on the switch and can be used to disable any one or combination of listed ciphersuites on the switch.
Parameters	<p><i>ciphersuite</i> - A security string that determines the exact cryptographic parameters, specific encryption algorithms and key sizes to be used for an authentication session. The user may choose any combination of the following:</p> <ul style="list-style-type: none"> ▪ <i>RSA_with_RC4_128_MD5</i> – This ciphersuite combines the RSA key exchange, stream cipher RC4 encryption with 128-bit keys and the MD5 Hash Algorithm. ▪ <i>RSA_with_3DES_EDE_CBC_SHA</i> - This ciphersuite combines the RSA key exchange, CBC Block Cipher 3DES_EDE encryption and the SHA Hash Algorithm. ▪ <i>DHE_DSS_with_3DES_EDE_CBC_SHA</i> - This ciphersuite combines the DSA Diffie Hellman key exchange, CBC Block Cipher 3DES_EDE encryption and SHA Hash Algorithm. ▪ <i>RSA_EXPORT_with_RC4_40_MD5</i> - This ciphersuite combines the RSA Export key exchange, stream cipher RC4 encryption with 40-bit keys. <p><i>version</i> - A version string that determines the exact version of SSL to be used for the communication. The user may choose one or both of the following:</p> <ul style="list-style-type: none"> ▪ <i>ssl_v3</i> ▪ <i>tls_v1</i>
Restrictions	Only administrator-level users can issue this command.

Usage Example:

To disable the SSL v3 status on the switch:

```
DGS-3224TGR:4#disable ssl version ssl_v3
Command: disable ssl version ssl_v3
```

```
SSL V3 successfully disabled.
Success.
```

```
DGS-3224TGR:4#
```

To disable ciphersuite RSA_EXPORT_with_RC4_40_MD5 only:

```
DGS-3224TGR:4#disable ssl ciphersuite RSA_EXPORT
with_RC4_40_MD5
```

```
Command: disable ssl ciphersuite RSA_EXPORT
with_RC4_40_MD5
Success.
```

```
DGS-3224TGR:4#
```

show ssl

Purpose	Used to view the SSL status and the ciphersuites status on the switch.
Syntax	show ssl
Description	This command is used to view the SSL status on the switch.
Parameters	None.
Restrictions	None.

Usage Example:

To view the SSL status and ciphersuites status on the switch:

```
DGS-3224TGR:4#sh ssl
```

```
Command: show ssl
```

```
SSL version 3                               Disabled
TLS version 1                               Disabled
RSA_WITH_RC4_128_MD5                        0x0004 Enabled
RSA_WITH_3DES_EDE_CBC_SHA                   0x000A Enabled
DHE_DSS_WITH_3DES_EDE_CBC_SHA               0x0013 Enabled
RSA_EXPORT_WITH_RC4_40_MD5                  0x0003 Disabled
```

```
DGS-3224TGR:4#
```

show certificate

Purpose	Used to view the SSL certificate file status on the switch.
Syntax	show certificate
Description	This command is used to view the certificate file status on the switch.
Parameters	None.
Restrictions	None.

Usage Example:

To show the certificate file status on the switch:

```
DGS-3224TGR:4#show certificate
Command: show certificate
```

```
No Certificate Loaded!
DGS-3224TGR:4#
```

download certificate

Purpose	Used to download a certificate file for the SSL function on the switch.
Syntax	download certificate <ipaddr> certfilename <path_filename 64> keyfilename <path_filename 64>
Description	This command is used to download a certificate file for the SSL function on the switch from a TFTP server. The certificate file is a data record used for authenticating devices on the network. It contains information on the owner, keys for authentication and digital signatures. Both the server and the client must have consistent certificate files for optimal use of the SSL function. The switch only supports certificate files with .der file extensions.
Parameters	<p><i><ipaddr></i> - Enter the IP address of the TFTP server.</p> <p><i>certfilename <path_filename 64></i> - Enter the path and the filename of the certificate file you wish to download.</p> <p><i>keyfilename <path_filename 64></i> - Enter the path and the filename of the key exchange file you wish to download.</p>
Restrictions	Only administrator-level users can issue this command.

Example usage:

To download certificate file and key file to the switch:

```
DGS-3224TGR:4#download certificate 172.18.211.69 certfilename
cert.der keyfilename pkey.der
Command: download certificate 172.18.211.69 certfilename
cert.der keyfilename pkey.der

Certificate Loaded Successfully!
DGS-3224TGR:4#
```

ACCESS AUTHENTICATION CONTROL COMMANDS

The Access Authentication Control commands let you secure access to the Switch using the TACACS/XTACACS/TACACS+ protocols. When a user logs in to the Switch or tries to access the administrator level privilege, he or she is prompted for a password. If TACACS/XTACACS/TACACS+ authentication is enabled on the Switch, it will contact a TACACS/XTACACS/TACACS+ server to verify the user. If the user is verified, he or she is granted access to the Switch.

There are currently three versions of the TACACS security protocol, each a separate entity. The Switch's software supports the following versions of TACACS:

- TACACS (Terminal Access Controller Access Control System) —Provides password checking and authentication, and notification of user actions for security purposes utilizing via one or more centralized TACACS servers, utilizing the UDP protocol for packet transmission.
- Extended TACACS (XTACACS) — An extension of the TACACS protocol with the ability to provide more types of authentication requests and more types of response codes than TACACS. This protocol also uses UDP to transmit packets.
- TACACS+ (Terminal Access Controller Access Control System plus) — Provides detailed access control for authentication for network devices. TACACS+ is facilitated through Authentication commands via one or more centralized servers. The TACACS+ protocol encrypts all traffic between the Switch and the TACACS+ daemon, using the TCP protocol to ensure reliable delivery.

In order for the TACACS/XTACACS/TACACS+ security function to work properly, a TACACS/XTACACS/TACACS+ server must be configured on a device other than the Switch, called a *server host* and it must include usernames and passwords for authentication. When the user is prompted by the Switch to enter usernames and passwords for authentication, the Switch contacts the TACACS/XTACACS/TACACS+ server to verify, and the server will respond with one of three messages:

- A) The server verifies the username and password, and the user is granted normal user privileges on the Switch.
- B) The server will not accept the username and password and the user is denied access to the Switch.
- C) The server doesn't respond to the verification query. At this point, the Switch receives the timeout from the server and then moves to the next method of verification configured in the method list.

The Switch has three built-in *server groups*, one for each of the TACACS, XTACACS, and TACACS+ protocols. These built-in *server groups* are used to authenticate users trying to access the Switch. The users will set *server hosts* in a preferable order in the built-in *server group* and when a user tries to gain access to the Switch, the Switch will ask the first *server host* for authentication. If no authentication is made, the second *server host* in the list will be queried, and so on. The built-in *server group* can only have hosts that are running the specified protocol. For example, the TACACS *server group* can only have TACACS *server hosts*.

The administrator for the Switch may set up five different authentication techniques per user-defined *method list* (TACACS/XTACACS/TACACS+/local/none) for authentication. These techniques will be listed in an order preferable, and defined by the user for normal user authentication on the Switch, and may contain up to eight authentication techniques. When a user attempts to access the Switch, the Switch will select the first technique listed for authentication. If the first technique goes through its *server hosts* and no authentication is returned, the Switch will then go to the next technique listed in the server group for authentication, until the authentication has been verified or denied, or the list is exhausted.

Please note that user granted access to the Switch will be granted normal user privileges on the Switch. To gain access to admin level privileges, the user must enter the *enable admin* command and then enter a password, which was previously configured by the administrator of the Switch.

The Access Authentication Control commands in the Command Line Interface (CLI) are listed (along with the appropriate parameters) in the table below.



NOTE: TACACS, XTACACS and TACACS+ are separate entities and are not compatible. The Switch and the server must be configured exactly the same, using the same protocol. (For example, if the Switch is set up for TACACS authentication, so must be the host server.)

Command	Parameters
enable authentication _policy	
disable authentication _policy	
show authentication _policy	
create authentication login method_list_name	<string 15>
config authentication login	[default method_list_name <string 15>] method<string> {<string> {<string> {<string>}}
delete authentication login method_list_name	<string 15>
show authentication login	{default method_list_name <string 15>}
create authentication server_group	<string 15>
config authentication server_group	[add delete] server_host <server_ip> protocol [tacacs xtacacs tacacs+]
delete authentication server_group	<string 15>
show authentication server_group	{<string 15>}
create authentication server_host	<ipaddr> protocol [tacacs xtacacs tacacs+
config authentication server_host	<ipaddr> protocol [tacacs xtacacs tacacs+] {port <int 1-65535> key [<key_string 254>] timeout <int 1-255> retransmit <int 1-255>}
delete authentication server_host	<ipaddr> protocol [tacacs xtacacs tacacs+]
show authentication server_host	
config login_authentication response_timeout	<int 1-255>
config login_authentication attempt	<int 1-255>
show login_authentication	
config login_authentication	{console[default method_list_name <method_list_name>] telnet[default method_list_name<method_list_name>] all[default method_list_name <method_list_name>]}

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

enable authentication_policy

Purpose	Used to enable system access authentication policy.
Syntax	enable authentication_policy
Description	This command will enable an administrator-defined authentication policy for users trying to access the Switch. When enabled, the device will check the method list and choose a technique for user authentication upon login.
Parameters	None.
Restrictions	Only administrator-level users can issue this command.

Example usage:

To enable the system access authentication policy:

```
DGS-3224TGR:4#enable authentication_policy
Command: enable authentication_policy

Success.

DGS-3224TGR:4#
```

disable authentication_policy

Purpose	Used to disable system access authentication policy.
Syntax	disable authentication_policy
Description	This command will disable the administrator-defined authentication policy for users trying to access the Switch. When disabled, the Switch will access the local user account database for username and password verification. In addition, the Switch will now accept the local enable password as the authentication for normal users attempting to access administrator level privileges.
Parameters	None.
Restrictions	Only administrator-level users can issue this command.

Example usage:

To disable the system access authentication policy:

```
DGS-3224TGR:4#disable authentication_policy
Command: disable authentication_policy

Success.

DGS-3224TGR:4#
```

show authentication_policy

Purpose	Used to display the system access authentication policy status on the Switch.
Syntax	show authentication_policy
Description	This command will show the current status of the access authentication policy on the Switch
Parameters	None.
Restrictions	None.

Example usage:

To display the system access authentication policy:

```
DGS-3224TGR:4#show authentication_policy
Command: show authentication_policy

AAA is disabled!

DGS-3224TGR:4#
```

create authentication login method_list_name

Purpose	Used to create a user defined method list of authentication methods for users logging on to the Switch.
Syntax	create authentication login method_list_name <string 15>
Description	This command is used to create a list for authentication techniques for user login. The Switch can support up to eight method lists, but one is reserved as a default and cannot be deleted. Multiple method lists must be created and configured separately.
Parameters	<string 15> - Enter an alphanumeric string of up to 15 characters to define the given <i>method list</i> .
Restrictions	Only administrator-level users can issue this command.

Example usage:

To create the method list “Trinity.”:

```
DGS-3224TGR:4#create authentication login method_list_name
Trinity
Command: create authentication login method_list_name Trinity

Success.

DGS-3224TGR:4#
```

config authentication login

Purpose	Used to configure a user-defined or default method list of authentication methods for user login.
Syntax	config authentication login [default method_list_name <string 15>] method <string> {<string> {<string> {<string>}}
Description	<p>This command will configure a user-defined or default method list of authentication methods for users logging on to the Switch. The sequence of methods implemented in this command will affect the authentication result. For example, if a user enters a sequence of methods like tacacs – xtacacs – local, the Switch will send an authentication request to the first tacacs host in the server group. If no response comes from the server host, the Switch will send an authentication request to the second tacacs host in the server group and so on, until the list is exhausted. At that point, the Switch will restart the same sequence with the following protocol listed, xtacacs. If no authentication takes place using the xtacacs list, the local account database set in the Switch is used to authenticate the user. When the local method is used, the privilege level will be dependant on the local account privilege configured on the Switch.</p> <p>Successful login using any of these methods will give the user a “user” privilege only. If the user wishes to upgrade his or her status to the administrator level, the user must implement the enable admin command, followed by a previously configured password. (See the enable admin part of this section for more detailed information, concerning the enable admin command.)</p>
Parameters	<p><i>default</i> – The default method list for access authentication, as defined by the user. The user may choose one or a combination of up to four of the following authentication methods:</p> <ul style="list-style-type: none"> ▪ <i>tacacs</i> – Adding this parameter will require the user to be authenticated using the TACACS protocol from the remote TACACS <i>server hosts</i> of the TACACS <i>server group</i> list. ▪ <i>xtacacs</i> – Adding this parameter will require the user to be authenticated using the XTACACS protocol from the remote XTACACS <i>server hosts</i> of the XTACACS <i>server group</i> list. ▪ <i>tacacs+</i> – Adding this parameter will require the user to be authenticated using the TACACS+ protocol from the remote TACACS+ <i>server hosts</i> of the TACACS+ <i>server group</i> list.

config authentication login

method_list_name – Enter a previously implemented method list name defined by the user. The user may add one, or a combination of up to four of the following authentication methods to this method list:

- *tacacs* – Adding this parameter will require the user to be authenticated using the TACACS protocol from a remote TACACS server.
- *xtacacs* – Adding this parameter will require the user to be authenticated using the XTACACS protocol from a remote XTACACS server.
- *tacacs+* – Adding this parameter will require the user to be authenticated using the TACACS+ protocol from a remote TACACS+ server.



NOTE: Entering *none* or *local* as an authentication protocol will override any other authentication that follows it on a method list or on the default method list.

Restrictions

Only administrator-level users can issue this command.

Example usage:

To configure the user defined method list “Trinity” with authentication methods TACACS and XTACACS:

```
DGS-3224TGR:4#config authentication login method_list_name Trinity
method tacacs xtacacs
Command: config authentication login method_list_name Trinity method
tacacs xtacacs

Success.

DGS-3224TGR:4#
```

Example usage:

To configure the default method list with authentication methods XTACACS and TACACS+:

```
DGS-3224TGR:4#config authentication login default method xtacacs
tacacs+
Command: config authentication login default method xtacacs tacacs+

Success.

DGS-3224TGR:4#
```

delete authentication login method_list_name

Purpose	Used to delete a previously configured user defined method list of authentication methods for users logging on to the Switch.
Syntax	delete authentication login method_list_name <string 15>
Description	This command is used to delete a list for authentication methods for user login.
Parameters	< <i>string 15</i> > Enter an alphanumeric string of up to 15 characters to define the given <i>method list</i> the user wishes to delete.
Restrictions	Only administrator-level users can issue this command.

Example usage:

To delete the method list name "Trinity":

```
DGS-3224TGR:4#delete authentication login method_list_name
Trinity
Command: delete authentication login method_list_name Trinity

Success.

DGS-3224TGR:4#
```

show authentication login

Purpose	Used to display a previously configured user-defined method list of authentication methods for users logging on to the Switch.
Syntax	show authentication login [default method_list_name <string 15>]
Description	<p>This command is used to show a list of authentication methods for user login. The table includes the following items:</p> <ul style="list-style-type: none"> ▪ Method List Name – The name of a previously configured method list name. ▪ Entry – Index of authentication login methods. ▪ Method – Specifies which security protocols are implemented: TACACS+ is 502, default is 602, XTACACS is 702, TACACS is 802, and local is 1102. ▪ srv_group name – The name of the previously configured user-defined server group.
Parameters	<p><i>default</i> – Entering this parameter will display the default method list for users logging on to the Switch.</p> <p><i>method_list_name <string 15></i> – Enter an alphanumeric string of up to 15 characters to define the given <i>method list</i> the user wishes to view.</p>
Restrictions	Only administrator-level users can issue this command.

Example usage:

To view all method list configurations:

```
DGS-3224TGR:4#show authentication login method_list_name
Built-in Group
Command: show authentication login method_list_name Built-in
Group

Method List name: Built_in_Group
Entry[0], Method= 0, srv_group name =
Entry[1], Method= 0, srv_group name =
Entry[2], Method= 0, srv_group name =
Entry[3], Method= 0, srv_group name =
```

create authentication server_host

Purpose	Used to create an authentication server host.
Syntax	create authentication server_host <server_ip> protocol [tacacs xtacacs tacacs+]
Description	This command will create an authentication server host for the TACACS/XTACACS/TACACS+ security protocols on the Switch. When a user attempts to access the Switch with authentication protocol enabled, the Switch will send authentication packets to a remote TACACS, XTACACS, or TACACS+ server host on a remote host. The TACACS, XTACACS, or TACACS+ server host will then verify or deny the request and return the appropriate message to the Switch. More than one authentication protocol can be run on the same physical server host but, remember that TACACS, XTACACS, and TACACS+ are separate entities and are not compatible with each other. The maximum supported number of server hosts is 16.
Parameters	<p><i>server_host</i> <server_ip> – The IP address of the remote server host the user wishes to add.</p> <p><i>protocol</i> – The protocol used by the server host. The user may choose one of the following:</p> <ul style="list-style-type: none"> ▪ <i>tacacs</i> – Enter this parameter if the server host utilizes the TACACS protocol. ▪ <i>xtacacs</i> – Enter this parameter if the server host utilizes the XTACACS protocol. ▪ <i>tacacs+</i> – Enter this parameter if the server host utilizes the TACACS+ protocol.
Restrictions	Only administrator-level users can issue this command.

Example usage:

To create a TACACS+ authentication server host:

```
DGS-3224TGR:4#create authentication server_host 10.1.1.121 protocol
tacacs+
Command: create authentication server_host 10.1.1.121 protocol tacacs+

Success.

DGS-3224TGR:4#
```

config authentication server_host

Purpose	Used to configure a user-defined authentication server host.
Syntax	config authentication server_host <server_ip> protocol [tacacs xtacacs tacacs+] {port <int 1-65535> key <key_string 254> timeout <int 1-255> retransmit <int 1-255>}
Description	This command will configure a user-defined authentication server host for the TACACS/XTACACS/TACACS+ security protocols on the Switch. When a user attempts to access the Switch with authentication protocol enabled, the Switch will send authentication packets to a remote TACACS/XTACACS/TACACS+ server host on a remote host. The TACACS/XTACACS/TACACS+ server host will then verify or deny the request and return the appropriate message to the Switch. More than one authentication protocol can be run on the same physical server host but, remember that TACACS/XTACACS/TACACS+ are separate entities and are not compatible with each other. The maximum supported number of server hosts is 16.
Parameters	<p><i>server_host</i> <server_ip> – The IP address of the remote server host the user wishes to alter.</p> <p><i>protocol</i> – The protocol used by the server host. The user may choose one of the following:</p> <ul style="list-style-type: none"> ▪ <i>tacacs</i> – Enter this parameter if the server host utilizes the TACACS protocol. ▪ <i>xtacacs</i> - Enter this parameter if the server host utilizes the XTACACS protocol. ▪ <i>tacacs+</i> - Enter this parameter if the server host utilizes the TACACS+ protocol. <p><i>port</i> <int 1-65535> – Enter a number between 1 and 65535 to define the virtual port number of the authentication protocol on a server host. The default port number is 49 for TACACS/XTACACS/TACACS+ servers but the user may set a unique port number for higher security.</p> <p><i>key</i> <key_string 254> – Authentication key to be shared with a configured TACACS+ server only. Specify an alphanumeric string up to 254 characters or choose none.</p> <p><i>timeout</i> <int 1-255> – Enter the time in seconds the Switch will wait for the server host to reply to an authentication request. The default value is 5 seconds.</p> <p><i>retransmit</i> <int 1-255> – Enter the value in the retransmit field to change how many times the device will resend an authentication request when the TACACS or XTACACS server does not respond. This field is inoperable for the TACACS+ protocol.</p>
Restrictions	Only administrator-level users can issue this command.

Example usage:

To configure a TACACS authentication server host, with port number 4321, a timeout value of 12 seconds and a retransmit count of 4.

```
DGS-3224TGR:4#config authentication server_host 10.1.1.121
protocol tacacs port 4321 timeout 12 retransmit 4
Command: config authentication server_host 10.1.1.121 protocol
tacacs port 4321 timeout 12 retransmit 4
```

Success.

```
DGS-3224TGR:4#
```

delete authentication server_host

Purpose	Used to delete a user-defined authentication server host.
Syntax	delete authentication server_host <server_ip> protocol [tacacs xtacacs tacacs+]
Description	This command is used to delete a user-defined authentication server host previously created on the Switch.
Parameters	<p><i>server_host</i> <<i>server_ip</i>> – The IP address of the remote server host the user wishes to delete.</p> <p><i>protocol</i> – The protocol used by the server host the user wishes to delete. The user may choose one of the following:</p> <ul style="list-style-type: none"> ▪ <i>tacacs</i> – Enter this parameter if the server host utilizes the TACACS protocol. ▪ <i>xtacacs</i> – Enter this parameter if the server host utilizes the XTACACS protocol. ▪ <i>tacacs+</i> – Enter this parameter if the server host utilizes the TACACS+ protocol.
Restrictions	Only administrator-level users can issue this command.

Example usage:

To delete a user-defined TACACS+ authentication server host:

```
DGS-3224TGR:4#delete authentication server_host 10.1.1.121 protocol
tacacs+
Command: delete authentication server_host 10.1.1.121 protocol
tacacs+
```

Success.

```
DGS-3224TGR:4#
```

show authentication server_host

Purpose	Used to view a user-defined authentication server host.
Syntax	show authentication server_host
Description	<p>This command is used to view user-defined authentication server hosts previously created on the Switch.</p> <p>The following parameters are displayed:</p> <p>IP address – The IP address of the authentication server host.</p> <p>Protocol – The protocol used by the server host. Possible results will include TACACS, XTACACS, and TACACS+.</p> <p>Port – The virtual port number on the server host. The default value is 49.</p> <p>Timeout – The time in seconds the Switch will wait for the server host to reply to an authentication request.</p> <p>Retransmit – The value in the retransmit field denotes how many times the device will resend an authentication request when the TACACS server does not respond. This field is inoperable for the tacacs+ protocol.</p> <p>Key – Authentication key to be shared with a configured TACACS+ server only.</p>
Parameters	None.
Restrictions	Only administrator-level users can issue this command.

Example usage:

To view authentication server hosts currently set on the Switch:

```
DGS-3224TGR:4#show authentication server_host
Command: show authentication server_host

IP Address  Protocol  Port  Timeout  Retransmit  Key
-----
10.53.13.94 TACACS   49    5         2           -----

Total Entries : 1

DGS-3224TGR:4#
```

create authentication server_group

Purpose	Used to create a user-defined authentication server group.
Syntax	create authentication server_group <string 15>
Description	This command will create an authentication server group. A server group is a technique used to group TACACS, XTACACS, and TACACS+ server hosts into user defined categories for authentication using method lists. The user may add up to eight authentication server hosts to this group using the config authentication server_group command.
Parameters	<string 15> Enter an alphanumeric string of up to 15 characters to define the newly created server group.
Restrictions	Only administrator-level users can issue this command.

Example usage:

To create the server group “group_1”:

```
DGS-3224TGR:4#create authentication server_group group_1  
Command: create authentication server_group group_1
```

```
Success.
```

```
DGS-3224TGR:4#
```

config authentication server_group

Purpose	Used to create a user-defined authentication server group.
Syntax	config authen server_ <string 15>] [add delete] server_host <server_ip> protocol [tacacs xtacacs tacacs+]
Description	This command will configure an authentication server group. A server group is a technique used to group TACACS/XTACACS/TACACS+ server hosts into user defined categories for authentication using method lists. The user may define the type of server group by protocol or by previously defined server group. Up to eight authentication server hosts may be added to any particular group
Parameters	<p><i>server_group</i> – The user may define the group by protocol groups built into the Switch (TACACS/XTACACS/TACACS+), or by a user-defined group previously created using the create authentication server_group command.</p> <ul style="list-style-type: none"> ▪ <i>tacacs</i> – Use this parameter to utilize the built-in TACACS server protocol on the Switch. Only server hosts utilizing the TACACS protocol may be added to this group. ▪ <i>xtacacs</i> – Use this parameter to utilize the built-in XTACACS server protocol on the Switch. Only server hosts utilizing the XTACACS protocol may be added to this group. ▪ <i>tacacs+</i> – Use this parameter to utilize the built-in TACACS+ server protocol on the Switch. Only server hosts utilizing the TACACS+ protocol may be added to this group. ▪ <i><string 15></i> - Enter an alphanumeric string of up to 15 characters to define the previously created server group. This group may add any combination of server hosts to it, regardless of protocol. <p><i>[add delete]</i> – Enter the correct parameter to add or delete a server host from a server group.</p> <p><i>server_host <ipaddr></i> – Enter the IP address of the previously configured server host to add or delete.</p> <p><i>protocol</i> – Enter the protocol utilized by the server host. There are four options:</p> <ul style="list-style-type: none"> ▪ <i>tacacs</i> – Use this parameter to define the protocol if the server host is using the TACACS authentication protocol. ▪ <i>xtacacs</i> – Use this parameter to define the protocol if the server host is using the XTACACS authentication protocol. ▪ <i>tacacs+</i> – Use this parameter to define the protocol if the server host is using the TACACS+ authentication protocol.
Restrictions	Only administrator-level users can issue this command.

Example usage:

To add an authentication host to server group “group_1”:

```
DGS-3224TGR:4#config authentication server_group group_1 add
server_host 10.1.1.121 protocol tacacs+
Command: config authentication server_group group_1 add
server_host 10.1.1.121 protocol tacacs+

Success.

DGS-3224TGR:4#
```

delete authentication server_group

Purpose	Used to delete a user-defined authentication server group.
Syntax	delete authentication server_group <string 15>
Description	This command will delete an authentication server group.
Parameters	<string 15> - Enter an alphanumeric string of up to 15 characters to define the previously created server group the user wishes to delete.
Restrictions	Only administrator-level users can issue this command.

Example usage:

To delete the server group “group_1”:

```
DGS-3224TGR:4#delete server_group group_1
Command: delete server_group group_1

Success.

DGS-3224TGR:4#
```

show authentication server_group

Purpose	Used to view authentication server groups on the Switch.
Syntax	show authentication server_group <string 15>
Description	<p>This command will display authentication server groups currently configured on the Switch.</p> <p>This command will display the following fields:</p> <p>Group Name: The name of the server group currently configured on the Switch, including built in groups and user defined groups.</p> <p>IP Address: The IP address of the server host.</p> <p>Protocol: The authentication protocol used by the server host.</p>
Parameters	<p><string 15> - Enter an alphanumeric string of up to 15 characters to define the previously created server group to view.</p> <p>Entering this command without the <string> parameter will display all authentication server groups on the Switch.</p>
Restrictions	None.

Example usage:

To show the authentication server group:

```
DGS-3224TGR:4#show authentication server_group
Command: show authentication server_group

Group: tacacs
  IP Address          Protocol
  -----
This group has no entry!

Group: xtacacs
  IP Address          Protocol
  -----
This group has no entry!

Group: tacacs+
  IP Address          Protocol
  -----
This group has no entry!

Group: default
  IP Address          Protocol
  -----
This group has no entry!

DGS-3224TGR:4#
DGS-3224TGR:4#
```

config login_authentication response_timeout

Purpose	Used to configure the amount of time the Switch will wait for a user to enter authentication before timing out.
Syntax	config login_authentication response_timeout <int 1-255>
Description	This command will set the time the Switch will wait for a response of authentication from the user.
Parameters	<i>response_timeout <int 1-255></i> - Set the time, in seconds, the Switch will wait for a response of authentication from the user attempting to log in from the command line interface or telnet interface. An entry of 0 will denote that the Switch will never time out while waiting for a response of authentication. The default setting is 30 seconds.
Restrictions	Only administrator-level users can issue this command.

Example usage:

To configure the response timeout for 60 seconds:

```
DGS-3224TGR:4#config login_authentication response_timeout 60
Command: config login_authentication response_timeout 60
```

```
Success.
```

```
DGS-3224TGR:4#
```

config login_authentication attempt

Purpose	Used to configure the maximum number of times the Switch will accept authentication attempts.
Syntax	config login_authentication attempt <int 1-255>
Description	This command will configure the maximum number of times the Switch will accept authentication attempts. Users failing to be authenticated after the set amount of attempts will be denied access to the Switch and will be locked out of further authentication attempts. Command line interface users will have to wait 60 seconds before another authentication attempt. Telnet users will be disconnected from the Switch.
Parameters	<i>parameter attempt <int 1-255></i> - Set the maximum number of attempts the user may try to become authenticated by the Switch, before being locked out. The default setting is 3 attempts.
Restrictions	Only administrator-level users can issue this command.

Example usage:

To set the maximum number of authentication attempts at 5:

```
DGS-3224TGR:4# config login_authentication attempt 5
Command: config login_authentication attempt 5

Success.

DGS-3224TGR:4#
```

show login_authentication

Purpose	Used to display current login authentication information.
Syntax	show login_authentication
Description	This command will display the amount of time for login input and the maximum attempts for login authentication attempts.
Parameters	None.
Restrictions	None.

```
DGS-3224TGR:4#show login_authentication
Command: show login_authentication

CONSOLE :default .
TELNET  :default .

The amount of time for login input is 100 seconds!
The maximum attempts for Login authentication is 5 !

DGS-3224TGR:4#
```

config login_authentication

Purpose	Used to display current login authentication information.
Syntax	config login_authentication {console [default] method_list_name <method_list_name> } telnet [default method_list_name <method_list_name>] all [default method_list_name <method_list_name>]}
Description	This command will set authentication methods of login applications.
Parameters	<p><i>console</i> – The user may configure authentication for users utilizing the Console (Command Line Interface) application.</p> <p><i>telnet</i> – The user may configure authentication for users utilizing the Telnet application.</p> <p><i>all</i> – The user may configure authentication for users utilizing the Console and Telnet applications.</p>

config login_authentication

method_list_name <*method_list_name*> – Enter an alphanumeric string of up to 15 characters to define the login_authentication method list the user wishes to configure.

Restrictions None.

```
DGS-3224TGR:4#config login_authentication console
default
Command: config login_authentication console default

Success.

DGS-3224TGR:4#
```

TRAFFIC SEGMENTATION COMMANDS

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

Command	Parameters
<code>config traffic_segmentation</code>	<code><portlist> forward_list [null <portlist>]</code>
<code>show traffic_segmentation</code>	<code>{<portlist>}</code>

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

config traffic_segmentation

Purpose	Used to configure the traffic segmentation.
Syntax	<code>config traffic_segmentation <portlist> forward_list [null <portlist>]</code>
Description	This command configures traffic segmentation.
Parameters	<p><code><portlist></code> – Specifies a range of ports to be configured.</p> <p><code>forward_list</code> – Specifies a range of ports in the forwarding domain. The choices are: <code>portlist</code>, which specifies a range of ports to be configured and <code>null</code>, which specifies the range of ports in the forwarding domain is null.</p>
Restrictions	Only administrator-level users can issue this command. The forwarding domain is restricted to Bridge Traffic only.

Usage Example:

To configure traffic segmentation:

```
DGS-3224TGR:4# config traffic_segmentation 1-3 forward_list 11-15
Command: config traffic_segmentation 1-3 forward_list 11-15

Success.

DGS-3224TGR:4#
```

show traffic_segmentation

Purpose	Used to display the current traffic segmentation table.
Syntax	show traffic_segmentation {<portlist>}
Description	This command displays the current traffic segmentation table.
Parameters	<portlist> – Specifies a range of ports to be displayed. If no parameter is specified, the system will display all current traffic segmentation tables.
Restrictions	None.

Usage Example:

To display the traffic segmentation table:

```
DGS-3224TGR:4# show traffic_segmentation 1-3
Command: show traffic_segmentation 1-3
```

Traffic Segmentation Table

Port	Forward Portlist
1	11-15
2	11-15
3	11-15

```
DGS-3224TGR:4#
```

D-LINK SINGLE IP MANAGEMENT COMMANDS

Simply put, D-Link Single IP Management is a concept that will stack switches together over Ethernet instead of using stacking ports or modules. Switches using Single IP Management (labeled here as SIM) must conform to the following rules:

- SIM is an optional feature on the Switch and can easily be enabled or disabled. SIM grouping has no effect on the normal operation of the Switch in the user's network.
- There are three classifications for switches using SIM. The **Commander Switch (CS)**, which is the master switch of the group, **Member Switch (MS)**, which is a switch that is recognized by the CS as a member of a SIM group, and a **Candidate Switch (CaS)**, which is a switch that has a physical link to the SIM group but has not been recognized by the CS as a member of the SIM group.
- A SIM group can only have one Commander Switch (CS).
- All switches in a particular SIM group must be in the same IP subnet (broadcast domain). Members of a SIM group cannot cross a router.
- A SIM group accepts up to 32 switches (numbered 0-31), including the Commander Switch (numbered 0).
- There is no limit to the number of SIM groups in the same IP subnet (broadcast domain), however a single switch can only belong to one group.
- If multiple VLANs are configured, the SIM group will only utilize the default VLAN on any switch.
- SIM allows intermediate devices that do not support SIM. This enables the user to manage a switch that are more than one hop away from the CS.

The SIM group is a group of switches that are managed as a single entity. The switch may take on three different roles:

Commander Switch(CS) – This is a switch that has been manually configured as the controlling device for a group, and takes on the following characteristics:

- It has an IP Address.
- It is not a command switch or member switch of another Single IP group.
- It is connected to the member switches through its management VLAN.

Member Switch(MS) – This is a switch that has joined a single IP group and is accessible from the CS, and it takes on the following characteristics:

- It is not a CS or MS of another IP group.
- It is connected to the CS through the CS management VLAN.

Candidate Switch(CaS) – This is a switch that is ready to join a SIM group but is not yet a member of the SIM group. The Candidate Switch may join the SIM group through an automatic function of the Switch, or by manually configuring it to be a MS of a SIM group. A switch configured as a CaS is not a member of a SIM group and will take on the following characteristics:

- It is not a CS or MS of another Single IP group.

- It is connected to the CS through the CS management VLAN

The following rules also apply to the above roles:

1. Each device begins in a Commander state.
2. CS's must change their role to CaS and then to MS, to become a MS of a SIM group. Thus the CS cannot directly be converted to a MS.
3. The user can manually configure a CS to become a CaS.
4. A MS can become a CaS by:
 - a. Being configured as a CaS through the CS.
 - b. If report packets from the CS to the MS time out.
5. The user can manually configure a CaS to become a CS
6. The CaS can be configured through the CS to become a MS.

After configuring one switch to operate as the CS of a SIM group, additional switches may join the group by either an automatic method or by manually configuring the Switch to be a MS. The CS will then serve as the in band entry point for access to the MS. The CS's IP address will become the path to all MS's of the group and the CS's Administrator's password, and/or authentication will control access to all MS's of the SIM group.

With SIM enabled, the applications in the CS will redirect the packet instead of executing the packets. The applications will decode the packet from the administrator, modify some data, then send it to the MS. After execution, the CS may receive a response packet from the MS, which it will encode and send it back to the administrator.

When a CaS becomes a MS, it automatically becomes a member of first SNMP community (include read/write and read only) to which the CS belongs. However if a MS has its own IP address, it can belong to SNMP communities to which other switches in the group, including the CS, do not belong.

The D-Link Single IP Management commands in the Command Line Interface (CLI) are listed (along with the appropriate parameters) in the following table.

Command	Parameters
enable sim	
disable sim	
show sim	{[candidates {<candidate_id 1-100>} members {<member_id 1-32>} group {commander_mac <macaddr>} neighbor]}
reconfig	{member_id <value 1-32> exit}
config sim_group	[add <candidate_id 1-100> {<password>} delete <member_id 1-32>]
config sim	{[commander { group_name <groupname 64> candidate} dp_interval <sec 30-90> hold_time <sec 100-255>]}
download sim_ms	[firmware configuration] <ipaddr> <path_filename> [members <mclist 1-32> all]
upload sim_ms configuration	<ipaddr> <path_filename> <member_id 1-32>

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

enable sim

Purpose	Used to enable Single IP Management (SIM) on the Switch
Syntax	enable sim
Description	This command will enable SIM globally on the Switch. SIM features and functions will not function properly unless this function is enabled.
Parameters	None.
Restrictions	Only administrator-level users can issue this command.

Example usage:

To enable SIM on the Switch:

```
DGS-3224TGR:4#enable sim
Command: enable sim
```

```
Success.
```

```
DGS-3224TGR:4#
```

disable sim

Purpose	Used to disable Single IP Management (SIM) on the Switch
Syntax	disable sim
Description	This command will disable SIM globally on the Switch.
Parameters	None.
Restrictions	Only administrator-level users can issue this command.

Example usage:

To disable SIM on the Switch:

```
DGS-3224TGR:4#disable sim
Command: disable sim
```

```
Success.
```

```
DGS-3224TGR:4#
```

show sim

Purpose	Used to view the current information regarding the SIM group on the Switch.
Syntax	show sim {[candidates {<candidate_id 1-100>} members {<member_id 1-32>} group { commander_mac <macaddr>} neighbor]}
Description	<p>This command will display the current information regarding the SIM group on the Switch, including the following:</p> <p>SIM Version - Displays the current Single IP Management version on the Switch.</p> <p>Firmware Version - Displays the current Firmware version on the Switch.</p> <p>Device Name - Displays the user-defined device name on the Switch.</p> <p>MAC Address - Displays the MAC Address of the Switch.</p> <p>Capabilities – Displays the type of switch, be it Layer 2 (L2) or Layer 3 (L3).</p> <p>Platform – Switch Description including name and model number.</p> <p>SIM State –Displays the current Single IP Management State of the Switch, whether it be enabled or disabled.</p> <p>Role State – Displays the current role the Switch is taking, including Commander, Member or Candidate. A stand-alone switch will always have the candidate role.</p> <p>Discovery Interval - Time in seconds the Switch will send discovery packets out over the network.</p> <p>Hold time – Displays the time in seconds the Switch will hold discovery results before dropping it or utilizing it.</p>
Parameters	<p><i>candidates</i> <candidate_id 1-100> - Entering this parameter will display information concerning candidates of the SIM group. To view a specific candidate, include that candidate's id number, listed from 1 to 100.</p> <p><i>members</i> <member_id 1-32> - Entering this parameter will display information concerning members of the SIM group. To view a specific member, include that member's ID number, listed from 1 to 32.</p> <p><i>group commander_mac</i> <macaddr> - Entering this parameter will display information concerning the SIM group of a commander device, identified by its MAC address.</p> <p><i>neighbor</i> – Entering this parameter will display neighboring devices of the Switch. A SIM neighbor is defined as a switch that is physically connected to the Switch but is not part of the SIM group. This screen will produce the following results:</p> <ul style="list-style-type: none"> ▪ Port – Displays the physical port number of the commander switch where the uplink to the neighbor switch is located. ▪ MAC Address – Displays the MAC Address of the neighbor switch. ▪ Role – Displays the role (CS, CaS, MS) of the neighbor switch.
Restrictions	Only administrator-level users can issue this command.

Example usage:

To show the SIM information in detail:

```
DGS-3224TGR:4#show sim
Command: show sim

SIM Version      : VER-1
Firmware Version : Build 3.00-B13
Device Name      :
MAC Address      : 00-35-26-11-11-00
Capabilities     : L3
Platform        : DGS-3224TGR L3 Switch
SIM State       : Enabled
Role State      : Commander
Discovery Interval : 30 sec
Hold Time       : 100 sec

DGS-3224TGR:4#
```

To show the candidate information in summary, if the candidate id is specified:

```
DGS-3224TGR:4#show sim candidates
Command: show sim candidates

ID  MAC Address      Platform /
---  -----      Capability
1   00-01-02-03-04-00 DGS-3324SR L3 Switch   40   3.00-B13   The Man
2   00-55-55-00-55-00 DGS-3324SR L3 Switch  140   3.00-B13   default master

Total Entries: 2

DGS-3224TGR:4#
```

To show the member information in summary, if the member id is specified:

```
DGS-3224TGR:4#show sim members
Command: show sim members

ID  MAC Address      Platform /
---  -----      Capability
1   00-01-04-03-04-00 DGS-3324SR L3 Switch   40   3.00-B13   The Man
2   00-55-35-00-55-00 DGS-3324SR L3 Switch  140   3.00-B13   default master

Total Entries: 2

DGS-3224TGR:4#
```

Example usage:

To view SIM neighbors:

```
DGS-3224TGR:4#show sim neighbor
Command: show sim neighbor

Neighbor Info Table
```

Port	MAC Address	Role
23	00-35-26-00-11-99	Commander
23	00-35-26-00-11-91	Member
24	00-35-26-00-11-90	Candidate

Total Entries: 3

DGS-3224TGR:4#

To show other groups information in summary, if group is specified:

```
DGS-3224TGR:4#show sim group
Command: show sim group

SIM Group Name : default

ID  MAC Address          Platform /
---  -----          -----
*1  00-01-02-03-04-00    DGS-3324SR L3 Switch  40    3.00-B13    Trinity

SIM Group Name : default

ID  MAC Address          Platform /
---  -----          -----
2   00-55-55-00-55-00    DES-3550 L2 Switch   140    3.00-B08    Enrico

SIM Group Name : SIM2

ID  MAC Address          Platform /
---  -----          -----
*1  00-01-02-03-04-00    DES-3526 L2 Switch   40     3.00-B13    Neo
2   00-55-55-00-55-00    DES-3550 L2 Switch   140    3.00-B13    default master

** means commander switch.

DGS-3224TGR:4#
```

reconfig

Purpose	Used to connect to a member switch, through the commander switch using telnet.
----------------	--

reconfig

Syntax	reconfig {member_id <value 1-32 exit}
Description	This command is used to reconnect to a member switch using telnet.
Parameters	<p><i>member_id <value 1-32></i> - Select the ID number of the member switch the user desires to configure.</p> <p><i>exit</i> – This command is used to exit from managing the member switch and will return to managing the commander switch.</p>
Restrictions	Only administrator-level users can issue this command.

Example usage:

To connect to the MS, with member id 2, through the CS, using the command line interface:

```
DGS-3224TGR:4#reconfig member_id 2
Command: reconfig member_id 2

DGS-3224TGR:4#
```

config sim_group

Purpose	Used to add candidates and delete members from the SIM group.
Syntax	config sim_group [add <candidate_id 1-100> {<password>} delete <member_id 1-32>]
Description	This command is used to add candidates and delete members from the SIM group by ID number.
Parameters	<p><i>add <candidate_id 1-100> <password></i> - Use this parameter to change a candidate switch (CaS) to a member switch (MS) of a SIM group. The CaS may be defined by its ID number and a password (if necessary).</p> <p><i>delete <member_id 1-32></i> - Use this parameter to delete a member switch of a SIM group. The member switch should be defined by its ID number.</p>
Restrictions	Only administrator-level users can issue this command.

Example usage:

To add a member:

```
DGS-3224TGR:4#config sim_group add 2
Command: config sim_group add 2

Please wait for ACK...
SIM Config Success !!!

Success.

DGS-3224TGR:4#
```

To delete a member:

```
DGS-3224TGR:4#config sim delete 1
Command: config sim delete 1

Please wait for ACK...

Success.

DGS-3224TGR:4#
```

config sim

Purpose	Used to configure role parameters for the SIM protocol on the Switch.
Syntax	config sim [{[commander {group_name <groupname 64> candidate} dp_interval <30-90> hold_time <sec 100-255>}]
Description	This command is used to configure parameters of switches of the SIM.
Parameters	<p><i>commander</i> – Use this parameter to configure the commander switch for the following parameters:</p> <ul style="list-style-type: none"> ▪ <i>group_name <groupname 64></i> - Used to update the name of the group. Enter an alphanumeric string of up to 64 characters to rename the SIM group. ▪ <i>dp_interval <30-90></i> – The user may set the discovery protocol interval, in seconds that the Switch will send out discovery packets. Returning information to the commander switch will include information about other switches connected to it. (Ex. MS, CaS). The user may set the discovery protocol interval from 30 to 90 seconds. ▪ <i>hold time <sec 100-255></i> – Using this parameter, the user may set the time, in seconds, the Switch will hold information sent to it from other switches, utilizing the discovery interval protocol. The user may set the hold time from 100 to 300 seconds. <p><i>candidate</i> – Used to change the role of a commander switch to a candidate switch.</p> <ul style="list-style-type: none"> ▪ <i>dp_interval <30-90></i>– The user may set the discovery protocol interval, in seconds that the Switch will send out discovery packets. Returning information to the commander switch will include information about other switches connected to it. (Ex. MS, CaS). The user may set the <i>dp_interval</i> from 30 to 90 seconds. ▪ <i>hold time <sec 100-255></i>– Using this parameter, the user may set the time, in seconds, the Switch will hold information sent to it from other switches, utilizing the discovery interval protocol. The user may set the hold time from 100 to 255 seconds.
Restrictions	Only administrator-level users can issue this command.

To change the time interval of the discovery protocol:

```
DGS-3224TGR:4#config sim commander dp_interval 30
Command:config sim commander dp_interval 30
```

```
Success.
```

```
DGS-3224TGR:4#
```

To change the hold time of the discovery protocol:

```
DGS-3224TGR:4# config sim commander hold_time 120
Command: config sim commander hold_time 120

Success.

DGS-3224TGR:4#
```

To transfer the commander switch to be a candidate:

```
DGS-3224TGR:4#config sim candidate
Command: config sim candidate

Success.

DGS-3224TGR:4#
```

To transfer the Switch to be a commander:

```
DGS-3224TGR:4#config sim commander
Command: config sim commander

Success.

DGS-3224TGR:4#
```

To update the name of a group:

```
DGS-3224TGR:4#config sim commander group_name Trinity
Command: config sim commander group_name Trinity

Success.

DGS-3224TGR:4#
```

download sim_ms

Purpose	Used to download firmware or configuration file to an indicated device.
Syntax	download sim_ms [firmware configuration] <ipaddr> <path_filename> {members <mslist 1-32> all}
Description	This command will download a firmware file or configuration file to a specified device from a TFTP server.
Parameters	<p><i>firmware</i> – Specify this parameter if the user wishes to download firmware to members of a SIM group.</p> <p><i>configuration</i> - Specify this parameter if the user wishes to download a switch configuration to members of a SIM group.</p> <p><i>ipaddr</i> – Enter the IP address of the TFTP server.</p> <p><i>path_filename</i> – Enter the path and the filename of the firmware or switch on the TFTP server.</p> <p><i>members</i> – Enter this parameter to specify the members the user prefers to download firmware or switch configuration files to. The user may specify a member or members by adding one of the following:</p> <ul style="list-style-type: none"> ▪ <i><mslist 1-32></i> - Enter a value, or values to specify which members of the SIM group will receive the firmware or switch configuration. ▪ <i>all</i> – Add this parameter to specify all members of the SIM group will receive the firmware or switch configuration.
Restrictions	Only administrator-level users can issue this command.

Example usage:

To download firmware:

```
DGS-3224TGR:4# download sim firmware 10.53.13.94 c:/dgsri.had
members all
Command: download sim firmware 10.53.13.94 c:/dgsri.had members
all

This device is updating firmware. Please wait...

Download Status :

ID  MAC Address      Result
---  -
1   00-01-02-03-04-00 Success
2   00-07-06-05-04-03 Success
3   00-07-06-05-04-03 Success

DGS-3224TGR:4#
```

To download configuration files:

```
DGS-3224TGR:4#download sim configuration 10.53.13.94 c:/dgsri.txt
members all
Command: download sim configuration 10.53.13.94 c:/dgsri.txt
members all

This device is updating configuration. Please wait...

Download Status :

ID  MAC Address      Result
---  -
1   00-01-02-03-04-00 Success
2   00-07-06-05-04-03 Success
3   00-07-06-05-04-03 Success

DGS-3224TGR:4#
```

upload sim_ms configuration

Purpose	User to upload a configuration file to a TFTP server from a specified member of a SIM group.
Syntax	upload sim_ms configuration <ipaddr> <path_filename> <member_id 1-32>
Description	This command will upload a configuration file to a TFTP server from a specified member of a SIM group.
Parameters	<p><i><ipaddr></i> Enter the IP address of the TFTP server the user wishes to upload a configuration file to.</p> <p><i><path_filename></i> – Enter a user-defined path and file name on the TFTP server the user wishes to upload configuration files to.</p> <p><i><member_id 1-32></i> Enter this parameter to specify the member the user prefers to upload a switch configuration file to. The user may specify a member or members by adding the ID number of the specified member.</p>
Restrictions	Only administrator-level users can issue this command.

Example usage:

To upload configuration files to a TFTP server:

```
DGS-3224TGR:4#upload sim_ms configuration 10.55.47.1 D:\configuration.txt
1
Command: upload sim_ms configuration 10.55.47.1 D:\configuration.txt 1
Success.
DGS-3224TGR:4#
```

COMMAND HISTORY LIST

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

Command	Parameters
?	<command>
show command_history	
dir	
config command_history	<value>

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	<command> – Enter the command that you want to see the full set of parameters for.
Restrictions	None.

Usage Example:

To display all of the commands in the CLI:

```

DGS-3224TGR:4#?
Command: ?

..
?
clear
clear arptable
clear counters
clear fdb
clear log
clear port_security_entry port
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
config arp_aging time
config authentication login
config authentication server_group
config authentication server_host
CTRL+C ESC q Quit SPACE n Next Page Enter Next Entry a All

```

To display an individual command in the CLI:

```

DGS-3224TGR:4#? config account
Command: ? config account

Command: config account
Usage: <username>
Description: Used to configure user accounts.
DGS-3224TGR:4#

```

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.

Usage Example:

To display the command history:

```

DGS-3224TGR: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
DGS-3224TGR:4#

```

dir

Purpose	Used to display all commands.
Syntax	dir
Description	This command will display all commands.
Parameters	None.
Restrictions	None.

Usage Example:

To display all of the commands:

```

DGS-3224TGR:4#dir
Command: dir
..
?
clear
clear arptable
clear counters
clear fdb
clear log
clear port_security_entry port
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
config arp_aging time
config authentication login
config authentication server_group
config authentication server_host
CTRL+C [ESC] q Quit SPACE n Next Page Enter Next Entry a All

```

config command_history

Purpose	Used to configure the command history.
Syntax	config command_history <value 1-40>
Description	This command is used to configure the command history.
Parameters	<value 1-40> – This value represents the number of commands to be displayed.
Restrictions	None.

Usage Example:

To configure the command history:

```

DGS-3224TGR:4#config command_history 20
Command: config command_history 20

Success.

DGS-3224TGR:4#

```

A

TECHNICAL SPECIFICATIONS

Performance	
Transmission Method	Store-and-forward
RAM Buffer	2 MB per device
Packet Filtering/ Forwarding Rate	Full-wire speed for all connections. 1,488,095 pps per port (for 1000Mbps)
MAC Address Learning	Automatic update. Supports 16K MAC address.
Priority Queues	8 Priority Queues per port.
Forwarding Table Age Time	Max age: 10–1000000 seconds. Default = 300.

Physical and Environmental	
AC Inputs	100 – 240 VAC, 50/60 Hz (internal universal power supply)
Power Consumption	60 watts maximum
DC Fans	4 built-in 40 x 40 x 10 mm fans 1 built-in 60 x 60 x 18 mm 5400 RPM fan blower
Operating Temperature	0 to 40 degrees Celsius
Storage Temperature	-25 to 55 degrees Celsius
Humidity	Storage: 5% to 95% non-condensing
Dimensions	441mm (W) x 309mm (D) x 44mm (H), 19-inch rack-mount width 1U height
Weight	4 kg
EMI	FCC, CE Mark, C-Tick
Safety	CSA International

General	
Standards	IEEE 802.3 10BASE-T Ethernet IEEE 802.3u 100BASE-TX Fast Ethernet IEEE 802.3z Gigabit Ethernet IEEE 802.1Q Tagged VLAN IEEE 802.1P Tagged Packets IEEE 802.3ab 1000BASE-T IEEE 802.3x Full-duplex Flow Control ANSI/IEEE 802.3 NWay auto-negotiation
Protocols	CSMA/CD
Data Transfer Rates Ethernet: Fast Ethernet: Gigabit Ethernet:	Half duplex Full duplex 10 Mbps 20 Mbps 100 Mbps 200 Mbps 2000 Mbps (Full duplex only)
Topology	Star
Network Cables 10BASE-T: 100BASE-TX: 1000BASE-T: 1000BASE-LX: 1000BASE-SX: 1000BASE-LHX: 1000BASE-ZX: Mini-GBIC:	UTP Category 3, 4, 5 (100 meters max.) EIA/TIA- 568 150-ohm STP (100 meters max.) UTP Cat. 5 (100 meters max.) EIA/TIA-568 150-ohm STP (100 meters max.) UTP Cat. 5e (100 meters max.) UTP Cat. 5 (100 meters max.) EIA/TIA-568B 150-ohm STP (100 meters max.) Single-mode fiber module (10km) Multi-mode fiber module (550m) Single-mode fiber module (40km) Single-mode fiber module (80km) SFP Transceiver for 1000BASE-LX Single-mode fiber module (10km) SFP Transceiver for 1000BASE-SX Multi-mode fiber module (550m) SFP Transceiver for 1000BASE-LHX Single-mode fiber module (40km) SFP Transceiver for 1000BASE-ZX Single-mode fiber module (80km)
Number of Ports	24 x 10/100/1000 Mbps ports 4 x GBIC combo ports

