
Switch Software for PCIE-9205

CLI Guide

P/N: 6806800T85P

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About this Manual

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 card.

This manual contains the following chapters and appendices:

[Chapter 1, Introduction on page 25](#) provides a brief description about Switch Software and a procedure on how to access CLI.

[Chapter 1, CLI Commands on page 25](#) describes the list of CLI commands supported by Switch Software.

[Appendix A, Related Documentation on page 37](#) 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 |
|  | Indicates a hazardous situation which, if not avoided, could result in death or serious injury |
|  | Indicates a hazardous situation which, if not avoided, may result in minor or moderate injury |

| Notation | Description |
|---|---|
|  | Indicates a property damage message |
|  | No danger encountered. Pay attention to important information |

Summary of Changes

This manual has been revised and replaces all prior editions.

| Part Number | Publication Date | Description |
|-------------|------------------|--|
| 6806800T85P | January 2020 | Rebranded to SMART EC template. |
| 6806800T85O | October 2018 | Updated to new Artesyn template. Edited for SharpNIC™ card. |
| 6806800T85N | January 2018 | Updated mirror on page 56 . |
| 6806800T85M | September 2017 | Updated show_port on page 34 , show_switch on page 37 , show_mac_table on page 39 show_rule_match_list on page 42 , show_etherchannel on page 51 , and channel_group on page 66 . |
| 6806800T85L | August 2017 | Added lacp_system_priority on page 42 , channel_group on page 59 , lacp_timeout interval on page 60 , lacp_port_priority on page 60 , and show_etherchannel on page 43 commands. Updated log level on page 22 , show_port on page 24 , show_mac_table on page 29 , show_rule_match_list on page 32 , match_port on page 71 , and rule match_list on page 71 commands. |
| 6806800T85K | July 2017 | Added Figure PCIE-9205 Port Map on page 9 and Figure PCIE-9202 Port Map on page 10 . Updated Chapter 1, Introduction , Chapter 2, CLI Commands (updated all commands). Added snapshot on page 41 and reload on page 41 commands. |

| Part Number | Publication Date | Description |
|-------------|------------------|--|
| 6806800T85J | July 2017 | Added <i>PCIE-920x Cards Port Mapping on page 9</i> . Updated <i>Chapter 2, CLI Commands</i> . |
| 6806800T85H | April 2017 | Added new sections <i>health_check_status on page 40</i> , <i>show_health_check_status on page 40</i> , and <i>Load Balancing Group CLI on page 75</i> . Updated the sections <i>mac_learning on page 47</i> , <i>mirror on page 55</i> , <i>match_port on page 71</i> , <i>rule_match_list on page 71</i> , <i>show_lbg_distribution on page 35</i> , and <i>state on page 74</i> . |
| 6806800T85G | March 2017 | Added a note in the section <i>rule_match_list on page 71</i> . |
| 6806800T85F | January 2017 | Added a new command <i>l3l4_hash_config on page 38</i> and a note in the section <i>mac_learning on page 47</i> . Added a new command <i>state on page 74</i> . |
| 6806800T85E | October 2016 | Updated <i>Chapter 1, Introduction on page 9</i> . Updated the sections <i>vlan on page 44</i> , <i>switchport mode trunk on page 50</i> , <i>vlan_remove on page 54</i> , <i>show_match_list_pending on page 32</i> , <i>member on page 76</i> , <i>match_l2param on page 67</i> , <i>match_l3param on page 69</i> , and <i>match_l4param on page 70</i> . |
| 6806800T85D | August 2016 | Updated <i>vlan on page 44</i> , <i>mode on page 46</i> , <i>static_channel_group on page 48</i> , <i>shutdown on page 48</i> , <i>switchport on page 49</i> , <i>switchport mode trunk on page 50</i> , <i>switchport mode hybrid on page 51</i> , <i>vlan_remove on page 54</i> , and <i>ip_address on page 54</i> commands. |
| 6806800T85C | June 2016 | Updated <i>show_port on page 24</i> , <i>show_pool_member on page 23</i> , <i>description on page 45</i> , <i>pool on page 61</i> , <i>port on page 17</i> , <i>static_channel_group on page 48</i> , <i>clear_counters on page 21</i> , <i>show_mac_table on page 29</i> , <i>mode on page 46</i> , <i>mtu on page 47</i> , <i>switchport on page 49</i> , <i>match_list on page 66</i> , <i>priority on page 66</i> , <i>rule_match_list on page 71</i> , <i>match_l2param on page 67</i> , <i>match_l3param on page 69</i> , and <i>match_l4param on page 70</i> , and <i>match_port on page 71</i> commands. |

| Part Number | Publication Date | Description |
|-------------|------------------|--|
| 6806800T85B | April 2016 | <p>Added CLI commands arp_ageing_time on page 58, flush mac on page 33, flush arp on page 37, dump on page 37 and l3l4_hash_config on page 38.</p> <p>Updated CLI commands vlan on page 44, destination ip_address on page 73, member on page 76 and commands in Match List CLI section.</p> <p>Updated Chapter 1, Introduction on page 9, trademarks section, and rebranded the header image.</p> |
| 6806800T85A | January 2016 | Initial version |

Introduction

1.1 Overview

Switch Software provides the configuration and management interface for the PCIE-9205 card to carry out static routing, match-lists, trunk load balancing, load balancing group, and server load balancing.

1.2 PCIE-9205 Card Port Mapping

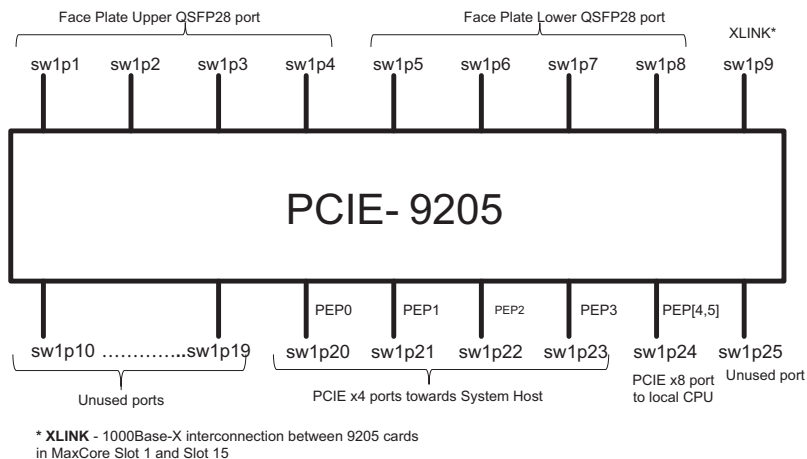
The RRC switch on the PCIE-9205 consists of nine PCIe End Points (PEPs) numbered as 0-8.

- 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

The CPP is the on-board CPU for the PCIE-9205.

The following diagrams show the switch connectivity of the PCIE-9205 card.

Figure 1-1 PCIE-9205 Port Map



1.3 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 |
| "?" 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. |

1.3.1 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 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)#
```

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.

CLI Commands

2.1 Introduction

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

2.2 Switch Mode CLI

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

2.2.1 mac_ageing_time

Syntax

```
mac_ageing_time <AGEINGTIME>
no_mac_ageing_time
```

Description

Use this command to configure aging-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
```

2.2.2 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
```

2.2.3 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
```

2.2.4 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
```

2.2.5 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 | Name of the port Range: Physical Ports, InterVLAN ports, and Static channel ports. For more information about Physical ports, refer to the section PCIE-9205 Card Port Mapping on page 15 . | N/A |

vlan database

Table 2-4 Parameters of port (continued)

| Parameter | Description and Values | Default Values |
|-----------|---|----------------|
| | <p>InterVLAN ports: Naming convention of InterVLAN ports should be in this format. <i>vlan</i><SWITCHID>.<VLANID> 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</i><GROUPEID> To create a Static channel port, see section static_channel_group</p> | |

Example

```
# port sw1p1
```

2.2.6 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
```

2.2.7 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
```

2.2.8 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
```

2.2.9 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
```


2.2.10 Ib 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
```

2.2.11 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 needs 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
```

log level

2.2.12 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
```

2.2.13 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: ;
```

2.2.14 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 |
| POOL MEMEBER 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;
!
```

show_port

```
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;
```

2.2.15 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: vf 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;

```

2.2.16 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;

```

show_running_config

2.2.17 show_running_config

Syntax

```
show_running_config
```

Description

Use this command to display the running configuration of the Intel® FM10840.

Example

```
# show_running_config
```

2.2.18 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
```

2.2.19 show_switch

Syntax

```
show_switch
```

Description

Use this command to display all 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;

```

2.2.20 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;

```

2.2.21 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;
```

2.2.22 show_mac_table

Syntax

```
show_mac_table
```

Description

Use this command to display the MAC table on the node. The show_mac_table also lists the MAC addresses of VFs created on the PEP.

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     ;!
```

2.2.23 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;
```

show_error_threshold

```
Gateway Name: sw1p1;  
Gateway Type: CONNECTED;
```

2.2.24 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;
```

2.2.25 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
```

2.2.26 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 |

flush mac

Table 2-17 Parameters of show_rule_match_list (continued)

| Parameter | Description and Values | Default Values |
|-----------|--|----------------|
| 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
```

2.2.27 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
```

2.2.28 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: swlp1, swlp2, swlp3, swlp4, swlp5, swlp6, swlp7, swlp8;
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;
```

show_lbg_distribution

```
BackupTo: ;      Switchover list: ;
Member: swlp6; State: Down;
BackupTo: ;      Switchover list: ;
Member: swlp7; State: Down;
BackupTo: ;      Switchover list: ;
Member: swlp8; State: Down;
BackupTo: ;      Switchover list: ;
```

2.2.29 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: swlp1,swlp2,swlp3,swlp4;
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;
```

!

flush arp

2.2.30 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
```

2.2.31 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 |

2.2.32 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 | /opt/switch_sw/etc/switch_config.conf |



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

2.2.33 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 |

l3l4_hash_config

Table 2-24 Parameters of l3l4_hash_config (continued)

| Parameter | Description and Values | Default Value |
|----------------|---|---------------|
| 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 |
| 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
```

2.2.34 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
```

2.2.35 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
```

2.2.36 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 2-26 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
```

2.2.37 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 2-27 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      ;
!
```

2.3 VLAN Mode CLI

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

2.3.1 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 leads 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 2-28 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.

2.4 Port CLI

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

2.4.1 description

Syntax

```
description DESC_STRING
```

Description

Use this command to set the description of the port.

Table 2-29 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"
```

2.4.2 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 2-30 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 ports.**

2.4.3 mtu

Syntax

```
mtu SIZE
```

Description

Use this command to set the Maximum Transmission Unit (MTU) size of a port. MTU cannot be configured on PCIe End Points (PEP) ports.

By default, MTU size of a port is 1536 bytes.

Table 2-31 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
```

2.4.4 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.

shutdown

2.4.5 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.

2.4.6 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 (SA), 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.

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

Table 2-32 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
```

2.4.7 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
```

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

2.4.8 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.

switchport mode trunk

Table 2-33 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 swlp1
# switchport mode access ingress_filter disable
```

2.4.9 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 2-34 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.



2.4.10 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 2-35 Parameters of switchport mode hybrid

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

vlan_add

Example

```
# port swlp1
# 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.

2.4.11 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 2-36 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 swlp1
# vlan_add vlan 10
```

2.4.12 vlan_remove

Syntax

```
vlan_remove vlan VLANID
```

Description

Use this command to delete VLAN configuration on the port.

Table 2-37 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.

2.4.13 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 2-38 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 swlp1
# ip_address 10.10.10.1/24
```

2.4.14 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 2-39 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 |
| 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.

2.4.15 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 2-40 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
```

2.4.16 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.

arp_ageing_time

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 2-41 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
```

2.4.17 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 2-42 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
```

2.4.18 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 2-43 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
```

lacp_timeout interval

2.4.19 lacp_timeout interval

Syntax

```
lacp_timeout interval INTERVAL
```

Description

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

Table 2-44 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 swlpl
# channel_group group 1
# lacp_timeout interval short
```

2.4.20 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 2-45 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
```

2.5 Load Balancing Pool CLI

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

2.5.1 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 2-46 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
```

2.5.1.1 description

Syntax

```
description DESC_STRING
```

Description

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

Table 2-47 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
```

2.5.1.2 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 2-48 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
```

2.5.1.3 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 2-49 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
```

2.5.1.4 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
```


2.6 Match List CLI



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`.

2.6.1 table

Syntax

```
table TABLE_ID
```

Command mode

Configure

Description

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

Table 2-50 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
```

2.6.2 match_list

Syntax

```
match_list MATCH_LIST_ID
```

```
no_match_list id MATCH_LIST_ID
```

Command mode

Table

priority

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 2-51 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
```

2.6.3 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 2-52 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
```

2.6.4 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 2-53 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. |

match_l3param

Table 2-53 Parameters of match_l2param (continued)

| Parameter | Description and Values |
|-----------|---|
| 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
fff.fff.fff innervlan 10
```

2.6.5 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 2-54 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
```

2.6.6 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 2-55 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_port

```
# 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
```

2.6.7 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. Multiple inports are not supported due to hardware limitation.

Example

```
# configure terminal
# table 1
# match_list 2
# match_port inports sw1p1
```

2.6.8 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 2-56 Parameters of rule match_list

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

rule match_list

Table 2-56 Parameters of rule match_list (continued)

| Parameter | Description and Values |
|--------------------|--|
| 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. |
| 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
```

2.6.9 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 2-57 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 |

Load Balancing Group CLI

Example

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

2.7 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.

2.7.1 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 2-58 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
```

2.7.2 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.

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

Example

```
# configure terminal
# lb database
# lbg 1
# member port sw1p20.1,sw1p20.2,sw1p2,sw1p3
```

2.7.3 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.

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

lbg_switchover_list



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.

Example

```
# configure terminal
# lb database
# lbg 1
# member port sw1p20.1,sw1p20.2,sw1p2,sw1p3
# port_weight weight 2 ports sw1p20.1,sw1p20.2,sw1p2
```

2.7.4 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 needs to be distributed in the event 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.

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

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

Table 2-59 Parameters of lbg_switchover_list

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

Table 2-59 Parameters of lbg_switchover_list (continued)

| Parameter | Description and Values | Default Values |
|----------------|--|----------------|
| SWITCHOVERLIST | The list of ports that need to share the traffic in case PORT goes down. Port names must be separated by commas. Predefined keywords “all” and “none” are also supported all : Traffic will be load balanced to all the active ports of LBG 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. | 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
```

2.7.5 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.**

Example

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

2.7.6 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.

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

Table 2-60 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
```

2.7.7 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 2-61 Parameters of state

| Parameter | Description and Values | Default Values |
|-----------|---|----------------|
| STATE | 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 Disable: To deactivate an LBG If an LBG is already installed on hardware, it is uninstalled | N/A |

Example

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


Related Documentation

A.1 SMART Embedded Computing Documentation

The documentation listed is referenced in this manual. Technical documentation can be found by using the Documentation Search at <https://www.smartembedded.com/ec/support/> or you can obtain electronic copies of SMART EC documentation by contacting your local sales representative.

Table A-1 SMART 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 |
| Openflow Switch Software for SharpNIC PCIE-9205 | 6806800U20 |
| SharpNIC™ PCIE-9205 Installation and Use | 6806800U18 |

