

COMPUTING

Switch Software for PCIE-9205/PCIE-9202

CLI Guide

P/N: 6806800T85M

September 2017

ARTESYN[™]
EMBEDDED TECHNOLOGIES

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Contents

About this Manual	11
1 Introduction	17
1.1 PCIE-920x Cards Port Mapping	17
1.2 Managing Switch Software using CLI	18
1.2.1 Connecting to CLI	19
2 CLI Commands	21
2.1 Switch Mode CLI	21
2.1.1 mac_ageing_time	21
2.1.2 mac_learning	22
2.1.3 add_static_mac	22
2.1.4 arp	23
2.1.5 port	23
2.1.6 vlan database	24
2.1.7 ipv4_route	25
2.1.8 ip_forwarding	26
2.1.9 error_threshold	26
2.1.10 lb database	27
2.1.11 clear_counters	27
2.1.12 log level	28
2.1.13 show_pool	28
2.1.14 show_pool_member	29
2.1.15 show_port	31
2.1.16 show_static_channel	32
2.1.17 show_running_config	33
2.1.18 show_version	33
2.1.19 show_switch	34
2.1.20 show_mirror	34
2.1.21 show_vlan	35
2.1.22 show_mac_table	36
2.1.23 show_ipv4_route	37
2.1.24 show_error_threshold	38
2.1.25 show_match_list_pending	39

2.1.26	show_rule_match_list	40
2.1.27	flush mac	40
2.1.28	show_lbg	41
2.1.29	show_lbg_distribution	43
2.1.30	flush arp	44
2.1.31	dump	45
2.1.32	save	45
2.1.33	l3l4_hash_config	46
2.1.34	health_check_status	47
2.1.35	show_health_check_status	48
2.1.36	snapshot	49
2.1.37	reload	49
2.1.38	lacp_system_priority	50
2.1.39	show_etherchannel	51
2.2	VLAN Mode CLI	53
2.2.1	vlan	53
2.3	Port CLI	54
2.3.1	description	54
2.3.2	mode	55
2.3.3	mtu	56
2.3.4	mac_learning	57
2.3.5	shutdown	57
2.3.6	static_channel_group	58
2.3.7	switchport	59
2.3.8	switchport mode access	59
2.3.9	switchport mode trunk	60
2.3.10	switchport mode hybrid	61
2.3.11	vlan_add	62
2.3.12	vlan_remove	63
2.3.13	ip_address	64
2.3.14	mirror	65
2.3.15	vlan_stacking	66
2.3.16	error_threshold	67
2.3.17	arp_ageing_time	68
2.3.18	channel_group	69
2.3.19	lacp_timeout interval	70

2.3.20	lacp_port_priority	70
2.4	Load Balancing Pool CLI	71
2.4.1	pool	71
2.4.1.1	description	72
2.4.1.2	destination ip_address	73
2.4.1.3	member	73
2.4.1.4	state	74
2.5	Match List CLI	75
2.5.1	table	75
2.5.2	match_list	76
2.5.3	priority	77
2.5.4	match_l2param	78
2.5.5	match_l3param	79
2.5.6	match_l4param	80
2.5.7	match_port	81
2.5.8	rule match_list	82
2.5.9	state	85
2.6	Load Balancing Group CLI	86
2.6.1	lbg	86
2.6.2	member	87
2.6.3	port_weight	88
2.6.4	lbg_switchover_list	89
2.6.5	lbg_backup	90
2.6.6	lbg_mode	92
2.6.7	state	93
A	Related Documentation	95
A.1	Artesyn Embedded Technologies - Embedded Computing Documentation	95

List of Tables

Table 1-1	Command Line Editing Features	18
Table 2-1	Parameters of mac_ageing_time	21
Table 2-2	Parameters of add_static_mac	22
Table 2-3	Parameters of arp	23
Table 2-4	Parameters of port	24
Table 2-5	Parameters of ipv4_route	25
Table 2-6	Parameters of error_threshold	26
Table 2-7	Parameters of clear_counters	27
Table 2-8	Parameters of log level	28
Table 2-9	Parameters of show_pool	29
Table 2-10	Parameters of show_pool_member	30
Table 2-11	Parameters of show_port	31
Table 2-12	Parameters of show_static_channel	33
Table 2-13	Parameters of show_mirror	35
Table 2-14	Parameters of show_vlan	36
Table 2-15	Parameters of show_error_threshold	38
Table 2-16	Parameters of show_match_list_pending	39
Table 2-17	Parameters of show_rule_match_list	40
Table 2-18	Parameters of flush mac	41
Table 2-19	Parameters of show_lbg	41
Table 2-20	Parameters of show_lbg_distribution	43
Table 2-21	Parameters of flush arp	44
Table 2-22	Parameters of dump	45
Table 2-23	Parameters of save	45
Table 2-24	Parameters of l3l4_hash_config	46
Table 2-25	Parameters of health_check_status	48
Table 2-26	Parameters of snapshot	49
Table 2-27	Parameters of reload	50
Table 2-28	Parameters of lacp_system_priority	51
Table 2-29	Parameters of show_etherchannel	51
Table 2-30	Parameters of vlan	53
Table 2-31	Parameters of description	54
Table 2-32	Parameters of mode	55
Table 2-33	Parameters of mtu	56
Table 2-34	Parameters of static channel group	58
Table 2-35	Parameters of switchport mode access	60

Table 2-36	Parameters of switchport mode trunk	61
Table 2-37	Parameters of switchport mode hybrid	62
Table 2-38	Parameters of vlan_add vlan	63
Table 2-39	Parameters of vlan_remove vlan	64
Table 2-40	Parameters of ip_address	65
Table 2-41	Parameters of mirror interface	65
Table 2-42	Parameters of vlan_stacking type	67
Table 2-43	Parameters of error_threshold type	68
Table 2-44	Parameters of arp_ageing_time	68
Table 2-45	Parameters of channel_group	69
Table 2-46	Parameters of lacp_timeout interval	70
Table 2-47	Parameters of lacp_timeout interval	71
Table 2-48	Parameters of pool	72
Table 2-49	Parameters of description	72
Table 2-50	Parameters of destination ip_address	73
Table 2-51	Parameters of member	74
Table 2-52	Parameters of table	76
Table 2-53	Parameters of match_list	76
Table 2-54	Parameters of priority	77
Table 2-55	Parameters of match_l2param	78
Table 2-56	Parameters of match_l3param	79
Table 2-57	Parameters of match_l4param	80
Table 2-58	Parameters of rule match_list	82
Table 2-59	Parameters of state	85
Table 2-60	Parameters of LBG	86
Table 2-61	Parameters of member	87
Table 2-62	Parameters of port_weight	88
Table 2-63	Parameters of lbg_switchover_list	89
Table 2-64	Parameters of lbg_backup	91
Table 2-65	Parameters of lbg_mode	92
Table 2-66	Parameters of state	93
Table A-1	Artesyn Embedded Technologies - Embedded Computing Publications	95

List of Figures

Figure 1-1	PCIE-9205 Port Map	17
Figure 1-2	PCIE-9202 Port Map	18

Overview of Contents

This manual describes the Switch Software CLI commands that are used to perform switching, static routing, match-lists, trunk load balancing, load balancing group and server load balancing operations on PCIE-9205/PCIE-9202 cards.

This manual contains the following chapters and appendices:

- [Introduction on page 17](#) provides a brief description about Switch Software and a procedure on how to access CLI.
- [CLI Commands on page 21](#) describes the list of CLI commands supported by Switch Software.
- [Related Documentation on page 95](#) provides a listing of related product documentation.

Abbreviations




This document uses the following abbreviations.

Abbreviation	Definition
ARP	Address Resolution Protocol
CLI	Command Line Interface
LACP	Link Aggregation Control Protocol
LBG	Load Balancing Group
MTU	Maximum Transmission Unit
PEP	PCIe End Points
RRC	Red Rock Canyon (Intel FM10xxx chip)
SLB	Server Load Balancing
SSF	System Services Framework
VEE	Virtual Execution Environment

Conventions

The following table describes the conventions used throughout this manual.

Notation	Description
0x00000000	Typical notation for hexadecimal numbers (digits are 0 through F), for example used for addresses and offsets
0b0000	Same for binary numbers (digits are 0 and 1)
bold	Used to emphasize a word
Screen	Used for on-screen output and code related elements or commands in body text
Courier + Bold	Used to characterize user input and to separate it from system output
<i>Reference</i>	Used for references and for table and figure descriptions
File > Exit	Notation for selecting a submenu
<text>	Notation for variables and keys
[text]	Notation for software buttons to click on the screen and parameter description
...	Repeated item for example node 1, node 2, ..., node 12
.	Omission of information from example/command that is not necessary at the time being
..	Ranges, for example: 0..4 means one of the integers 0,1,2,3, and 4 (used in registers)
	Logical OR

Notation	Description
 <div style="background-color: #f4a460; padding: 2px; text-align: center; font-weight: bold;">⚠ WARNING</div> <p>XX XX XX</p>	<p>Indicates a hazardous situation which, if not avoided, could result in death or serious injury</p>
 <div style="background-color: #ffff00; padding: 2px; text-align: center; font-weight: bold;">⚠ CAUTION</div> <p>XX XX XX</p>	<p>Indicates a hazardous situation which, if not avoided, may result in minor or moderate injury</p>
<div style="background-color: #0070c0; color: white; padding: 2px; text-align: center; font-weight: bold;">NOTICE</div> <p>XX XX XX</p>	<p>Indicates a property damage message</p>
 <p>XX XX</p>	<p>No danger encountered. Pay attention to important information</p>

Summary of Changes

This manual has been revised and replaces all prior editions.

Part Number	Publication Date	Description
6806800T85M	September 2017	Updated show_port on page 31, show_switch on page 34, show_mac_table on page 36, show_rule_match_list on page 40, show_etherchannel on page 51, and channel_group on page 69.
6806800T85L	August 2017	Added lacp_system_priority on page 50, channel_group on page 69, lacp_timeout interval on page 70, lacp_port_priority on page 70, and show_etherchannel on page 51 commands. Updated log level on page 28, show_port on page 31, show_mac_table on page 36, show_rule_match_list on page 40, match_port on page 81, and rule match_list on page 82 commands.
6806800T85K	July 2017	Added Figure "PCIE-9205 Port Map" on page 17 and Figure "PCIE-9202 Port Map" on page 18. Updated Chapter 1, Introduction , Chapter 2, CLI Commands (updated all commands). Added snapshot on page 49 and reload on page 49 commands.
6806800T85J	July 2017	Added Chapter 1, PCIE-920x Cards Port Mapping , on page 17. Updated Chapter 2, CLI Commands , on page 21.
6806800T85H	April 2017	Added new sections health_check_status on page 47, show_health_check_status on page 48, and Load Balancing Group CLI on page 86. Updated the sections mac_learning on page 57, mirror on page 65, match_port on page 81, rule match_list on page 82, show_lbg_distribution on page 43, and state on page 85.
6806800T85G	March 2017	Added a note in the section rule match_list on page 82.
6806800T85F	January 2017	Added a new command l3l4_hash_config on page 46 and a note in the section mac_learning on page 57. Added a new command state on page 85.
6806800T85E	October 2016	Updated Chapter 1, Introduction , on page 17. Updated the sections vlan on page 53, switchport mode trunk on page 60, vlan_remove on page 63, show_match_list_pending on page 39, member on page 73, match_l2param on page 78, match_l3param on page 79, and match_l4param on page 80.

Part Number	Publication Date	Description
6806800T85D	August 2016	Updated <i>vlan</i> on page 53, <i>mode</i> on page 55, <i>static_channel_group</i> on page 58, <i>shutdown</i> on page 57, <i>switchport</i> on page 59, <i>switchport mode trunk</i> on page 60, <i>switchport mode hybrid</i> on page 61, <i>vlan_remove</i> on page 63, and <i>ip_address</i> on page 64 commands.
6806800T85C	June 2016	Updated <i>show_pool</i> on page 28, <i>show_pool_member</i> on page 29, <i>description</i> on page 54, <i>pool</i> on page 71, <i>port</i> on page 23, <i>static_channel_group</i> on page 58, <i>clear_counters</i> on page 27, <i>show_mac_table</i> on page 36, <i>mode</i> on page 55, <i>mtu</i> on page 56, <i>switchport</i> on page 59, <i>match_list</i> on page 76, <i>priority</i> on page 77, <i>rule match_list</i> on page 82, <i>match_l2param</i> on page 78, <i>match_l3param</i> on page 79, <i>match_l4param</i> on page 80, and <i>match_port</i> on page 81 commands.
6806800T85B	April 2016	Added CLI commands <i>arp_ageing_time</i> on page 68, <i>flush mac</i> on page 40, <i>flush arp</i> on page 44, <i>dump</i> on page 45 and <i>l3l4_hash_config</i> on page 46. Updated CLI commands <i>vlan</i> on page 53, <i>destination ip_address</i> on page 73, <i>member</i> on page 73 and commands in <i>Match List CLI</i> section. Updated <i>Chapter 1, Introduction, on page 17</i> , trademarks section, and re-branded the header image.
6806800T85A	January 2016	Initial version

Introduction

Switch Software provides configuration and management interface for Artesyn PCIe-9205 and PCIe-9202 cards to carry out switching, static routing, match-lists, trunk load balancing, load balancing group, and server load balancing.

PCIe-9205 and PCIe-9202 cards differ in the number of ports and their connectivity. They also differ from where the Red Rock Canyon (RRC) switch on these cards is managed. However, there is a distinction in each of these cards with regard to use and application.

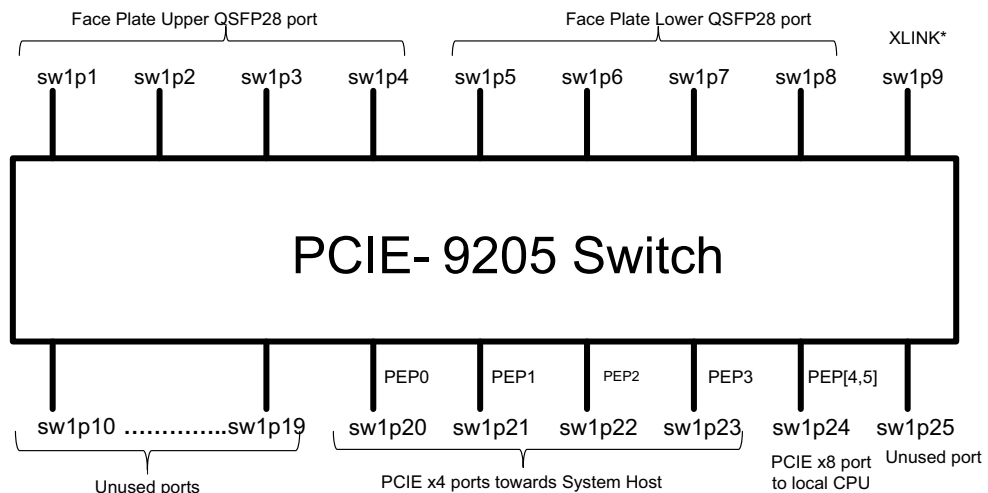
1.1 PCIe-920x Cards Port Mapping

The RRC switch on these cards consists of nine (9) PCIe End Points (PEPs) numbered as 0-8. PEP 8 is a x1 port and is commonly referred to as management interface, which is connected to a Control Plane Processor (CPP) to manage the switch. PEP 0-7 ports can operate either in 2x4 lane mode or in 1x8 lane mode.

For PCIe-9205, CPP is the onboard CPU and for PCIe-9202 CPP is the host CPU.

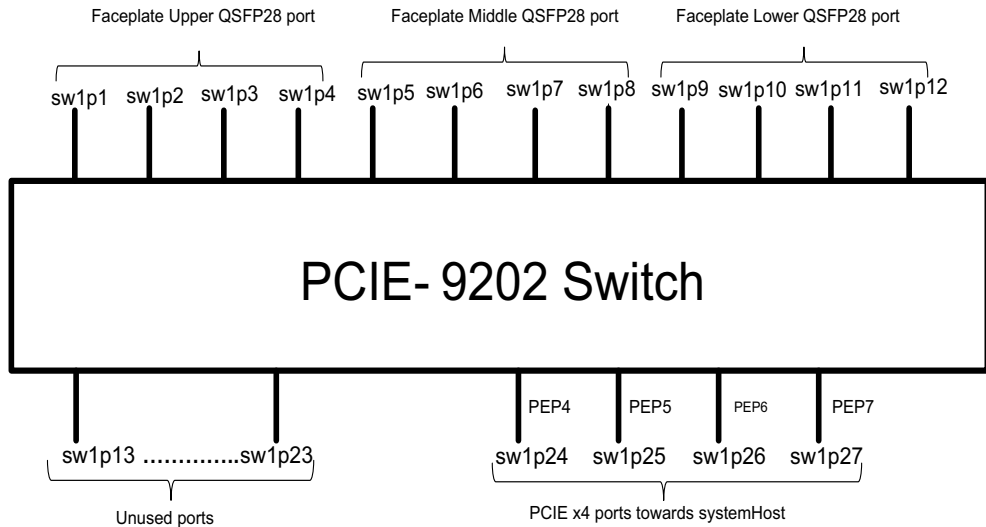
The following diagrams show the switch connectivity of PCIe-9205 and PCIe-9202 cards.

Figure 1-1 PCIe-9205 Port Map



* **XLINK** - 1000Base-X interconnection between 9205 cards in MaxCore Slot 1 and Slot 15

Figure 1-2 PCIE-9202 Port Map



1.2 Managing Switch Software using CLI

You can access CLI through telnet session. Multiple CLI sessions can be opened simultaneously. The maximum number of sessions is limited to the `maxSessions` parameter configured in `/opt/ssf/etc/config/main/cli.cfg` file.

The following table provides command-line editing features of CLI.

Table 1-1 Command Line Editing Features

Keys	Description
Left and Right arrow keys	Allows you to move the cursor within the current command line.
Up and Down arrow keys	Allows you to browse through a command history.
BACKSPACE Key	Enables you to remove the character towards left.
TAB key	Completes the keyword being entered automatically.

Table 1-1 Command Line Editing Features (continued)

Keys	Description
"?" key	Provides you context help.
<cr>	Carriage return. System displays this command when you provide all mandatory arguments of a particular CLI command. It represents the command syntax completion.

1.2.1 Connecting to CLI

You can connect to the CLI after logging into management host.

To connect to PCIE-9205 CLI, start the telnet connection from an already established secure shell:

```
# telnet localhost 11001
Trying::1...
telnet: connect to address::1: Connection refused
Trying 127.0.0.1...
Connected to localhost.
Escape character is '^]'.
Welcome to SSF CLI

Username: Admin
Password:
Access granted
>enable
#configure terminal

MaxCore(config)#system 1

MaxCore(system-1)#shelf 1

MaxCore(shelf-1-1)#PCIEslot 3

MaxCore(PCIEslot-1-1-3)#PCIECard 1

MaxCore(PCIECard-1-1-3-1)#CPU 1

MaxCore(CPU-1-1-3-1-1)#virexecenv 0
```

```
MaxCore(virExecEnv-1-1-3-1-1-0)#switch 1
```

```
MaxCore(switch-1-1-3-1-1-0-1)#
```

To connect to PCIE-9202 CLI, execute the "rrcSwitch" script.

```
# rrcSwitch
```

```
spawn telnet localhost 11001
```

```
switch 1
```

```
PCIE(switch-1-1-1-0-1)#
```

NOTICE

By default, the host IP address is configured as 127.0.0.1 and the port number is 11001. The `cli.cfg` file configures:

- **The maximum number of connections to the command line interface (CLI), default value is 5.**
- **The session time out in seconds, default value is 300.**

This chapter provides description about the list of Switch Software supported CLI commands. These CLI commands are categorized into Switch, VLAN, Port, Load Balancing Pool, Match List, and Load Balancing Pool modes.

2.1 Switch Mode CLI

This section describes all the switch-level CLI commands that are required to configure and obtain the status of the switch.

2.1.1 mac_ageing_time

Syntax

```
mac_ageing_time <AGEINGTIME>
```

```
no_mac_ageing_time
```

Description

Use this command to configure ageing-out time for the learned MAC addresses.

Use **no** form of this command to set the `mac-ageing-time` to the default value.

Table 2-1 Parameters of mac_ageing_time

Parameter	Description and Values	Default Value
AGEINGTIME	Number of seconds after which the learned MAC addresses are aged out. Range: 10-1000000 seconds	300

Example

```
# mac_ageing_time 1000
```

2.1.2 mac_learning

Syntax

```
mac_learning (enable|disable)
```

Description

Use this command to enable or disable MAC learning at switch level. By default, MAC learning is enabled on all the ports.

Example

```
# mac_learning disable
```

2.1.3 add_static_mac

Syntax

```
add_static_mac mac MAC port PORTNAME [vlan VLANID]
```

```
no_static_mac mac MAC port PORTNAME [vlan VLANID]
```

Description

Use this command to create a static MAC entry. The VLAN you specify should be already associated with the port, otherwise the command fails to execute. If no VLAN is specified, it is considered as default VLAN.

Use **no** form of this command to delete the configured static MAC entry.

Table 2-2 Parameters of add_static_mac

Parameter	Description and Values	Default Values
MAC	MAC address should be in hexadecimal format HHHH.HHHH.HHHH You need to configure the MAC address as per IEEE standards.	N/A
PORTNAME	The port on which the MAC address is reachable.	N/A
VLANID	VLAN on which the Static MAC has to be configured (Optional).	Default VLAN

Example

```
# add_static_mac mac 0100.2355.4566 port sw1p1 vlan 10
```

2.1.4 arp**Syntax**

```
arp ip_address A.B.C.D mac MAC
```

```
no_arp ip_address A.B.C.D
```

Description

Use this command to create a static Address Resolution Protocol (ARP) entry.

Use **no** form of this command to delete the already configured static ARP entry.

Table 2-3 Parameters of arp

Parameter	Description and Values	Default Values
A.B.C.D	IP address to which the ARP entry is to be added. Format is ipv4 address (A.B.C.D)	N/A
MAC	MAC address of the IP should be in hexadecimal format HHHH.HHHH.HHHH You need to configure the MAC address as per IEEE standards.	N/A

Example

```
# arp ip_address 1.1.1.1 mac 0100.2355.4566
```

2.1.5 port**Syntax**

```
port PORTNAME
```

Description

Use this command to select a port to configure and enter into the port command mode.

Table 2-4 Parameters of port

Parameter	Description and Values	Default Values
PORTNAME	<p>Name of the port.</p> <p>Range: Physical Ports, InterVLAN ports, and Static channel ports. For more information about Physical ports, refer to the section PCIE-920x Cards Port Mapping on page 17.</p> <p>InterVLAN ports: Naming convention of InterVLAN ports should be in this format. <i>vlan<SWITCHID>.<VLANID></i></p> <p>To create an InterVLAN port, see section vlan database.</p> <p>Static channel ports (SA): Naming convention of SA ports should be in this format. <i>sa<GROUPID></i></p> <p>To create a Static channel port, see section static_channel_group.</p>	N/A

Example

```
# port sw1p1
```

2.1.6 vlan database

Syntax

```
vlan database
```

Description

Use this command to enter into the VLAN mode. You can create, delete, or modify properties of VLANs.

Example

```
# vlan database
```

2.1.7 ipv4_route**Syntax**

```
ipv4_route destination DEST_PREFIX gw GW_IP
```

```
no_ipv4_route destination DEST_PREFIX gw GW_IP
```

Description

Use this command to add a IPv4 route to reach a destination network or a host through a gateway.

Use **no** form of this command to delete the configured route.

Table 2-5 Parameters of ipv4_route

Parameter	Description and Values	Default Values
DEST_PREFIX	IPv4 address of destination prefix. The address should be in IPv4 address/mask format.	N/A
GW_IP	Gateway IPv4 address through which destination is reachable. The address should be in IPv4 address format.	N/A

Example

To add a host route:

```
# ipv4_route destination 10.10.10.1/32 gw 10.10.10.100
```

To add a network route:

```
# no_ipv4_route destination 10.10.11.0/24 gw 10.10.10.200
```

2.1.8 ip_forwarding

Syntax

```
ip_forwarding [enable | disable]
```

Description

Use this command to enable or disable IP forwarding on control plane processor.

Example

```
# ip_forwarding enable
```

2.1.9 error_threshold

Syntax

```
error_threshold state STATE interval INTERVAL
```

Description

Use this command to enable or disable port error notifications to the registered application on XML interface of Switch Software. This command enables error notifications and sets a timer to the configured interval. Error notifications are sent by checking the error count at configured interval seconds. By default, these notifications are disabled.

Table 2-6 Parameters of error_threshold

Parameter	Description and Values	Default Values
STATE	Sets the state of error-thresholds to enable/disable. Possible values: enable, disable	N/A
INTERVAL	Error threshold timer interval. Range: 10 - 10800 seconds.	N/A

Example

```
# error_threshold state enable interval 100
```

2.1.10 lb database

Syntax

```
lb database
```

Description

Use this command to enter into load balancing mode in order to configure Load Balancing Group (LBG) and Server Load Balancing (SLB/ECMP Group).

Example

```
# lb database
```

2.1.11 clear_counters

Syntax

```
clear_counters [port PORTNAME] [table TABLE_ID [match_list  
MATCHLIST_ID]]
```

Description

Use this command to clear counters on the specified parameter. If no parameter is specified, the command clears all the counters including port counters and match-list counters.

Table 2-7 Parameters of clear_counters

Parameter	Description and Values	Default Values
PORTNAME	Port in which the counters are to be cleared. This is an optional parameter.	N/A
TABLE_ID	The match-list table ID for which the counters need to be cleared. This is an optional parameter. Range: all, 1-2.	N/A
MATCHLIST_ID	The match-list ID for which the counters need to be cleared. When this is provided, it is required that a TABLE_ID must be provided. This is an optional parameter. Range: 1-2048.	N/A

Example

```
# clear_counters port sw1p1
```

2.1.12 log level

Syntax

```
log level LEVEL [module MODULE]
```

Description

Use this command to set the log level for the Switch Software debugging. If no module is specified, then the specified log level is applied to all the modules.

By default, the log level is set to *info* for all the Switch Software modules.

Table 2-8 Parameters of log level

Parameter	Description and Values	Default Values
LEVEL	Log level to set. Acceptable values: fatal, error, warning, info, debug, and trace.	N/A
MODULE	Acceptable values: csm, platform, and lacp	all

Example

```
# log level info
# log level error module platform
```

2.1.13 show_pool

Syntax

```
show_pool [pool POOLID]
```

Description

Use this command to display the configuration details of all server load balancing pools or a specific pool ID.

Table 2-9 Parameters of show_pool

Parameter	Description and Values	Default Values
POOL ID	Id of the pool. Range: 1-16.	N/A

Example

```
# show_pool pool 1

Switch ID: 1; Pool ID: 1;

State: ACTIVE; Description: pool1;

Member count: 3;

Server IP Address: 1.2.3.4/32;

Match_list ID: ;
```

2.1.14 show_pool_member**Syntax**

```
show_pool_member [pool POOLID] [member POOLMEMBERID]
```

Description

Use this command to display the configuration details of all pool members or a specific pool member in a SLB or pool.

Table 2-10 Parameters of show_pool_member

Parameter	Description and Values	Default Values
POOLID	ID of the pool. Range: 1-16.	N/A
POOLMEMEBER ID	ID of the Pool member. Range: 1-512.	N/A

Example

```
# show_pool_member pool 1

Member ID: 1; State: ACTIVE;

IP Address: 192.168.130.1; MAC Address: 0000.0000.0000;

Port: ; Weight: 3;

!

Member ID: 2; State: ACTIVE;

IP Address: 192.168.129.1; MAC Address: 0000.0000.0000;

Port: ; Weight: 4;

!

Member ID: 3; State: ACTIVE;

IP Address: 192.168.131.1; MAC Address: 0000.0000.0000;

Port: ; Weight: 5;

# show_pool_member pool 1 member 1

Member ID: 1; State: ACTIVE;

IP Address: 192.168.130.1; MAC Address: 0000.0000.0000;
```

```
Port: ; Weight: 3;
```

2.1.15 show_port

Syntax

```
show_port [port PORTNAME] [[include PORTTYPE]
```

Description

Use this command to display the status and configuration details of the specified port. If port is not specified, the command displays all the ports in the switch.

If PORT TYPE is specified as *vf*, the command includes details of VFs.

Table 2-11 Parameters of show_port

Parameter	Description and Values	Default Values
PORTNAME	Name of the port.	N/A
PORTTYPE	To include specified port type. Supported value: <i>vf</i> vf: To include details of VFs along with other port information.	N/A

Example

```
# show_port port sw1p1
Switch ID: 1; Port: sw1p1;
Description: Test descr;
<BROADCAST,MULTICAST>;
Ethmode: group; speed: 0; bandwidth: AN_73;
arp_ageing_timeout: NA; mtu: 1536;
port_type: L2;
VLAN_mode: access; Default VLAN: 1;
```

```
Ingress_filter: enabled;          Acceptable_frame_type: NA;
VLAN_stacking_type: NC; ethertype: NA;
Error_threshold: NC;
Mac_learning: enabled;
IP address: NA;
Mirrored Ports: NC;
static_channel_group: NA;
LACP_channel_group: po4;LACP_mode: Passive;
LACP_port_priority: 32768;LACP_timeout: long;
Egress tagged VLANs: NC;
Egress untagged VLANs: NC;
in_packets: 0; in_bytes: 0;  in_dropped: 0; in_multicast: 0;
in_broadcast: 0;
out_packets: 0; out_bytes: 0;  out_dropped: 0; out_multicast: 0;
out_broadcast: 0;
statistics last updated on: 01-May-2015 19:24:44;
```

2.1.16 show_static_channel

Syntax

```
show_static_channel [group GROUPID]
```

Description

Use this command to display static-channel details of the switch. If group option is not given, it will list all the static channel groups in the switch.

Table 2-12 Parameters of show_static_channel

Parameter	Description and Values	Default Values
GROUPID	Static-channel group identifier. Range: 1-16.	N/A

Example

```
# show_static_channel group 1
Static Aggregator: sal;
Members: sw1pl;
```

2.1.17 show_running_config

Syntax

```
show_running_config
```

Description

Use this command to display the running configuration of the switch.

Example

```
# show_running_config
```

2.1.18 show_version

Syntax

```
show_version
```

Description

Use this command to display the version of Switch Software that is installed on the card.

Example

```
# show_version  
  
Switch Software version: 1.0.1.27
```

2.1.19 show_switch

Syntax

```
show_switch
```

Description

Use this command to display all the switch-level details.

Example

```
# show_switch  
  
Switch ID           : 1;  
State               : INSERTED;  
RouterMAC           : 0240.3c26.0001;  
IP Forwarding       : DISABLED;  
LACP System Priority : 32768;  
MAC Learning        : ENABLED;  
MAC Ageing Time     : 300;  
Error Threshold State : ENABLED;  
Error Threshold Interval : 120;  
Module/logLevel     : CSM/Debug,Platform/Info,LACP/Debug;
```

2.1.20 show_mirror

Syntax

```
show_mirror [port PORTNAME] [include PORTTYPE]
```

Description

Use this command to display the mirror configuration of the given port. If port is not specified, all the mirror configurations are displayed.

If PORT TYPE is specified as vf, the command displays the details of mirror configuration on VFs.

Table 2-13 Parameters of show_mirror

Parameter	Description and Values	Default Values
PORTNAME	Name of the port. This is an optional parameter.	N/A
PORTTYPE	Type of the port for which mirror information to be displayed. Currently, you can provide only "vf" as PORT TYPE.	N/A

Example

```
# show_mirror port sw1p1
```

```
Switch ID: 1;          Destination Port: sw1p1~Test descr;
```

```
Source Port: sw1p2~Desc;      Direction: both;
```

```
!
```

```
Switch ID: 1;          Destination Port: sw1p1~Test descr;
```

```
Source Port: sw1p3~Desc;      Direction: both;
```

2.1.21 show_vlan

Syntax

```
show_vlan [vlan VLANID]
```

Description

Use this command to display the details of the VLAN specified, including its description, state and the ports on which it is configured. If you do not specify the VLANID, details of all the configured VLANs are displayed.

Table 2-14 Parameters of show_vlan

Parameter	Description and Values	Default Values
VLANID	VLAN identifier. Range: 2-4022.	N/A

Example

```
# show_vlan vlan 10

Switch ID: 1;      VLAN ID: 10;

Description: VLAN0010;      State: ACTIVE;

InterVLAN State: DISABLED;

Tagged Ports: sw1p5;

Untagged Ports: sw1p6;
```

2.1.22 show_mac_table

Syntax

```
show_mac_table
```

Description

Use this command to display the MAC table on the node.

Example

```
# show_mac_table

Switch ID:1;
```

```

MAC Addr:0011.2233.4444;VLAN ID:2 ~ NAME;
Port:sw1p1 ~ DESC;Type:Static;!
Switch ID:1;
MAC Addr:0011.2233.4455;VLAN ID:3 ~ VLAN1.3;
Port:sw1p1 ~ DESC;Type:Dynamic;!

```



show_mac_table also list outs the MAC addresses of VFs created on the PEP.

2.1.23 show_ipv4_route

Syntax

```
show_ipv4_route
```

Description

Use this command to display the routing table on the node.

Example

```
# show_ipv4_route
```

```
Name          Value
```

```
output
```

```
Switch ID: 1;
```

```
Destination network: 10.10.10.0/24;
```

```
Gateway IP: 192.168.130.2, 192.168.130.3;
```

```
Gateway Name: sw1p1, sw1p1;
```

```
Gateway Type: STATIC, STATIC;
```

```

!

Switch ID: 1;

Destination network: 20.20.20.0/24;

Gateway IP: 192.168.130.3;

Gateway Name: sw1p1;

Gateway Type: STATIC;

!

Switch ID: 1;

Destination network: 192.168.130.0/24;

Gateway IP: 0.0.0.0;

Gateway Name: sw1p1;

Gateway Type: CONNECTED;

```

2.1.24 show_error_threshold

Syntax

```
show_error_threshold [port PORTNAME]
```

Description

Use this command to display the error thresholds configured on port(s). This command shows the configured errors, thresholds, and shutdown action.

Table 2-15 Parameters of show_error_threshold

Parameter	Description and Values	Default Values
PORTNAME	Name of the port. This is an optional parameter.	N/A

Example

```
# show_error_threshold port sw1p1

Switch ID: 1;      Port: sw1p1~Test descr;

Error Type: crc      , Alignment , Badsymbol;

Error Threshold: 2000      , 3000      , 4000;

Error Action: shutdown  , shutdown  , notify;

Error count: 0      , 0      , 0;
```

2.1.25 show_match_list_pending

Syntax

```
show_match_list_pending [table TABLEID [match_list <MATCH-LIST-
ID>]]
```

Description

Use this command to display match-list(s) that are configured and are yet to be installed on hardware.

Table 2-16 Parameters of show_match_list_pending

Parameter	Description and Values	Default Values
TABLE-ID	Table Identifier Range: 1 (TCAM0), 2 (TE)	N/A
MATCH-LIST-ID	Match-list identifier Range: 1-2048.	N/A

Example

```
# show_match_list_pending table 1
```

2.1.26 show_rule_match_list

Syntax

```
show_rule_match_list [table TABLEID [match_list <match-list-id>]]
```

Description

Use this command to display match-list(s) that are configured and installed on hardware.

Table 2-17 Parameters of show_rule_match_list

Parameter	Description and Values	Default Values
TABLE-ID	Table Identifier Range: 1 (TCAM0), 2 (TE)	N/A
MATCH-LIST-ID	Match-list identifier Range: 1-2048	N/A
PORT	To include specified port type. Supported values: vf vf: To include match-list entries that include VF ports.	N/A

Example

```
# show_rule_match_list table 1
```

2.1.27 flush mac

Syntax

```
flush mac <TYPE>
```

Description

Use this command to flush all MAC entries of a specific type given in the command input.

Table 2-18 Parameters of flush mac

Parameter	Description and Values	Default Value
TYPE	String defines the type of MAC entries to be flushed. Supported types: static, dynamic.	N/A

Example

```
# flush mac dynamic
```

2.1.28 show_lbg**Syntax**

```
show_lbg [id LBGID]
```

Description

Use this command to display the detailed information of load balancing group. If no LBG ID is specified, then the command displays the details of all the configured LBGs.

Table 2-19 Parameters of show_lbg

Parameter	Description and Values	Default Values
LBGID	The load balancing group identifier for which the details need to be displayed.	N/A

Example

```
show_lbg id 1
```

```
Switch ID: 1;LBG ID: 1;
```

```
Admin State: ENABLED;Oper State: ACTIVE;
```

```
Mode: Preemptive;
```

```
Members: sw1p1, sw1p2, sw1p3, sw1p4, sw1p5, sw1p6, sw1p7, sw1p8;
```

```
Weights: 1, 2, 3, 4,4, 3, 2, 1;

Current state: Active, Active, Active, Active, Down, Down, Down,
Down;

Configured Active: swlp1, swlp2, swlp3, swlp4;

Configured Backup: swlp8,swlp7,swlp6,swlp5;

Current Active: swlp1, swlp2, swlp3, swlp4;

Match_list ID: 1-1;

Member: swlp1;State: Active;

BackupTo: ;Switchover list: ;

Member: swlp2;State: Active;

BackupTo: ;Switchover list: ;

Member: swlp3;State: Active;

BackupTo: ;Switchover list: ;

Member: swlp4;State: Active;

BackupTo: swlp4;Switchover list: ;

Member: swlp5;State: Down;

BackupTo: ;Switchover list: ;

Member: swlp6;State: Down;

BackupTo: ;Switchover list: ;

Member: swlp7;State: Down;

BackupTo: ;Switchover list: ;

Member: swlp8;State: Down;

BackupTo: ;Switchover list: ;
```

2.1.29 show_lbg_distribution

Syntax

```
show_lbg_distribution [id LBGID] [index INDEX] [port PORT]
```

Description

Use this command to display the distribution map of the load balancing group. If no LBG ID is specified, then the command displays the distribution map of all the configured LBGs.

Table 2-20 Parameters of show_lbg_distribution

Parameter	Description and Values	Default Values
LBGID	The load balancing group identifier for which the distribution map need to be displayed.	N/A
INDEX	LBG distribution index is bin numbers. Range: 0 to 1023.	N/A
PORT	PORT is LBG member port.	N/A

Example

```
show_lbg_distribution id 1
```

```
Switch ID: 1;LBG ID: 1;
```

```
Admin State: ENABLED;
```

```
Members: sw1p1,sw1p2,sw1p3,sw1p4;
```

```
Bin count: 103, 205, 307, 409;
```

```
Distribution Map:
```

```

      0,    1,    2,    3,    4,    5,    6,    7,    8,    9;
0: sw1p1, sw1p2, sw1p3, sw1p4, sw1p2, sw1p3, sw1p4, sw1p3, sw1p4, sw1p4;
10: sw1p1, sw1p2, sw1p3, sw1p4, sw1p2, sw1p3, sw1p4, sw1p3, sw1p4, sw1p4;
20: sw1p1, sw1p2, sw1p3, sw1p4, sw1p2, sw1p3, sw1p4, sw1p3, sw1p4, sw1p4;
30: sw1p1, sw1p2, sw1p3, sw1p4, sw1p2, sw1p3, sw1p4, sw1p3, sw1p4, sw1p4;
```

```

40: sw1p1, sw1p2, sw1p3, sw1p4, sw1p2, sw1p3, sw1p4, sw1p3, sw1p4, sw1p4;
50: sw1p1, sw1p2, sw1p3, sw1p4, sw1p2, sw1p3, sw1p4, sw1p3, sw1p4, sw1p4;
60: sw1p1, sw1p2, sw1p3, sw1p4, sw1p2, sw1p3, sw1p4, sw1p3, sw1p4, sw1p4;
70: sw1p1, sw1p2, sw1p3, sw1p4, sw1p2, sw1p3, sw1p4, sw1p3, sw1p4, sw1p4;
    :      :

970: sw1p1, sw1p2, sw1p3, sw1p4, sw1p2, sw1p3, sw1p4, sw1p3, sw1p4, sw1p4;
980: sw1p1, sw1p2, sw1p3, sw1p4, sw1p2, sw1p3, sw1p4, sw1p3, sw1p4, sw1p4;

990: sw1p1, sw1p2, sw1p3, sw1p4, sw1p2, sw1p3, sw1p4, sw1p3, sw1p4, sw1p4;
1000: sw1p1, sw1p2, sw1p3, sw1p4, sw1p2, sw1p3, sw1p4, sw1p3, sw1p4, sw1p4;
1010: sw1p1, sw1p2, sw1p3, sw1p4, sw1p2, sw1p3, sw1p4, sw1p3, sw1p4, sw1p4;
1020: sw1p1, sw1p2, sw1p3, sw1p4;

!
```

2.1.30 flush arp

Syntax

```
flush arp <TYPE>
```

Description

Use this command to flush all ARP entries of a specific type given in the command input.

Table 2-21 Parameters of flush arp

Parameter	Description and Values	Default Value
TYPE	Type of ARP entries to be flushed. Supported values: static, dynamic.	N/A

Example

```
# flush arp dynamic
```

2.1.31 dump

Syntax

```
dump module MODULENAME
```

Description

Use this command to log debug information of the specified module. This log information is dumped in `/var/log/switch_sw.log` file.

Table 2-22 Parameters of dump

Parameter	Description and Values	Default Value
MODULENAME	Name of the module. Acceptable values: all, port, vlan, lag, mac, arp, route, switch, and matchlist.	N/A

2.1.32 save

Syntax

```
save [file FILENAME]
```

Description

Use this command to save the current running configuration for persistency. If the optional parameter `[file FILENAME]` is provided with this command, the current configuration is saved to the specified file.

Table 2-23 Parameters of save

Parameter	Description and Values	Default Value
FILENAME	Absolute path of the file to which configuration is to be saved.	<code>/opt/switch_sw/etc/switch_config.conf</code>



The saved configuration is persistent only when you execute the command without optional parameter.

2.1.33 l3l4_hash_config

Syntax

```
l3l4_hash_config { dscp_mask DSCP-MASK | dstip DSTIP | srcip SRCIP | l4_select L4-SELECT | protocolid PROTOCOLID | l4srcport L4SRCPORT | l4dstport L4DSRPORT | ecmp_rotation ECMP-ROTATION | symmetric_l3l4 SYMMETRIC-L3L4 }
```

Description

Use this command to mask layer3 and layer4 parameters for switch hash calculation logic.

Table 2-24 Parameters of l3l4_hash_config

Parameter	Description and Values	Default Value
DSCP-MASK	DSCP mask values. Range: 0x0 to 0x3f.	0x3f
DSTIP	To include destination IP field in hash calculation. Values: true, false.	true
SRCIP	To include source IP field in hash calculation. Values: true, false.	true
PROTOCOLID	To include layer3 protocol ID field in hash calculation. Values: true, false.	true
L4-SELECT	To include layer4 protocols in hash calculation. Values: TCP, UDP, and two custom values in range 0 to 254.	TCP,UDP

Table 2-24 Parameters of l3l4_hash_config

Parameter	Description and Values	Default Value
ECMP-ROTATION	To specify hash rotation value that is used in ECMP binning. Values: 0, 1, and 2.	0
L4SRCPORT	To include L4 source port field in hash calculation. Values: true, false.	true
L4DSTPORT	To include L4 destination port field in hash calculation. Values: true, false.	true
SYMMETRIC-L3L4	To enable or disable symmetric hashing of L3 and L4 fields. These fields include source IP, destination IP, L4 source port and L4 destination port. Values: true, false.	true

Example

```
# l3l4_hash_config srcip true dstip true symmetric_l3l4 true
dscp_mask 0x3f protocolid true l4srcport true l4dstport true
l4_select tcp,udp
```

2.1.34 health_check_status**Syntax**

```
health_check_status type TYPE port PORT state STATE
```

Description

Use this command to set health check status of a link.

Table 2-25 Parameters of health_check_status

Parameter	Description and Values	Default Value
TYPE	Type of the health check parameter that need to be set. Supported value: link_state	N/A
PORT	The port for which the health check status is set. Supported value: Any of the VF ports	N/A
STATE	State of the health check notification. Supported value: up, down	N/A



Health check status takes more precedence over physical link status. However, it is required that both physical link status and health check status need to be synchronized.

Example

```
# health_check_status type link_state port swlp21.1 state up
```

2.1.35 show_health_check_status

Syntax

```
show_health_check_status
```

Description

Use this command to display the health check status of all the ports.

Example

```
# show_health_check_status
```


2.1.36 snapshot

Syntax

```
snapshot output <FILE> SAVE-OPTION
```

Description

Use this command to capture the snapshot of the running configuration of the Switch. This command is applicable only for PCIE-9202 card.

Table 2-26 Parameters of snapshot

Parameter	Description and Values	Default Value
FILE	File to which the configuration need to be saved.	N/A
SAVE-OPTION	disable: Not to save read-only configuration enable: To save read-only configuration also. In Switch software context, currently, there are no read-only configurations. All are read-write configurations.	N/A

Example

```
# snapshot output switch_conf.cfg enable
```

2.1.37 reload

Syntax

```
reload config <CONFIG>
```

Description

Use this command to reload an existing configuration file. The configuration file can be either default configuration or any of the snapshot files. This command is applicable only for PCIE-9202 card.

Table 2-27 Parameters of reload

Parameter	Description and Values	Default Value
CONFIG	<p>default: If "default" is given, the default configuration of the switch is loaded. That means, the configuration is reset to default.</p> <p>If a snapshot file is provided, then the configuration from that file is loaded. This file can be any of the snapshot files. Refer to section snapshot on page 49, to capture a snapshot.</p>	N/A

Example

To reset the configuration of the switch to default, use the following command.

```
# reload config default
```

To load an existing snapshot configuration file, use the following command. For example, to load `switch_conf.cfg` file,

```
# reload config switch_conf.cfg
```

2.1.38 lacp_system_priority**Syntax**

```
lacp_system_priority value PRIORITY
```

Description

Use this command to configure system priority that is used to frame system ID. LACP system ID is the combination of Router MAC address and System Priority.

Table 2-28 Parameters of lacp_system_priority

Parameter	Description and Values	Default Value
PRIORITY	The LACP system priority that is used in LACP system ID.	32768

Example

```
# configure terminal
# lacp_system_priority value 100
```

2.1.39 show_etherchannel

Syntax

```
show_etherchannel [group GROUPID [member PORT]] [include DETAIL]
```

Description

Use this command to display the specific configured LACP channel group on the switch. If no identifier is provided, the command displays all the configured LACP channel groups.

Table 2-29 Parameters of show_etherchannel

Parameter	Description and Values	Default Value
GROUP ID	LACP channel group identifier.	N/A
PORT	To show LACP member information.	N/A
DETAIL	To display detailed information about LACP channel group.	N/A

Example

```
# MaxCore(switch-1-1-11-1-1-0-1)#show_etherchannel group 20 include detail
```

```

Switch ID      : 1                ;LACP Group      : po20      ;
Group State    : DOWN            ;

System ID      : 028f.9dfa.0001;System Priority   : 32768     ;

Member         : swlp5           ;LACP port ID  : 5005     ;
Port LACP state: NO SYNC;

Port LACP priority: 32768        ;Port LACP interval : LONG      ;
Port LACP mode : ACTIVE ;

Partner System ID : NA          ;Partner System Priority: NA      ;

Partner ID       : NA           ;Partner priority    : NA        ;

Partner interval : NA           ;Partner key         : NA        ;

!

Switch ID      : 1                ;LACP Group      : po20      ;
Group State    : DOWN            ;

System ID      : 028f.9dfa.0001;System Priority   : 32768     ;

Member         : swlp8           ;LACP port ID  : 5008     ;
Port LACP state: NO SYNC;

Port LACP priority: 32768        ;Port LACP interval : LONG      ;
Port LACP mode : ACTIVE ;

Partner System ID : NA          ;Partner System Priority: NA      ;

Partner ID       : NA           ;Partner priority    : NA        ;

Partner interval : NA           ;Partner key         : NA        ;

!

```

2.2 VLAN Mode CLI

This section contains commands to create or delete VLANs on the switch.

2.2.1 vlan

Syntax

```

vlan id VLANID [description VLAN_NAME] [state STATE]
[intervlan_route INTERVLAN]

```

```
no_vlan vlan VLANID
```

Description

Use this command to create a VLAN, assign name, and to enable intervlan-routing on a VLAN. A VLAN state can be enabled or disabled. Disabling a VLAN will lead to deleting VLAN on the RRC hardware and thus switching is stopped on this VLAN.

To enable routing through a VLAN, use intervlan-route enable option while creating that VLAN.

Use **no** form of this command to delete the already configured VLAN.

Table 2-30 Parameters of vlan

Parameter	Description and Values	Default Values
VLANID	VLAN on which an operation is to be performed. Range: 2-4022.	N/A
VLAN_NAME	Alias string of the VLAN in readable format.	vlan<switchid>.<VLANID>
STATE	State of the VLAN being created. Possible values: enable, disable	enable
INTERVLAN	Possible values: enable, disable enable: Enables intervlan routing for this VLAN.	disable

Example

```
# vlan database
```

```
# vlan id 100 state enable intervlan_route enable
```



Management VLAN cannot be removed.

By default, the Management VLAN is 11. You can configure the Management VLAN to any value between the range 2-4022 in `/opt/switch_sw/etc/mgmt_network.conf` file.

2.3 Port CLI

This section describes L2 and L3 commands required to configure a port.

2.3.1 description

Syntax

```
description DESC_STRING
```

Description

Use this command to set the description of the port.

Table 2-31 Parameters of description

Parameter	Description and Values	Default Values
DESC_STRING	User-defined description of port. Maximum size of the string is 24. String can include alphabets, numbers, space, hyphen, underscore, and brackets (). If there are multiple words, enclose them in “” double quotes.	N/A

Example

```
# port sw1p1
```

```
# description "port 1"
```

2.3.2 mode

Syntax

```
mode type TYPE bandwidth BANDWIDTH
```

Description

Use this command to configure mode of a port. The speed or bandwidth of the port is set based on the selected mode. The ports of switch can be operated in either grouped or independent mode.

In grouped mode, a set of four independent ports are configured as one switch port. The possible group modes are 100GB-SR4 and 40GB-SR4.

In independent mode, each port can be configured with 25GB-SR, 10GB-SR, and 1000B-X modes.

Table 2-32 Parameters of mode

Parameter	Description and Values	Default Values
TYPE	Mode in which the port is to be configured. Values: group, independent	N/A
BANDWIDTH	Bandwidth of the port to be configured. Group Mode supports: 100GB-SR4 40GB-SR4 Independent Mode supports: 25GB-SR 10GB-SR 1000B-X	N/A

Example

```
# port sw1p1

# mode type group bandwidth 100GB-SR4
```



Mode cannot be configured on PCIe End Points (PEP), SA, and VLAN ports.
 Group mode is applicable only on sw1p1, sw1p5, and sw1p9 (in case of PCIE-9202) ports.

2.3.3 mtu

Syntax

```
mtu SIZE
```

Description

Use this command to set the Maximum Transmission Unit (MTU) size of a port.
 By default, MTU size of a port is 1536 bytes.

Table 2-33 Parameters of mtu

Parameter	Description and Values	Default Value
SIZE	Size of MTU on a port in bytes. Range: 68-9216.	1536

Example

```
# port sw1p1
# mtu 3000
```



MTU cannot be configured on PCIe End Points (PEP) ports.

2.3.4 mac_learning

Syntax

```
mac_learning (enable|disable)
```

Description

Use this command to enable or disable MAC learning. MAC learning configuration is per port level. By default, MAC learning is enabled. This command is valid for L2 port type and the valid ports are "physical" and "sa".

Example

```
# port sw1p1  
# mac_learning disable
```



Enabling MAC learning at port level would require MAC learning to be enabled at switch level.

2.3.5 shutdown

Syntax

```
shutdown  
no_shutdown
```

Description

Use this command to set the administrative state of a port to DOWN.

Use **no** form of this command to set the administrative state of the port to UP.

Example

```
# port sw1p1
```

```
# shutdown
```



In MaxCore environment, ports sw1p20 and sw1p24 are used for management. Administrative status disable is not allowed on these ports. Administrative status on PEP ports (sw1p20 to sw1p24) will not reflect in hardware due to hardware limitation.

2.3.6 static_channel_group

Syntax

```
static_channel_group GROUP-ID
```

```
no_static_channel_group group GROUP-ID
```

Description

Use this command to create a static aggregator, or add a member port to an already existing static aggregator.

Use **no** form of this command to detach the port from the static aggregator. If the port is the last one in the static aggregator, the static aggregator is also deleted.



Static channel group cannot be configured on PCIe End Points (PEP), SA, and VLAN ports.

Table 2-34 Parameters of static channel group

Parameter	Description and Values	Default Values
GROUP-ID	Static channel group identifier. Range: 1 – 16.	N/A

Example

```
# port sw1p1
```

```
# static_channel_group 1
```

2.3.7 switchport

Syntax

```
switchport
```

```
no_switchport
```

Description

Use this command to configure a port to L2 port. By default, all the ports of the switch are configured as switchport.

Use **no** form of the command to configure the port as L3 port.

Example

```
# port sw1p1
```

```
# switchport
```



The "switchport mode" commands are not applicable for L3 and VLAN ports.

2.3.8 switchport mode access

Syntax

```
switchport mode access [ingress_filter [enable|disable]]
```

Description

Use this command to set the mode of VLAN classification mode to access. In access mode, only untagged packets are accepted and switched on default VLAN. By default, the value of default VLAN is "1".

If `ingress_filter` is enabled, all the tagged packets are dropped. If `ingress_filter` is disabled, switch accepts all the untagged and tagged packets. If no option is specified, `ingress_filter` is enabled, by default.

Table 2-35 Parameters of switchport mode access

Parameter	Description and Values	Default Value
Ingress_filter [enable disable]	enable - All the tagged packets are dropped. disable - All the untagged and tagged packets are accepted.	enable

Example

```
# port sw1p1
# switchport mode access ingress_filter disable
```

2.3.9 switchport mode trunk

Syntax

```
switchport mode trunk [ingress_filter (enable|disable) ]
```

Description

Use this command to set VLAN classification mode to trunk. In trunk mode, tagged traffic is allowed on more than one VLAN. By default, untagged traffic is dropped and the port sends only tagged packets.

If `ingress_filter` is enabled, the port drops the untagged packets and accepts tagged traffic with configured VLANs. If `ingress_filter` is disabled, port accepts both tagged and untagged traffic. By default, `ingress_filter` is enabled, if no option is specified.

Table 2-36 Parameters of switchport mode trunk

Parameter	Description and Values	Default Values
Ingress_filter [enable disable]	enable: All the untagged packets are dropped and accepts tagged traffic with configured VLAN only. disable: Accepts untagged traffic and switched on native VLAN. This option is not recommended, because it also accepts all VLAN tagged traffic that is not configured on the port.	enable

Example

```
# port sw1p1
# switchport mode trunk ingress_filter enable
```



By default, Management VLAN is 11.

In MaxCore environment, Management port is sw1p20 when a PCIE-920x card is systemHost and Management ports are sw1p20, sw1p24 when a PCIE-920x card is not systemHost.

The Management ports are configured in trunk mode, with ingress filter disabled.

2.3.10 switchport mode hybrid

Syntax

```
switchport mode hybrid [ingress_filter (enable | disable)] |
[acceptable_frame_type (vlan_tagged | all)]
```

Description

Use this command to set VLAN classification mode to hybrid. Hybrid mode provides mechanism to accept and forward both untagged and tagged traffic on more than one VLAN. Both ingress and egress criteria can be specified.

If `ingress_filter` is enabled, all the tagged packets are dropped. If `ingress_filter` is disabled, switch accepts all the untagged and tagged packets with default VLAN. By default, `ingress_filter` is enabled, if not specified.

Table 2-37 Parameters of switchport mode hybrid

Parameter	Description and Values	Default Values
<code>acceptable_frame_type [vlan_tagged all]</code>	<p>vlan-tagged: To configure the port to receive tagged frames only.</p> <p>both: To configure the port to receive both tagged and untagged frames.</p>	all
<code>ingress_filter [enable disable]</code>	<p>enable: All the tagged packets for VLANs that are not configured are dropped.</p> <p>disable: All the untagged and tagged packets with default VLAN are accepted.</p>	enable

Example

```
# port sw1p1
# switchport mode hybrid
# switchport mode hybrid ingress_filter disable
```



vlan_add and vlan_remove commands cannot be executed when port is L3.

Hybrid mode cannot be configured on PEP ports.

2.3.11 vlan_add

Syntax

```
vlan_add vlan VLANID [native (true|false)][egress_tagged EGRESS_TAG]
```

Description

Use this command to add VLAN configuration on the port.

Table 2-38 Parameters of `vlan_add vlan`

Parameter	Description and Values	Default Values
VLANID	The VLAN that is added to the port.	N/A
EGRESS_TAG	This is valid only on Hybrid port. Possible values: enable, disable enable: Frames egressing out of the port on this VLAN will be tagged. disable: Frames egressing out of the port on this VLAN will be untagged.	enable
Native	true: Sets the VLAN as default/native VLAN on the port. With this configuration, untagged packets are switched based on the configured default VLAN. false: Adds VLAN as non-default or removes the VLAN as non-default.	false

Example

```
# port sw1p1
# vlan_add vlan 10
```

2.3.12 vlan_remove**Syntax**

```
vlan_remove vlan VLANID
```

Description

Use this command to delete VLAN configuration on the port.

Table 2-39 Parameters of `vlan_remove vlan`

Parameter	Description and Values	Default Values
VLANID	The VLAN ID that need to be removed.	N/A

Example

```
# port sw1p1
# vlan_remove vlan 10
```



Management VLAN cannot be disassociated on Management ports. By default, Management VLAN is 11. In MaxCore environment, Management port is sw1p20 when PCIE-920x card is systemHost and it is sw1p20, sw1p24 when a PCIE-920x card is not systemHost.

2.3.13 ip_address

Syntax

```
ip_address IP_ADDRESS
no_ip_address
```

Description

Use this command to set IPv4 address of a port.

Use **no** form of this command to remove IPv4 address from the port.

Physical ports of type L3 and VLAN are the valid ports for this command.

Table 2-40 Parameters of `ip_address`

Parameter	Description and Values	Default Values
IP-ADDRESS	IPv4 address and the prefix length of a port. The format should be ipv4 address/mask.	N/A

Example

```
# port sw1p1
# ip_address 10.10.10.1/24
```

2.3.14 mirror**Syntax**

```
mirror sourceport SOURCEPORT direction SNOOPDIRECTION [vlan VLANID]
no_mirror sourceport SOURCEPORT
```

Description

Use this command to start mirroring of the packets from one port to another port. This command also allows to select the direction of the packets that need to be mirrored.

Use **no** form of this command to stop mirroring of the packets.

Table 2-41 Parameters of `mirror interface`

Parameter	Description and Values	Default Values
SOURCEPORT	Name of the source port from which the packets need to be mirrored.	N/A
SNOOPDIRECTION	The direction of the packets that need to be mirrored to. Valid values: both, receive, and transmit.	N/A

Table 2-41 Parameters of mirror interface

Parameter	Description and Values	Default Values
VLANID	The VLAN that the switch uses for mirroring (for internal use). You do not need to create this VLAN on the switch. This does not affect VLAN switching. Usage: This is applicable only if destination port is VF. This VLAN should be configured on VF, only then traffic is mirrored to VF port.	1

Example

```
# port swlp20.2
# mirror sourceport swlp20.1 direction both
```



If source port is a VF port, you have to create a match list with a qualifier to match source port and provide action parameter as mirror destination port with key word `mirror_dest`.

Each configured VF source port should have a unique match list ID.

2.3.15 vlan_stacking

Syntax

```
vlan_stacking type TYPE [ethertype ETHERTYPE}
no_vlan_stacking
```

Description

Use this command to enable VLAN stacking and set switching characteristics of the Layer 2 interface to the configured type either to customer-edge-port or provider-port. If ethertype is not specified, the default value is 0x88a8.

Use **no** form of this command to disable VLAN stacking of the Layer 2 interface.

Table 2-42 Parameters of vlan_stacking type

Parameter	Description and Values	Default Values
TYPE	Type of port in vlan stacking configuration. Possible values: customer_edge_port or provider_port.	N/A
ETHERTYPE	Ethertype field for the vlan tag (in 0xhhhh hexadecimal notation).	0x88a8

Example

```
# port sw1p1
# vlan_stacking type customer_edge_port ethertype 0x88a8
```

2.3.16 error_threshold

Syntax

```
error_threshold type (crc | alignment | badsymbol) threshold
THRESHOLD [action shutdown | notify]
no_error_threshold type (crc | alignment | badsymbol)
```

Description

Use this command to configure thresholds for various types of errors.

Asynchronous events are sent when the configured threshold is hit in the interval for a specific error on a particular port. Asynchronous events are sent through XML interface, only if the error threshold is enabled through error-threshold enable command.

Shutdown action is optional and when `shutdown` option is specified, the port is shutdown apart from sending asynchronous events when the configured threshold is hit.

Table 2-43 Parameters of error_threshold type

Parameter	Description and Values	Default Values
THRESHOLD	Threshold value after which the configured action is performed. Range: 1-4294967295.	N/A

Example

```
# port sw1p1
# error_threshold type crc threshold 200 action shutdown
```

2.3.17 arp_ageing_time

Syntax

```
arp_ageing_time <AGEINGTIME>
```

```
no_mac_ageing_time
```

Description

Use this command to configure ageing-out time for the dynamic ARP entries. This command is valid for L3 and intervlan port.

Use **no** form of this command to set the arp-ageing-time to default.

Table 2-44 Parameters of arp_ageing_time

Parameter	Description and Values	Default Values
AGEINGTIME	Number of seconds after which the dynamic ARP addresses are aged out. Range: 60-3000 seconds	3000

Example

```
# port sw1p1
# arp_ageing_time 1000
```

2.3.18 channel_group

Syntax

```
channel_group group GROUP-ID mode MODE
no_channel_group group GROUP-ID
```

Description

Use this command to create a link aggregation (LAG) based on LACP, or add a member port to an already-existing LAG.

Use **no** form of this command to detach the port from the LAG. If the port is the last one in the LAG, the LAG is also deleted.

Table 2-45 Parameters of channel_group

Parameter	Description and Values	Default Values
GROUP-ID	LAG identifier. Range: 1 – 65535	N/A
MODE	Negotiating mode in which LAG member need to be configured with. Values: active, passive active: The mode in which the port initiates LACP negotiations. passive: The mode in which the port responds to LACP packets, but does not initiate the negotiation. Mode can be changed at run-time as well.	N/A

Example

```
# configure terminal
```

```
# port sw1p1
# channel_group group 1 mode active
```

2.3.19 lacp_timeout interval

Syntax

```
lacp_timeout interval INTERVAL
```

Description

Use this command to configure keep-alive timeout of LAG member.

Table 2-46 Parameters of lacp_timeout interval

Parameter	Description and Values	Default Values
INTERVAL	Interval at which LACP packets are exchanged. Values: short, long short: 1 second long: 30 seconds	Long

Example

```
# configure terminal
# port sw1p1
# channel_group group 1
# lacp_timeout interval short
```

2.3.20 lacp_port_priority

Syntax

```
lacp_port_priority value PRIORITY
```

Description

Use this command to configure port priority of the LACP member that is used to frame port identifier. This port priority is used to determine which of the member ports should be in standby mode. There is no such standby mode in current implementation.

Table 2-47 Parameters of lacp_timeout interval

Parameter	Description and Values	Default Values
INTERVAL	Port priority that is used for framing LACP port identifier.	32768

Example

```
# configure terminal
# port sw1p1
# channel_group group 1
# lacp_port_priority value 100
```

2.4 Load Balancing Pool CLI

Load Balancing Pool CLI commands are used to configure Server Load Balancing (SLB) parameters of pool and pool members.

2.4.1 pool

Syntax

```
pool POOL-ID
no_pool id POOL-ID
```

Description

Use this command to enter into Server Load Balancing (SLB) pool mode. If the pool does not exist, it is created before entering the pool mode. By default, the pool is in disabled state.

Use **no** form of this command to delete the pool configuration.

Table 2-48 Parameters of pool

Parameter	Description and Values	Default Values
POOL-ID	Pool identifier to configure. Range: 1-16.	N/A

Example

```
# lb database
# pool 1
```

2.4.1.1 description

Syntax

```
description DESC_STRING
```

Description

Use this command to set the description of the load balancing pool.

Table 2-49 Parameters of description

Parameter	Description and Values	Default Values
DESC_STRING	You can set the description for load balancing pool. Maximum size of the string is 24 characters. String can include alphabets, numbers, space, hyphen, underscore, or brackets ().	N/A

Example

```
# lb database
# pool 1
# description pool-1
```


2.4.1.2 destination ip_address

Syntax

```
destination ip_address DEST_PREFIX
```

```
no_destination [ip_address DEST_PREFIX]
```

Description

Use this command to configure destination IPv4 network or address of the traffic to be load balanced by the pool.

Use **no** form of this command to remove the specified configured destination IP address. The IPv4 destination address is optional when using this command. If no IP address is specified, this command removes all the configured destination IP addresses.

Table 2-50 Parameters of destination ip_address

Parameter	Description and Values	Default Values
DEST_PREFIX	IPv4 address of the pool traffic. The format should be ipv4 address/mask.	N/A

Example

```
# destination ip_address 10.10.10.1/32
```

```
# no_destination ip_address 10.10.11.0/24
```

2.4.1.3 member

Syntax

```
member ip_address IPADDR [state (enable | disable)][weight  
WEIGHT][id MEMBER-ID]
```

```
no_member id MEMBER_ID
```

Description

Use this command to associate a pool member to the pool and to configure IP address. When the pool member is being created, it is mandatory to specify its IP address. If no member id is specified, the pool member ID is generated automatically.

This command is also used to enable or disable the pool member and configure the weight of the pool member. By default, the pool member is in disabled state. By enabling the pool member, the pool member is ready for SLB based on the pool configuration.

Use **no** form of this command to dissociate the pool member from the pool and then delete the pool member.

Table 2-51 Parameters of member

Parameter	Description and Values	Default Values
MEMBER-ID	Pool member identifier. This is an optional parameter. Range: 1 – 512.	N/A
IPADDR	IP address of the pool member.	N/A
enable/disable	enable: Pool member is treated as ready for SLB. disable: Pool member is not ready for load balancing.	disable
WEIGHT	Weight of the pool member. This is used for calculating the Range: 1-10.	1

Example

```
# lb database

# pool 1

# member ip_address 1.1.1.1 id 1 state enable weight 1
```

2.4.1.4 state

Syntax

```
state (enable | disable)
```

Description

Use this command to enable the pool. By default, the pool is in disabled state. Though the pool is enabled, it is not effective on hardware unless a match-list is associated or a load balancing criteria is configured.

Disable state disables the pool. That means, the pool is not effective till it is enabled again.

Example

```
# lb database
# pool 1
# state enable
```

2.5 Match List CLI

This section contains match list commands to qualify traffic and to perform various actions on the matched packets.



If a match-list is created only with inports (*match_port*) and redirect_port action (*rule match_list*), port mask is created with high priority. Any other match-list on those ports, though created will be overridden by port mask. Port mask creates a virtual switching environment between the ingress and egress ports. That means, frames from the inport are forwarded only to the port that is specified in redirect-port.

2.5.1 table

Syntax

```
table TABLE_ID
```

Command mode

Configure

Description

Use this command to enter into table mode and configure match-list entries.

Table 2-52 Parameters of table

Parameter	Description and Values	Default Values
TABLE_ID	Table Identifier Range: 1 (TCAM0), 2 (TE)	N/A

Example

```
# configure terminal
# table 1
```

2.5.2 match_list

Syntax

```
match_list MATCH_LIST_ID
no_match_list id MATCH_LIST_ID
```

Command mode

Table

Description

Use this command to change the CLI mode to match-list mode. In this mode, various parameters can be specified to match the packets and rules can be applied on the traffic that flow through the switch.

Table 2-53 Parameters of match_list

Parameter	Description and Values	Default Values
MATCH_LIST_ID	Match list identifier. Range: 1-2048.	N/A

Example

```
# configure terminal
# table 1
# match_list 2
```

2.5.3 priority

Syntax

```
priority PRIORITY
no_priority
```

Command mode

Match-list

Description

Use this command to configure the priority of the rule within the match -list table.

Table 2-54 Parameters of priority

Parameter	Description and Values	Default Values
PRIORITY	Match_list priority. Higher the value, higher the priority of the match-list. Range: 0-65535.	0

Example

```
# configure terminal
# table 1
# match_list 2
# priority 2
```

2.5.4 match_l2param

Syntax

```
match_l2param {dstmac DSTMAC dstmask DSTMASK | ethertype ETHERVALUE
| innervlan INNERVLANID | srcmac SRCMAC srcmask SRCMASK | outervlan
OUTERVLANID}
```

Command mode

Match-list

Description

Use this command to specify L2 parameters that need to be matched. Use `match_l2param` to specify the L2 parameters and their values based on which the actions are applied to control the transmission of packets and update various contents in the packets.

Table 2-55 Parameters of match_l2param

Parameter	Description and Values
DSTMAC	To match destination MAC address. The MAC address format should be in the HHHH.HHHH.HHHH format.
DSTMASK	To mask out destination MAC address to match. Mask follows MAC address format, HHHH.HHHH.HHHH If no mask is provided, default mask is FFFF.FFFF.FFFF
INNERVLANID	To match inner vlan-id in double-tagged packets. This is useful when vlan-stacking is in use. Range: 2-4022.
ETHERVALUE	To match ethertype field of the packet. Note that the TPID should not to be matched against ethertype. Range: 0x0000 - 0xFFFF.
OUTERVLANID	To match VLAN-id in single-tagged packet. In case of double-tagged packet, it matches the outer vlan-id.
SRCMAC	To match Source MAC address. MAC address should be in the HHHH.HHHH.HHHH format.
SRCMASK	To mask out Source MAC address to match. Mask follows MAC address format HHHH.HHHH.HHHH If no mask is provided, default mask is FFFF.FFFF.FFFF

Example

```
# configure terminal
# table 1
# match_list 2
# match_l2param dstmac 0000.0000.1111 dstmask ffff.ffff.ffff
innervlan 10
```

2.5.5 match_l3param

Syntax

```
match_l3param {dstip DSTIPV4ADDR dstmask IPV4MASK | protocolid
PROTOID | srcip SRCIPV4ADDR srcmask IPV4MASK}
```

Command mode

Match-list

Description

Use this command to specify L3 parameters that need to be matched. This command allows you to specify the L3 parameters and their values based on which the actions are applied to control the transmission of packets and update various contents in the packets.

Table 2-56 Parameters of match_l3param

Parameter	Description and Values
DSTIPV4ADDR	To match destination IPv4 address.
IPV4MASK	To mask the value of corresponding IPv4 address. If no mask is provided, default mask is 255.255.255.255
PROTOID	To match Protocol-ID in the IPv4 header.
SRCIPV4ADDR	To match source IPv4 address.

Example

```
# configure terminal
```

```
# table 1

# match_list 2

# match_l3param dstip 10.10.10.10 dstmask 255.255.255.255
protocolid 6
```

2.5.6 match_l4param

Syntax

```
match_l4param {l4srcport SRCPORT l4srcmask MASK | l4dstport DSTPORT
l4dstmask MASK}
```

Command mode

Match_list

Description

Use this command to specify L4 parameters that are to be matched. It is required to configure L3 Protocol ID when configuring to match for L4 port parameters.

Using this command, you can specify the L4 parameters and their values based on which the actions are applied to control the transmission of packets and update various contents in the packets.

Table 2-57 Parameters of match_l4param

Parameter	Description and Values
DSTPORT	To match destination port number in L4 header. Range: 0-65535.
SRCPORT	To match source port number in L4 header. Range: 0-65535.
MASK	Mask need to be given in hexadecimal format. Range: 0x0000 - 0xFFFF. If no mask is provided, by default it is 0xFFFF.

Example

```
# configure terminal
# table 1
# match_list 2
# match_l4param l4dstport 100 l4srcport 200
# configure terminal
# table 1
# match_list 3
# match_l4param l4srcport 22 l4srcmask 0xFFFF l4dstport 5678
l4dstmask 0xFFFF
```

2.5.7 match_port

Syntax

```
match_port (inports PORT)
```

Command mode

Match-list

Description

Use this command to specify the input port on which the traffic needs to be qualified.

Example

```
# configure terminal
# table 1
# match_list 2
```

```
# match_port inports swlpl
```



Multiple inports are not supported due to hardware limitation.

2.5.8 rule match_list

Syntax

```
rule match_list MATCHLISTID {redirect_slb SLBPOOLID | redirect_port
REDIRECTPORT | drop DROP| modify_vlanid MOD-VLANID |
modify_pktpriority MOD-PKTPRIORITY | modify_dstmac MOD-DSTMAC |
modify_dscp MOD-DSCP | copytocpu CPU| modify_IntPriority MOD-
INTPRIORITY | modify_pktIntPriority MOD-PKTINTPRIORITY | count
COUNT| goto_table GOTOLISTID | pop_vlan POP_VLAN | push_vlan
PUSH_VLAN | redirect_lbg REDIRECT_LBG | mirror_dest MIRROR_DEST}

no_rule match_list MATCHLISTID
```

Command mode

Table

Description

Use this command to apply an action based on the specified match-list. This allows you to control the transmission of packets or to modify the packets, if a packet matches with the specified match-list. This command allows configuring multiple actions for a match-list.

Table 2-58 Parameters of rule match_list

Parameter	Description and Values
MATCHLISTID	Matchlist ID Range: 1-2048.

Table 2-58 Parameters of rule match_list (continued)

Parameter	Description and Values
SLBPOOLID	To redirect matched packets to server load balancing (ECMP) pool-id. Range: 1 -16. This configuration is not effective in hardware unless the selected pool id is in enable state.
REDIRECTPORT	To redirect the matched packets to port irrespective of the VLAN settings. Values: physical, SA, PO ports, and virtual functions. Multiple redirect_port ports are not supported due to hardware limitation. If input is a VF port, you have to provide one more action parameter.
DROP	To configure if the matched packets are to be dropped. Values: true, false
MOD-VLANID	To modify VLAN-tag in the matched VLAN-tagged packets. Range: 2-4022.
MOD-PKTPRIORITY	To modify priority in the 802.1Q tag header. Range: 0-7.
MOD-DSTMAC	To modify destination MAC address in the matched packets. This is not supported in this release.
MOD-DSCP	To modify DSCP field in the IP header. Range: 0-63.
CPU	To forward the matched packets to the CPU port. Values: true, false
MOD-INTPRIORITY	To direct the matched packets to a priority queue of the switch. This does not modify priority field in the 802.1Q tag header. Range: 0-7.
MOD-PKTINTPRIORITY	To modify priority in 802.1Q tag header and to direct the matched packets to a priority queue of the switch. Range: 0-7.
COUNT	To count the matched packets against the match-list. Values: true, false
GOTOLISTID	To match flow against a Match-list in a different table. It is a string of "table-id/match-list id". The referenced match-list should be existing, else an error is thrown. This is not supported in this release.

Table 2-58 Parameters of rule match_list (continued)

Parameter	Description and Values
POP_VLAN	To pop inner and outer VLAN headers. This parameter should be clubbed with modify_vlanid, due to hardware limitation. Values: true, false
PUSH_VLAN	To push an inner or an outer VLAN header. Values: true, false
REDIRECT_LBG	To redirect packet to the specified load balancing group. If the LBG does not exist, the same will be created in INIT state. However, the LBG is not effective, until members are added and set to active. Range: 1 - 16.
MIRROR_DEST	To mirror packets to VF or physical port. This action is valid only if match_port parameter is configured. It is applicable for match_port params for VF port only. Valid inputs are physical and VF ports. To configure this action, mirror should be configured before match list. Value: interface name.



Modify DSCP and Modify VLAN cannot coexist in the same match-list due to hardware limitation.



If no other action or match condition is clubbed with match_port inports and action redirect_port, port mask feature is enabled, which makes the ports exchange traffic only among themselves. To enable a matchlist to override this feature for the same combination, it need to be combined with another action or qualifier. For example, in order to redirect traffic to a VF from another port, you may include action like count.

Port mask feature is not supported for po and sa ports.

Example

```
# configure terminal
# rule match_list 2 redirect_slb 1
```

```
# rule match_list 3 modify_vlanid 10 modify_dscp 30
```

2.5.9 state

Syntax

```
state enable STATE match_list MATCHLISTID
```

Command mode

Table

Description

Use this command to set the state of matchlist entry to enable or disable. A matchlist entry cannot be updated when it is enabled. You have to disable the matchlist entry to modify it and enable it after modification.

Table 2-59 Parameters of state

Parameter	Description and Values	Default Values
STATE	Matchlist state. When set to true, the matchlist entry is enabled and when set to false it is disabled and then be modified. In enabled state, match list is active to apply action on the incoming matched flow. Values: true, false	N/A
MATCHLISTID	Matchlist entry Identifier for which the state is to be modified.	N/A

Example

```
# configure terminal
# table 1
# state enable true match_list 10
```

2.6 Load Balancing Group CLI

Load Balancing Group CLI commands are used to configure traffic load balancing parameters to a set of physical ports or virtual functions.

2.6.1 lbg

Syntax

```
lbg LBGID
```

```
no_lbg id LBGID
```

Command mode

LB

Description

Use this command to create a load balancing group and change the CLI mode to LBG. If the specified LBG already exists, only the CLI mode is changed to LBG.

Use **no** form of this command to delete an existing LBG.

Table 2-60 Parameters of LBG

Parameter	Description and Values	Default Values
LBGID	Identifier to uniquely identify a Load Balancing Group. Range: 1-16.	N/A

Example

```
# configure terminal
# lb database
# lbg 1
```

2.6.2 member

Syntax

```
member port PORTLIST
```

```
no_member port PORTLIST
```

Command mode

LBG

Description

Using this command, you can configure a list of member ports to an LBG. By default, all the ports are configured as active, unless specified using `lbg_backup` command. All the active member ports participate in load balancing.

Use **no** form of this command to remove port(s) from the LBG.



This command cannot be configured, if the LBG is in ENABLED state.

Table 2-61 Parameters of member

Parameter	Description and Values	Default Values
PORTLIST	The list of ports that are to be configured as member ports of an LBG. In the command usage, the port names must be separated with commas.	N/A

Example

```
# configure terminal

# lb database

# lbg 1
```

```
#member port sw1p20.1,sw1p20.2,sw1p2,sw1p3
```

2.6.3 port_weight

Syntax

```
port_weight weight WEIGHT ports PORTLIST
```

Command mode

LBG

Description

Use this command to configure weights of the member ports in an LBG. LBG members are distributed across buckets/bins based on the configured weights. This distribution of bins would effect the traffic load-balancing to each of the member ports.



By default, all the ports are configured with weight 1.

This command cannot be configured, if the LBG is in ENABLED state.



LBG members are distributed across the buckets/bins based on weight configuration. However, traffic is mapped to buckets based on the hash algorithm of hardware, thus the traffic distribution may not be in the exact ratio of configured weights.

Table 2-62 Parameters of port_weight

Parameter	Description and Values	Default Values
WEIGHT	The weight that need to be configured for the list of the ports.	N/A
PORTLIST	The list of ports to be configured with the specified weight. Port names must be separated by commas.	N/A

Example

```
# configure terminal
# lb database
# lbg 1
# member port swlp20.1,swlp20.2,swlp2,swlp3
# port_weight weight 2 ports swlp20.1,swlp20.2,swlp2
```

2.6.4 lbg_switchover_list

Syntax

```
lbg_switchover_list on_inactive PORT port_list SWITCHOVERLIST
```

Command mode

LBG

Description

Use this command to configure the list of ports to which the traffic need to be distributed in case when an active port goes down. This list of ports is called Switchover list. The ports mentioned here should have already been configured as member ports of the LBG.



By default, none of the ports act as switchover ports. This switchover port list need to be explicitly configured.

This command cannot be configured, if the LBG is in ENABLED state.

Table 2-63 Parameters of lbg_switchover_list

Parameter	Description and Values	Default Values
PORT	The port for which switchover list is being configured.	N/A

Table 2-63 Parameters of `lbg_switchover_list`

Parameter	Description and Values	Default Values
SWITCHOVERLIST	<p>The list of ports that need to share the traffic in case PORT goes down. Port names must be separated by commas.</p> <p>Predefined keywords “all” and “none” are also supported.</p> <p>all: Traffic will be load balanced to all the active ports of LBG.</p> <p>none: To configure none of the ports for switchover. In this case, if an active port goes down, the traffic distributed to that port will be dropped.</p>	N/A

Example

```
# configure terminal
# lb database
# lbg 1
# lbg_switchover_list on_inactive swlp20.1 list
swlp20.1,swlp20.2,swlp2
```

Example

```
# configure terminal
# lb database
# lbg 1
# lbg_switchover_list on_inactive swlp20.1 list all
```

2.6.5 lbg_backup

Syntax

```
lbg_backup port_list BACKUPLIST
```

Command mode

LBG

Description

Use this command to configure the list of backup ports to the LBG. Backup ports do not participate in load balancing until an active port goes down. When an active port goes down, one of the backup ports will take over the traffic that is directed to that active port. The ports mentioned here should have already been configured as member ports of the LBG.



If backup port list is empty, only then the traffic is load balanced to Switchover list.

This command cannot be configured, if the LBG is in ENABLED state.

Table 2-64 Parameters of lbg_backup

Parameter	Description and Values	Default Values
BACKUPLIST	<p>The list of ports that act as backup to active ports. Backup ports participate in load balancing only if any of the active ports go down.</p> <p>Port names must be separated by commas.</p> <p>Predefined keyword “none” is also supported.</p> <p>none: To configure none of the ports as backup. In this case, if an active port goes down, traffic is distributed to the ports in switchover list. If switchover list is empty, then the traffic associated to that active port will be dropped.</p>	N/A

Example

```
# configure terminal
# lb database
# lbg 1
# lbg_backup port_list sw1p21.1,sw1p21.2
```

2.6.6 lbg_mode

Syntax

```
lbg_mode mode MODE
```

Command mode

LBG

Description

Use this command to configure the mode of an LBG. The supported configuration modes are preemptive and non-preemptive. Based on the configured mode, the ports will assume roles when they are operationally up. If mode is not configured for an LBG, by default, it assumes preemptive mode.



This command cannot be configured, if the LBG is in ENABLED state. Currently, only Preemptive mode is supported.

Table 2-65 Parameters of lbg_mode

Parameter	Description and Values	Default Values
MODE	<p>Preemptive: If an active port goes down and comes up, then it assumes its active role and bins are remapped to the port. If a backup port goes down and comes up and if any of the active ports of the LBG is down, then the backup port assumes an active role, otherwise it assumes a backup role.</p> <p>Non-preemptive: Bins are not remapped. Irrespective of the active or backup role, the port acts as a backup for the LBG.</p>	N/A

Example

```
# configure terminal
```

```
# lb database
# lbg 1
# lbg_mode mode preemptive
```

2.6.7 state

Syntax

```
state STATE
```

Command mode

LBG

Description

Use this command to enable or disable an LBG. It is required that the LBG should be disabled, before changing LBG configuration. LBG will be installed on hardware, only if it is enabled explicitly and also if a matchlist is associated to the LBG.

Table 2-66 Parameters of state

Parameter	Description and Values	Default Values
STATE	<p>Enable: To activate an LBG. Once enabled, even if one of the active ports is up and running and a matchlist is associated, LBG is installed on hardware.</p> <p>Disable: To deactivate an LBG. If an LBG is already installed on hardware, it is uninstalled.</p>	N/A

Example

```
# configure terminal
# lb database
# lbg 1
```

```
# state enable
```

Related Documentation

A.1 Artesyn Embedded Technologies - Embedded Computing Documentation

The publications listed below are referenced in this manual. You can obtain electronic copies of Artesyn Embedded Technologies - Embedded Computing publications by contacting your local Artesyn sales office. For released products, you can also visit our Web site for the latest copies of our product documentation.

1. Go to www.artesyn.com/computing/support/product/technical-documentation.php.
2. Under **FILTER OPTIONS**, click the **Document types** drop-down list box to select the type of document you are looking for.
3. In the **Search** text box, type the product or document name and click **Filter**.

Table A-1 Artesyn Embedded Technologies - Embedded Computing Publications

Document Title	Publication Number
SSF for MaxCore™ MC3000 Platform XML Interface Guide	6806800T71
SSF for MaxCore™ MC3000 Platform Installation and Use	6806800T81
SharpSwitch PCIE-9205 Installation and Use	6806800U18



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