Qualcomm Technologies, Inc.

IPQ807x/IPQ807xA/IPQ817x PPE Switch Software Development Kit

User Guide

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Revision history

Revision	Date	Description
A	October 2017	Initial release
B	December 2017	Updated QoS.
C	February 2018	Updated FDB.
D	August 2018	Updated Port control in Architecture and Port control in Shell. ■ Added promiscmode.
E	October 2018	Updated Port control in Architecture and Port control in Shell. ■ Added eee configuration properties.
F	December 2018	■ Updated the usage for port interfacemode set in Port control.
G	March 2019	Updated all instances of IPQ807x to IPQ807x/IPQ807xA/IPQ817x in this document.
H	June 2019	Deleted the IGMP/MLD, Leaky and Misc commands in Shell.
J	February 2021	Updated Policer and Policer.
K	May 2022	Editorial changes: no technical changes are made.

Contents

1 Overview

The Switch Software Development Kit (SSDK) is a set of drivers to manage QTI (Qualcomm® Technologies, Inc.) switch. It can be the foundation for customer's application to control the behaviors of the switch or as a reference to build the customer's own low-level drivers.

The goals of the design are listed below.

1.1 Modularity and Hierarchy

The SSDK is based on a multi-layer architecture in which every layer has its own targets. This architecture ensures the SSDK can scale from small low-end system to future large multi-CPU and distributed system. Customers can select whether to include every layer into their own applications or not to simply change the build options to meet their own requirements.

The SSDK can be partitioned into the separate function modules, so that they can only attach the required functions into their systems to archive the small-footprint implementations for the cost sensitive systems.

1.2 Flexibility

Some UNIX-like operation systems are runing in the operation of CPU which is divided into two distinct modes: Kernel mode and User mode. Main modules of the SSDK can be executed in the kernel space or the user space by changing the related option on building. In this way, the SSDK can meet the different requirements of the customers' various systems.

1.3 Hardware abstraction

The SSDK abstracts all hardware details of Qualcomm Technologies switch line by providing the consistent APIs. Customers do not have to understand the implementation and register details and can easily use APIs to build their own applications.

1.4 Portability

The SSDK is built upon a System Abstraction Layer (SAL). SAL abstracts the difference between the various Operating Systems (OS) and CPU architectures and is easily to be ported to a new OS or CPU system. This can be achieved by adhering OS and Board Support Package (BSP) functions to some elaborated SAL APIs.

1.5 Robustness and Reliability

The SSDK ensures its production-quality from design phase to release phase. In addition, the SSDK handles the possible error states and returns a well-defined error code to reduce instability.

2 Architecture

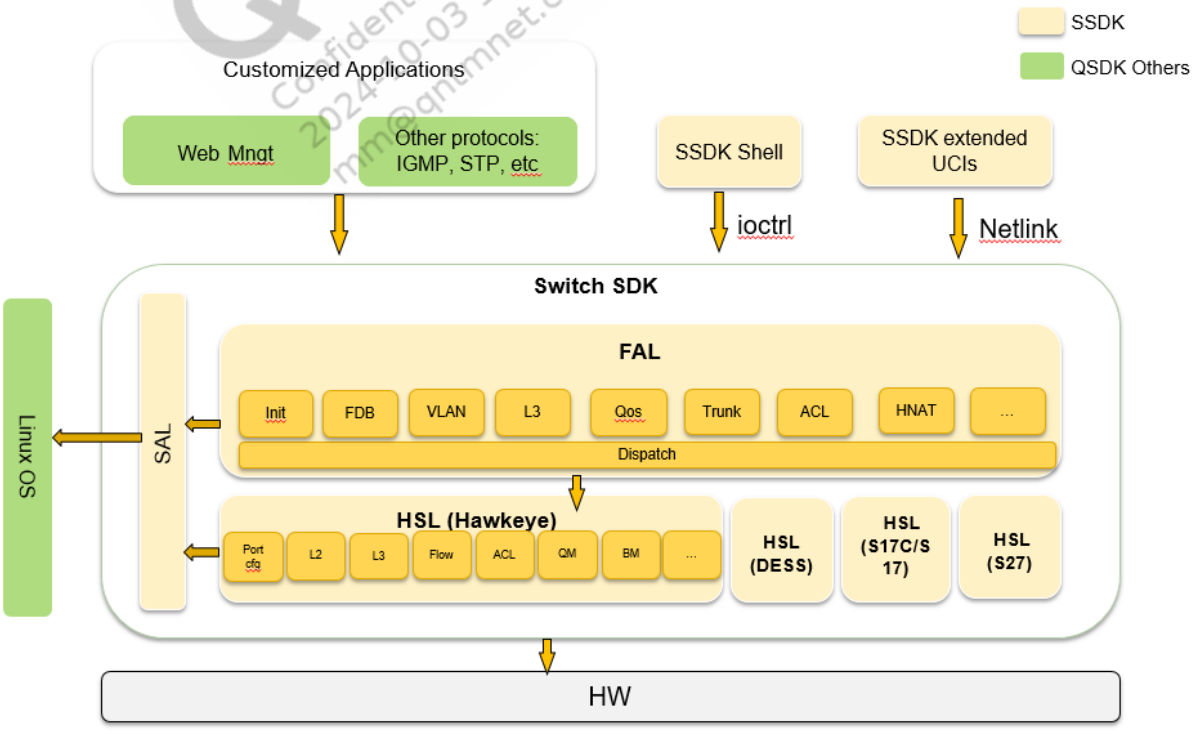
This chapter gives an overview of the SSDK software architecture and supporting features.

2.1 Basic software architecture

The SSDK can be divided into three layers: FAL, HSL and SAL.

- Function Abstraction Layer (FAL) abstracts the implement details of Qualcomm Technologies switch chIPSby providing consistent Function APIs (FAPIs) to customers.
- Hardware Specific Layer (HSL) provides Hardware APIs (HAPIs) to implement functions of specific chip.
- System Abstraction Layer (SAL) consists of OS abstraction APIs (OSAPI) and System Driver APIs (SDAPI), and are used to abstract the OS and CPU system. In addition, the SSDK includes a CLI-like simple shell to manage the switch and to provide a usage reference of the SSDK.

The basic software architecture can be illustrated in the below figure.



FAL is designed for providing unified APIs for Qualcomm Technologies switch line to user applications such as CLI, web and other protocols (IGMP snooping, DHCP relay and so on). User applications can

be built through the well-defined APIs without the deep understanding of internal implementation and register details. When porting a system from one chip to another, user applications can be built with the slightly changes because FAL abstracts the differences among Qualcomm Technologies switch products.

HSL is targeted for providing a set of APIs for specific Qualcomm Technologies switch chip, including HPPE, the name of the switch core for IPQ807x/IPQ807xA/IPQ817x. HSL knows the internal structure of the switch and modifies the related registers directly by invoking SDAPIs in the SAL layer. User applications can invoke APIs provided by HSL directly as well. As the result, the SSDK can serve with impressive small foot-print by simply choosing the related build options.

SAL consists of OS abstraction APIs (OSAPI) and System Driver APIs (SDAPI) and exists for the portability. OSAPIs provide the basic APIs, such as memory, timer and so on to abstract the differences among the common OSs as Linux, xBSD and VxWorks. SDAPIs abstract the details of the specific hardware platform by providing MDIO and future possible PCI functions for register access. By this mean, although the SSDK provides the support for Linux only, the efforts of porting to a new OS and hardware platform can be limited to this layer at this time.

The SSDK includes a simple CLI-like SHELL on Linux, which can be referenced as an example for user applications, to expedite experience of Qualcomm Technologies switch.

2.2 Basic software features

The features of FAL layer are described below, since APIs of HSL can be a subset of those of FAL in the most cases.

Usually APIs in the same feature set are collected to a file with a meaningful suffix as fal_acl, fal_fdb, fal_mib, fal_mirror, fal_port_ctrl, fal_portvlan, fal_vlan, fal_qos, fal_policer, fal_shaper, fal_stp, fal_qm, fal_bm, fal_ip, fal_flow, fal_trunk, fal_ctrlpkt, fal_servcode, fal_pppoe, fal_sec, and fal_rsshash.

2.2.1 Port control

Port control provides APIs for related port control operations. It supports the following functions:

- Set and get port Tx control status
- Set and get port Rx control status
- Set and get port Tx flow control status
- Set and get port Rx flow control status
- Set and get port flow control status
- Set and get port MTU
- Set and get port MRU
- Set and get port source filter
- Set and get port max frame size
- Set and get duplex/speed mode on one port
- Set and get ability/status of auto negotiation on one port
- Set and get power saving status on one port
- Set and get hibernate status on one port

- Run cable diagnostic test on one port
- Set and get 802.3az status on one port
- Set and get medium crossover type on one port
- Check current medium crossover status on one port
- Set and get port prefer medium type on one combo port
- Get current active medium type at one combo port
- Set and get fiber mode at one combo port
- Set and get port local loopback status on one port
- Set and get port remote loopback status on one port
- Set reset status on one port
- Set power off on one port
- Set power on one port
- Set magic frame MAC address on one port
- Get PHY ID on one port
- Set and get port wake on LAN status
- Set and get interface mode on one port
- Check current interface mode status on one combo port
- Apply interface mode of device
- Set and get port interface (both MAC and PHY) IEEE802.3az status on one port
- Set and get port flowctrl force mode status on one port
- Set and get port promiscmode on one port
- Set and get port interface eee configuration properties

2.2.2 VSI

VSI provides APIs for operation VSI entry. It supports following functions:

- Allocate a new VSI and free an unused VSI
- Set VSI entry for membership of forwarding, broadcast, unknown multicast and unknown unicast
- Set and get port based VSI
- Set and get VLAN based VSI
- Set and get VSI based FDB learning control
- Set and get VSI based FDB station move
- Get and cleanup VSI counters

2.2.3 Port VLAN

Port VLAN provides APIs for the port-based VLAN feature and QinQ feature based on VLAN translation advanced entry. It supports following functions:

- Set and get ingress and egress global QinQ mode
- Set and get ingress and egress QinQ mode based on port
- Set and get ingress STPID and CTPID
- Set and get egress STPID and CTPID
- Set and get ingress filter based on port, including VLAN filter, tag filter, untag filter and priority tag filter
- Set and get ingress and egress default VLAN tag based on port
- Set and get ingress and egress tag propagation based on port
- Set and get stag and ctag egress VLAN mode based on port
- Set and get port egress mode based on VSI
- Enable/disable VSI egress mode based on port
- Set and get the action when packet doesn't match any ingress translation entry based on port
- Get and cleanup VLAN counter based on counter index
- Add, delete, update and get port VLAN member based on port
- Add, delete and get ingress and egress VLAN translation advanced entry based on port

2.2.4 FDB

FDB is also called Address Resolution Lookup (ARL) table or MAC table by the other vendors, and provides APIs for maintaining forwarding data base in switch chip. It supports the following functions:

- Add and delete FDB entry
- First, next and find FDB entry
- Next FDB entries in extend mode
- First FDB entries in extend mode
- Replace or transfer old port ID with new port ID in FDB entry
- Set and get FDB dynamic learning status on switch chip
- Set and get new MAC address learning status and packet action based on port
- Set and get station move status and packet action based on port
- Set and get FDB aging status on switch chip
- Set and get FDB aging time on switch chip
- Iterate all FDB entries on switch chip

- Get learned FDB entry counter based on port
- Set and get MAC limit status, MAC limit counter and actions when exceeding MAC limited counter based on port

2.2.5 ACL

ACL provides APIs for defining policy and related actions for specific flow. It supports the following functions:

- Create and destroy ACL list
- Bind and unbind ACL list on one port
- Add, delete and query ACL rules in a ACL list

The sequence for user applications to implement ACL should as below:

- Create an ACL list
- Add ACL rules to the created ACL list
- Bind the list to a port. The ACL will take effect only when it is bind to port(s)

Since the programming for the ACL engine is complex, contact the local home switch support for further information.

2.2.6 QoS

QoS provides APIs for the QoS feature. It supports following functions:

- Set and get PCP group, DSCP group and flow group on one port.
- Set and get PCP/DSCP/preheader/flow/ACL priority precedence on one port
- Set and get PCP/DEI/DSCP change enable on one port
- Set and get PCP to PCP/DEI/DSCP/DP/internal priority mapping on one group
- Set and get flow to PCP/DEI/DSCP/DP/internal priority mapping on one group
- Set and get DSCP to PCP/DEI/DSCP/DP/internal priority mapping on one group
- Set and get queue scheduler for level 0 queue or level 1 SP
- Set and get queue bitmap for the EDMA Rx ring backpressure
- Get all queues belonging to one port
- Set and get dequeue control status for one queue
- Set and get QoS mode priority based on port
- Reset queue scheduler based on port to the DTS bootup configuration
- Get scheduler resource allocation based on port

2.2.7 Mirror

Mirror provides APIs for mirror feature. It supports following functions:

- Set and get analyzer port in switch chip for mirror
- Set and get ingress/egress mirror status for one port

2.2.8 Shaper

Shaper provides APIs for shaper feature. It supports following function:

- Set and get port based shaper timeslot value
- Set and get flow based shaper timeslot value
- Set and get queue based shaper timeslot value
- Set and get port based shaper entry
- Set and get flow based shaper entry
- Set and get queue based shaper entry
- Set and get port based shaper token number
- Set and get flow based shaper token number
- Set and get queue based shaper token number
- Set and get shaper IPG compensation length

2.2.9 Policer

Policer provides APIs for policer feature. It supports following function:

- Set and get policer timeslot value
- Set and get port based policer entry
- Set and get ACL based policer entry
- Set and get policer FCS compensation length
- Get port based policer counter statistics value
- Get ACL based policer counter statistics value
- Get policer global counter statistics value
- Set and Get policer bypass status.

2.2.10 STP

STP provides API for STP feature. It supports following functions:

- Set and get spanning tree state on one port

2.2.11 MIB

MIB provides APIs for getting MIB information from switch chip. It supports following functions:

- Get MIB information on one GMAC port
- Get MIB information on one XGMAC port
- Set and get MIB status
- Set and get CPU clear-on-read mode
- Flush the counters on one port.

2.2.12 IP

IP provides APIs for L3 IP route and multicast IP features. It supports following functions:

- Set and get ARP source guard configuration based on VSI
- Add, get, delete network entry by index
- Set and get L3 interface entry by index
- Set and get L3 interface entry index for VSI
- Set and get L3 interface entry index for port
- Set and get nexthop entry by index
- Set and get public IP entry by index
- Set and get IP source guard configuration based on VSI
- Set and get IP source guard configuration based on port
- Set and get ARP source guard configuration based on port
- Set and get MAC address based on port
- Set and get route miss action
- Set and get multicast mode based on VSI
- Set and get IP global control configuration
- Add, get, delete IP host entry

2.2.13 Flow

Flow provides APIs for flow 5/3 tuple features. It supports following functions:

- Set and get flow status enable or disable
- Set and get flow table aging time
- Set and get flow mgmt configuration based on flow type and flow direction
- Add, get, delete flow entry by key or index

- Add, get, delete flow host entry by key or index
- Set and get flow global configuration

2.2.14 Queue management

QM provides APIs for queue management features. It supports following functions:

- Set and get unicast queue base ID
- Set and get unicast queue priority class mapping
- Set and get multicast queue priority class mapping
- Flush one queue based on port
- Set and get unicast queue hash mapping
- Set and get unicast queue default hash value
- Set and get multicast queue cpucode class mapping
- Set and get admission control status based on group or queue
- Set and get admission control prealloc buffer number based on group or queue
- Set and get queue and group mapping for admission control
- Set and get queue static threshold based on group or queue
- Set and get queue dynamic threshold based on queue
- Set and get group buffer number based on group ID
- Set and get queue counter enable or disable
- Set and get counter for one queue
- Set and get enqueue control status
- Set and get queue source profile based on port

2.2.15 Buffer management

BM provides APIs for buffer management features. It supports following functions:

- Set and get BM control status based on port
- Set and get BM port and group mapping
- Set and get BM group buffer number by group ID
- Set and get BM port reserved buffer number based on port
- Set and get BM port static threshold based on port
- Set and get BM port dynamic threshold based on port
- Get BM port counters

2.2.16 Trunk

Trunk provides APIs for trunk features. It supports following functions:

- Set and get trunk group port member information
- Set and get trunk hash mode
- Set and get trunk failover status

2.2.17 PPPoE

PPPoE provides APIs for PPPoE features. It supports following functions:

- Add, get and delete PPPoE table for insert or remove PPPoE header when matched
- Enable or disable the L3 PPPoE offloading on a specific L3 interface

2.2.18 Service code

ServiceCode provides APIs for ServiceCode feature. It supports following functions:

- Set and get a servicecode which is for internal packet property and performs some special actions during packet transmitting.
- Enable or disable Layer2 loop check

2.2.19 Security

Sec provides APIs for Security features. It supports following functions:

- Set and get exception control info based on exception type
- Set and get small TTL and hoplimit value for exception check
- Set and get TCP flag and mask value for exception check

2.2.20 RSS HASH

RSSHASH provides APIs for RSS HASH feature. It supports following functions:

- Set and get a RSS hash through mask, fragment mode, seed and packet some options related with mix value

2.2.21 Control packet

Ctrlpkt provides APIs for management control packet feature. It supports following functions:

- Set and get Ethernet type
- Set and get RFDB MAC address
- Add, delete, getfirst, getnext and show control packet profile to forward, drop, CPYCPU, RDTCPU and bypass protocol control packets based on port bitmap, Ethernet type bitmap, RFDB bitmap and protocol type

2.2.22 Initialization

Initialization provides API for user applications to initialize the SSDK.

3 Building

This chapter gives an overview of directory architecture of SSDK and demonstrates how to build it in QSDK.

3.1 Directory structure

[/]	This is the root directory of the SSDK.
[/app]	This directory contains source code files of nathelper.
[/make]	This directory contains target files which define the components of building.
[/src]	All source code files of the SSDK are kept under this directory.
[/src/adpt]	This directory contains source code files for adapter that implement FAL APIs
[/src/api]	This directory contains source code files for API access interface.
[/src/fal]	This directory contains source code files for FAL. FAL can provide unified interfaces and wrap the difference among switch chips. Customers can access these interfaces and don't need to care internal details.
[/src/fal_uk]	This directory contains an example for user applications that invoke the SSDK built in kernel mode. It can be built with user applications together.
[/src/hsl]	This directory contains source code files for HSL that provides interfaces for a specific chip.
[/src/hsl/athena]	This directory contains source code files for AR8216.
[/src/hsl/garuda]	This directory contains source code files for AR8316.
[/src/hsl/phy]	This directory contains source code files for PHY driver.
[/src/hsl/shiva]	This directory contains source code files for AR8227/AR8228/AR8229.
[/src/hsl/horus]	This directory contains source code files for AR8236.
[/src/hsl/isis]	This directory contains source code files for AR8327/AR8328/AR8325.
[/src/hsl/isisc]	This directory contains source code files for AR8337.
[/src/hsl/dess]	This directory contains source code files for ESS module of IPQ40xx platform.
[/src/hsl/hppe]	This directory contains source code files for PPE module of IPQ807x/IPQ807xA/ IPQ817x platform.
[/src/shell]	This directory contains source code files all source code files for the SHELL.
[/src/init]	This directory contains source code files for the initialization of the SSDK.
[/src/ref]	This directory contains source code files for reference code.
[/src/sal]	This directory contains source code files for SAL.
[/src/sal/os]	This directory contains source code files for OSAPI.

[/src/sal/sd]	This directory contains source code files for SDAPI.
[/src/util]	This directory contains source code files for utility functions.
[/include]	All header files for the SSDK are kept under this directory.
[/include/api]	This directory contains header files for API access interface declarations.
[/include/common]	This directory contains public header files for the SSDK.
[/include/fal]	This directory contains header files of FAL.
[/include/hsl]	This directory contains header files of HSL.
[/include/hsl/athena]	This directory contains header files for AR8216.
[/include/hsl/garuda]	This directory contains header files for AR8316.
[/include/hsl/shiva]	This directory contains header files for AR8227/AR8228/AR8229.
[/include/hsl/horus]	This directory contains header files for AR8236.
[/include/hsl/isis]	This directory contains header files for AR8327/AR8328/AR8325.
[/include/hsl/isisc]	This directory contains header files for AR8337.
[/include/hsl/dess]	This directory contains header files for ESS module of IPQ40xx platform.
[/include/hsl/hppe]	This directory contains header files for PPE module of IPQ807x/IPQ807xA/IPQ817x platform.
[/include/init]	This directory contains header files for the initialization of the SSDK.
[/include/ref]	This directory contains header files for reference code declarations.
[/include/sal]	This directory contains header files for SAL.
[/include/sal/os]	This directory contains header files for OSAPI.
[/include/sal/sd]	This directory contains header files for SDAPI.
[/include/shell]	This directory contains header files for SHELL.

3.2 Building from the source

SSDK will be compiled into two files: qca-ssdk.ko; and ssdk_sh.

- qca-ssdk.ko is an independent kernel module included all SSDK features.
- ssdk_sh is an user program provided a cli-like simple shell.

3.2.1 Options

To satisfy the particular requirements, change the following options by editing the file config which locates in the root directory.

Switch chip type:

CHIP_TYPE = ALL_CHIP

ifneq ($(HK_CHIP), enable)

CHIP_TYPE=NONHK_CHIP

endif

FAL included in the SSDK:

FAL = TRUE

API_LOCK can define all APIs with locker or not. If you want all APIs with locker, define **API_LOCK=TRUE**. Otherwise, define **API_LOCK=FALSE.**

Features included in SSDK:

IN_ACL=TRUE

IN_FDB=TRUE

IN_IGMP=TRUE

IN_LEAKY=TRUE

IN_LED=TRUE

IN_MIB=TRUE

IN_MIRROR=TRUE

IN_MISC=TRUE

IN_PORTCONTROL=TRUE

IN_PORTVLAN=TRUE

IN_QOS=TRUE

IN_RATE=TRUE

IN_STP=TRUE

IN_VLAN=TRUE

IN_REDUCED_ACL=FALSE

IN_COSMAP= FALSE

IN_IP= FALSE

IN_NAT= FALSE

IN_TRUNK= FALSE

IN_SEC= FALSE

IN_NAT_HELPER=FALSE

IN_INTERFACECONTROL=TRUE

IN_MACBLOCK=FALSE

IN_VSI=TRUE

IN_CTRLPKT=TRUE

IN_SERVCODE=TRUE

IN_BM=TRUE

IN_SHAPER=TRUE

IN_POLICER=TRUE

IN_UNIPHY=TRUE

For example, if you don’t need the ACL feature, set the value of IN_ACL to FALSE, then the target of building will exclude the ACL related APIs.

3.2.2 Build target

1. Select SSDK in make menuconfig
   a. Make menuconfig
   b. Use the following path to select qca-ssdk module: Kernel modules → Network Devices → Kmod-qca-ssdk
   c. Then save, and exit.
2. Building SSDK
   - Make package/qca-ssdk/install V = s
3. Clean SSDK
   - Make package/qca-ssdk/clean

4 Porting

4.1 Initialization

SSDK initialization occurs when qca-ssdk.ko is inserted into kernel, and the initialization process is independent of the other modules.

In QSDK, an auto-load ID is specified to determine the loading time of qca-ssdk.ko.

4.2 Register access

In QSDK, Linux kernel provides the standard MII bus interface. If the switch module connects to CPU through MDIO bus, SSDK uses the interface to access switch registers by a specified bus name.

For example:

```
snprintf(busid, MII_BUS_ID_SIZE, "%s.%d", "mdio-gpio", 0);
miidev = bus_find_device_by_name(&platform_bus_type, NULL, busid);
miibus = dev_get_drvdata(miidev);
miibus->write(bus, phy_addr, QCA_MII_MMD_ADDR, addr);
For Hawkeye SOC, switch module is accessed through Ahb bus and SSDK maps
physical address and use local bus access mode to access switch registers.
For example:
ioremap_nocache(ssdk_dt_global.switchreg_base_addr,
                ssdk_dt_global.switchreg_size);
readl(hw_addr + reg_addr)
writel(reg_val, hw_addr + reg_addr);
```

5 Shell

5.1 Shell basics

The SSDK includes a CLI-like switch shell to configure the switch on Linux. If you have built the shell refer to Building, you can invoke it by executing the file ssdk_sh.

The SSDK provides some useful help mechanisms to facilitate the usage of the shell. To get help specific to a command mode, a command, a keyword, or an argument, use one of following commands:

- Entering a question mark (?) at the shell prompt allows you to obtain a list of commands available for each command mode.
- Entering "*abbreviated-command*?" and the shell shows a list of commands that begin with a particular character string. (No space between command and question mark.)
- Entering "*Command ?*" to get the keywords or arguments that you must enter next on the command line. (One space between command and question mark.)
- Entering "*abbreviated-command<Tab>*", the shell completes a partial command name or lists all commands partially matched Help messages of the SSDK using the following conventions:
  - Required command arguments are inside angle brackets (< >).
  - Optional command arguments are in square brackets ([ ]).
  - Alternative keywords are separated by vertical bars (|).
  - The minimum and the maximum of a value range are separated by horizontal line (-).

To quit the shell, you can enter "**q**" or "**quit**" at the shell prompt.

5.2 Detailed commands

5.2.1 Port control

Name	Function	Usage
port txmacstatus set	Set Tx MAC status of a port	port txmacstatus set <port_id> <enable | disable>
port txmacstatus get	Get Tx MAC status of a port	port txmacstatus get <port_id>
port rxmacstatus set	Set Rx MAC status of a port	port rxmacstatus set <port_id> <enable | disable>
port rxmacstatus get	Get Rx MAC status of a port	port rxmacstatus get <port_id>
port txfcstatus set	Set Tx flow contorl of a port	port txfcstatus set <port_id> <enable | disable>
port txfcstatus get	Get Tx flow contorl of a port	port txfcstatus get <port_id>

Name	Function	Usage
port rxfcstatus set	Set Rx flow contorl of a port	port rxfcstatus set <port_id> <enable | disable>
port rxfcstatus get	Get Rx flow contorl of a port	port rxfcstatus get <port_id>
port flowCtrl set	Set flow control status of a port	port flowCtrl set <port_id> <enable | disable>
port flowCtrl get	Get flow control status of a port	port flowCtrl get <port_id>
port mtu set	Set MTU of a port	port mtu set <port_id>
port mtu get	Get MTU of a port	port mtu get <port_id>
port mru set	Set MRU of a port	port mru set <port_id>
port mru get	Get MRU of a port	port mru get <port_id>
port srcfilter set	Set srcfilter of a port	port srcfilter set <port_id> <enable | disable>
port srcfilter get	Get srcfilter of a port	port srcfilter get <port_id> <enable | disable>
port frameMaxSize set	Set max framesize of a port	port frameMaxSize set <port_id> <frame_max_size>
port frameMaxSize get	Get max framesize of a port	port frameMaxSize get <port_id>
port duplex get	Get duplex mode of a port	port duplex get <port_id>
port duplex set	Set duplex mode of a port	port duplex set <port_id> <half | full>
port speed get	Get speed mode of a port	port speed get <port_id>
port speed set	Set speed mode of a port	port speed set <port_id> <port_id> <10|100|1000|2500|5000|10000>
port autoAdv get	Get auto-negotiation advertisement of a port	port autoAdv get <port_id>
port autoAdv set	Set auto-negotiation advertisement of a port	port autoAdv set <port_id> <cap_bitmap>
port autoNeg enable	Enable auto-negotiation of a port	port autoNeg enable <port_id>
port autoNeg restart	Restart auto-negotiation process of a port	port autoNeg restart <port_id>
port powersave set	Set power saving status of a port	port powersave set <port_id> <enable | disable>
port powersave get	Get power saving status of a port	port powersave get <port_id>
port hibernate set	Set hibernate status of a port	port hibernate set <port_id> <enable | disable>
port hibernate get	Get hibernate status of a port	port hibernate set <port_id>
port cdt run	Run cable diagnostic test of a port	port cdt run <port_id> <mdi_pair>
port linkstatus get	Get link status of a port	port linkstatus get <port_id>
port ieee8023az set	Set the EEE ability	port ieee8023az set <port_id> <enable | disable>
port ieee8023az get	Get the EEE ability status	Port ieee8023az get <port_id>
port crossover set	Set the crossover of a port	Port crossover set <port_id> <auto|mdi|mdix>
port crossover get	Get the crossover mode of a port	port crossover get <port_id>

Name	Function	Usage
port crossover status	Get the crossover mode currently of a port	port crossover status <port_id>
port prefermedium set	Set the prefer medium of a port	port preferMedium set <port_id> <copper|fiber>
port prefermedium get	Get the prefer medium of a port	port preferMedium get <port_id>
port fibermode set	Set the fiber mode of a port.	port fiberMode set <port_id> <100fx|1000bx|10g-r>
port fibermode get	Get the fibe mode of a port	port fiberMode get <port_id>
port localLoopback set	Set the local loopback of a port	port localLoopback set <port_id> <enable|disable>
port localloopback get	Get the local loopback status of a port	port localLoopback get <port_id>
port remoteloopback set	Set the remote loopback status of a port	port remoteLoopback set <port_id> <enable|disable>
port remoteloopback get	Get the remote loopback status of a port	port remoteLoopback get <port_id>
port reset set	Set port reset of a port	port reset set <port_id>
port power off	Set port power off of a port	port poweroff set <port_id>
port power on	Set port power on of a port	port poweron set <port_id>
port magic frame address set	Set port magic frame address of a port	port magicFrameMac set <port_id> <mac_address>
port magic frame address get	Get port magic frame address of a port	port magicFrameMac get <port_id>
port phy id get	Get port PHY ID of a port	port phyId get <port_id>
port wolstatus set	Set port WOL status of a port	port wolstatus set <port_id> <enable|disable>
port wolstatus get	Get port WOL status of a port	port wolstatus get <port_id>
port interfacemode set	Set port interface mode of a port	port interfaceMode set <port_id> <psgmii_baset|psgmii_bx1000| psgmii_fx100|psgmii_amdet|sgmii_baset||qsgmii| usxgmii |sgmii_plus|10gbase_r|sgmii_fiber|psgmii_fiber| interfa
port interfacemode get	Get port interface mode of a port	port interfaceMode get <port_id>
port interfacemode status get	Get port current interface mode of a port	port interfaceMode status <port_id>
port interfacemode apply	Apply interface mode of device	port interfaceMode apply
port interface3az set	Set the EEE ability	port interface3az set <port_id> <enable | disable>
port interface3az get	Get the EEE ability status	port interafce3az get <port_id>
port flowctrlforcemode set	Set flowctrl force mode status	port flowctrlforcemode set <port_id> <enable | disable>
port flowctrlforcemode get	Get flowctrl force mode status	port flowctrlforcemode get

Name	Function	Usage
port promiscmode set	Set promisc mode status	port promiscmode set <port_id> <enable | disable>
port promiscmode get	Get promisc mode status	port promiscmode get
port eeecfg set	Set eee configuration properties	port eeecfg set <port_id>
port eeecfg get	Get eee configuration properties	port eeecfg get <port_id>

5.2.2 VSI

Name	Function	Usage
vsi vsiid alloc	Allocate a new VSI	vsi vsiid alloc
vsi vsiid free	Free a unused VSI	vsi vsiid free
vsi portbasedvsi set	Set port based VSI	vsi portbasedvsi set <port_id> <vsi>
vsi portbasedvsi get	Get port based VSI	vsi portbasedvsi get <port_id>
vsi vlanbasedvsi set	Set VLAN based VSI	vsi vlanbasedvsi set <port_id> <stag_vid> <ctag_vid> <vsi>
vsi vlanbasedvsi get	Get VLAN based VSI	vsi vlanbasedvsi get <port_id> <stag_vid> <ctag_vid>
vsi learnctrl set	Set VSI based learning control	vsi learnctrl set <vsi> <lrn_en> <action>
vsi learnctrl get	Get VSI based learning control	vsi learnctrl get <vsi>
vsi stationmove set	Set VSI based station move	vsi stationmove set <vsi> <stamove_en> <action>
vsi stationmove get	Get VSI based station move	vsi stationmove set <vsi>
vsi member set	Set membership of VSI	vsi member set <vsi> <member_ports>
vsi member get	Get membership of VSI	vsi member get <vsi>
vsi counter get	Get VSI based counter	vsi counter get <vsi>
vsi counter cleanup	Clearup VSI counters	vsi counter cleanup <vsi>

5.2.3 Port VLAN

Available in PPE only.

Name	Function	Usage
portvlan globalqinqmode set	Set global QinQ mode, including mask, ingress mode and egress mode	portvlan globalqinqmode set
portvlan globalqinqmode get	Get global QinQ mode, including ingress mode and egress mode	portvlan globalqinqmode get
portvlan ptqinqmode set	Set QinQ mode based on port, including ingress mode and egress mode	portvlan ptqinqmode set <port_id>
portvlan ptqinqmode get	Get QinQ mode based on port, including ingress mode and egress mode	portvlan ptqinqmode get <port_id>
portvlan intpid set	Set ingress TPID, including mask, CTPID and STPID value	portvlan intpid set

Name	Function	Usage
portvlan intpid get	Get ingress TPID, including CTPID and STPID value	portvlan intpid get
portvlan egtpid set	Set egress TPID, including mask, CTPID and STPID value	portvlan egtpid set
portvlan egtpid get	Get egress TPID, including CTPID and STPID value	portvlan egtpid get
portvlan ingressfilter set	Set ingress filter based on port, including VLAN filter, tag filter, untag filter and priority tag filter	portvlan ingressfilter set <port_id>
portvlan ingressfilter get	Get ingress filter based on port, including VLAN filter, tag filter, untag filter and priority tag filter	portvlan ingressfilter get <port_id>
portvlan defaultvlantag set	Set default tag based on port, including default CVID, default SVID, mask, default CPRI, default SPRI, default CDEI and default SDEI	portvlan defaultvlantag set <port_id> <all|ingress|egress>
portvlan defaultvlantag get	Get default tag based on port, including default CVID, default SVID, default CPRI, default SPRI, default CDEI and default SDEI	portvlan defaultvlantag get <port_id> <all|ingress|egress>
portvlan tagpropagation set	Set tag propagation based on port, including VID propagation, PRI propagation and DEI propagation	portvlan tagpropagation set <port_id> <all|ingress|egress>
portvlan tagpropagation get	Get tag propagation based on port, including VID propagation, PRI propagation and DEI propagation	portvlan tagpropagation get <port_id> <all|ingress|egress>
portvlan egmode set	Set egress VLAN mode based on port, including mask, ctag and stag mode	portvlan egmode set <port_id>
portvlan egmode get	Get egress VLAN mode based on port, including ctag and stag mode	portvlan egmode get <port_id>
portvlan translationmissaction set	Set the action when packet doesn't match any ingress translation entry based on port	Set the action when packet doesn't match any ingress translation entry based on port
portvlan translationmissaction get	Get the action when packet doesn't match any ingress translation entry based on port	portvlan translationmissaction get <port_id>
portvlan vsiegmode set	Set a port egress mode based on VSI	portvlan vsiegmode set <vsi> <port_id> <untagged/tagged/unmodified/ untouched>
portvlan vsiegmode get	Get a port egress mode based on VSI	portvlan vsiegmode get <vsi> <port_id>
portvlan vsiegmodeen set	Enable/disable VSI egress mode based on port	portvlan vsiegmodeen set <port_id> <enable|disable>
portvlan vsiegmodeen get	Get VSI egress mode status based on port	portvlan vsiegmodeen get <port_id>
portvlan translationadv add	Add a VLAN advanced translation entry based on port and direction	portvlan translationadv add <port_id> <ingress|egress>
portvlan translationadv del	Delete a VLAN advanced translation entry based on port and direction	portvlan translationadv del <port_id> <ingress|egress>

Name	Function	Usage
portvlan translationadv getfirst	Get a VLAN advanced translation first entry based on port and direction	portvlan translationadv getfirst <port_id> <ingress|egress>
portvlan translationadv getnext	Get a VLAN advanced translation next entry based on port and direction	portvlan translationadv getnext <port_id> <ingress|egress>
portvlan counter flush	Flush VLAN counter based on counter index	portvlan counter flush <index>
portvlan counter get	Get VLAN counter based on counter index	portvlan counter get <index>
portvlan member add	Add a member to the port based VLAN of a port	portvlan member add <port_id> <member>
portvlan member del	Delete a member from the port based VLAN of a port	portvlan member del <port_id> <member>
portvlan member update	Update members of the port based VLAN of a port	portvlan member update <port_id> <port_bitmap>
portvlan member get	Get members of the port based VLAN of a port	portvlan member get <port_id>

5.2.4 FDB

Name	Function	Usage
fdb entry add	Add a FDB entry	fdb entry add
fdb entry flush	Delete all FDB entries	fdb entry flush <0:dynamic only| 1:dynamic and static>
fdb entry show	Show whole FDB entries	fdb entry show
fdb portentry flush	Flush all FDB entries by a port	fdb portentry flush <port_id> <0:dynamic only|1:dynamic and static>
fdb fidentry flush	Flush all FDB entries by a FID	fdb fidentry flush <fid> <0:dynamic only|1:dynamic and static>
fdb entry del	Delete a FDB entry	fdb entry del
fdb firstentry find	Find the first FDB entry	fdb firstEntry find
fdb nextentry find	Find next FDB entry	fdb nextEntry find
fdb entry extendfirst	Find first FDB entry with filtered fields	fdb entry extendfirst
fdb entry extendnext	Find the next FDB entry with filtered fields	fdb entry extendnext
fdb entry find	Find a FDB entry	fdb entry find
fdb entry transfer	Replace or transfer old port ID with new port ID in FDB entry	fdb entry transfer <old port_id> <new port_id> <fid>
fdb learnctrl set	Set FDB entry global learning status	fdb learnctrl set <enable|disable>
fdb learnctrl get	Get FDB entry global learning status	fdb learnctrl get
fdb ptlearnctrl set	Set new MAC address learning status and packet action based on port	fdb ptlearnctrl set <port_id> <enable| disable> <forward|drop|cpycpu|rdtcpu>
fdb ptlearnctrl get	Get new MAC address learning status and packet action based on port	fdb ptlearnctrl get <port_id>

Name	Function	Usage
fdb ptstationmove set	Set station move status and packet action based on port	fdb ptstationmove set < port_id> <enable|disable> <forward|drop| cpycpu|rdtcpu>
fdb ptstationmove get	Get station move status and packet action based on port	fdb ptstationmove get <port_id>
fdb agectrl set	Set FDB entry aging status	fdb agectrl set <enable | disable>
fdb agectrl get	Get FDB entry aging status	fdb agectrl get
fdb agetime set	Set FDB entry aging time	fdb ageTime set <time:s>
fdb agetime get	Get FDB entry aging time	fdb ageTime get
fdb entry iterate	Get next valid index of FDB entry	fdb entry iterate <iterator>
fdb ptlearncounter get	Get learned FDB entry counter based on a port	fdb ptlearncounter get <port_id>
fdb ptmaclimitctrl set	Set MAC limit status, MAC limit counter and actions when exceeding MAC limited counter based on port	fdb ptmaclimitctrl set <port_id>
fdb ptmaclimitctrl get	Get MAC limit status, MAC limit counter and actions when exceeding MAC limited number based on a port	fdb ptmaclimitctrl get <port_id>

5.2.5 ACL

Name	Function	Usage
acl list create	Create an ACL list	acl list create <list_id> <priority>
acl list destroy	Destroy an ACL list	acl list destroy <list_id>
acl list bind	Bind an ACL list to a port	acl list bind <list_id> <0-0:direction> <0-0:objtype> <objindex>
acl list unbind	Unbind an ACL list from a port	acl list unbind <list_id> <0-0:direction> <0-0:objtype> <objindex>
acl rule add	Add ACL rules to an ACL list	acl rule add <list_id> <rule_id> <rule_nr>
acl rule delete	Delete ACL rules from an ACL list	acl rule delete <list_id> <rule_id> <rule_nr>
acl rule query	Query a ACL rule	acl rule query <list_id> <rule_id>
acl udf set	Set UDF profile	acl udf set <non-ip/ipv4/ipv6> <0-3> <l2/l3/l4> <offset>
acl udf get	Get UDF profile	acl udf get <non-ip/ipv4/ipv6> <0-3>

5.2.6 QoS

Name	Function	Usage
qos ptgroup set	Set the port QOS group ID for PCP, DSCP and flow remapping based on port	qos ptgroup set <port_id>
qos ptgroup get	Get the port QOS group ID for PCP, DSCP and flow remapping based on port	qos ptgroup get <port_id>
qos ptpriprece set	Set the QOS priority precedence based on port	qos ptpriprece set <port_id>

Name	Function	Usage
qos ptpriprece get	Get the QOS priority precedence based on port	qos ptpriprece get <port_id>
qos ptremark set	Set the port PCP/DEI/DSCP change enable or disable	qos ptremark set <port_id>
qos ptremark get	Get the port PCP/DEI/DSCP change enable or disable	qos ptremark get <port_id>
qos pcpmap set	Set the pcp remapping to internal PCP, DSCP, priority, DP based on group	qos pcpmap set <group_id> <pcp>
qos pcpmap get	Get the pcp remapping to internal PCP, DSCP, priority, DP based on group	qos pcpmap get <group_id> <pcp>
qos flowmap set	Set the flow remapping to internal PCP, DSCP, priority, DP based on group	qos flowmap set <group_id> <flow>
qos flowmap get	Get the flow remapping to internal PCP, DSCP, priority, DP based on group	qos flowmap get <group_id> <flow>
qos dscpmap set	Set the DSCP remapping to internal PCP, DSCP, priority, DP based on group	qos dscpmap set <group_id> <dscp>
qos dscpmap get	Get the DSCP remapping to internal PCP, DSCP, priority, DP based on group	qos dscpmap get <group_id> <dscp>
qos qscheduler set	Set the queue scheduler for level 0 queue or level 1 SP	qos qscheduler set <node_id> <level> <port_id>
qos qscheduler get	Get the queue scheduler for level 0 queue or level 1 SP	qos qscheduler get <node_id> <level>
qos ringqueue set	Set the queue bitmap for the EDMA Rx ring backpressure	qos ringqueue set <ring_id>
qos ringqueue get	Get the queue bitmap for the EDMA Rx ring backpressure	qos ringqueue get <ring_id>
qos portqueues get	Get all queues belonging to one port	qos portqueues get <port_id>
qos dequeue set	Set the dequeue control status	qos dequeue set <queue_id> <status>
qos dequeue get	Get the dequeue control status	qos dequeue get <queue_id>
qos ptModePri set	Set the QOS mode priority based on port	qos ptModePri set <port_id> <da|up| dscp| flow> <priority:0-3>
qos ptModePri get	Get the QOS mode priority based on port	qos ptModePri set <port_id> <da|up| dscp| flow>
qos portscheduler reset	Reset the queue scheduler based on port	qos portscheduler set <port_id>

5.2.7 Mirror

Name	Function	Usage
mirror analyPt set	Set mirror analysis port	mirror analyPt set <port_id>
mirror analyPt get	Get mirror analysis port	mirror analyPt get
mirror ptIngress set	Set ingress mirror status of a port	mirror ptIngress set <port_id> <enable | disable>
mirror ptIngress get	Get ingress mirror status of a port	mirror ptIngress get <port_id>

Name	Function	Usage
mirror ptEgress set	Set egress mirror status of a port	mirror ptEgress set <port_id> <enable | disable>
mirror ptEgress get	Get egress mirror status of a port	mirror ptEgress get <port_id>
mirror analycfg set	Set analysis configuration, including ingress or egress analysis port and its queue priority	mirror analycfg set <both|ingress|egress>
mirror analycfg get	Get analysis configuration, including ingress or egress analysis port and its queue priority	mirror analycfg get <both|ingress|egress>

5.2.8 Shaper

Name	Function	Usage
shaper porttimeslot set	Set port based shaper timeslot	shaper porttimeslot set <value>
shaper porttimeslot get	Get port based shaper timeslot	shaper porttimeslot get
shaper flowtimeslot set	Set flow based shaper timeslot	shaper flowtimeslot set <value>
shaper flowtimeslot get	Get flow based shaper timeslot	shaper flowtimeslot get
shaper queuetimeslot set	Set queue based shaper timeslot	shaper queuetimeslot set <value>
shaper queuetimeslot get	Get queue based shaper timeslot	shaper queuetimeslot get
shaper portshaper set	Set a port shaper entry	shaper portshaper set <port_id>
shaper portshaper get	Get a port shaper entry	shaper portshaper get <port_id>
shaper flowshaper set	Set a flow shaper entry	shaper flowshaper set <flow_id>
shaper flowshaper get	Get a flow shaper entry	shaper flowshaper get <flow_id>
shaper queueshaper set	Set a queue shaper entry	shaper queueshaper set <queue_id>
shaper queueshaper get	Get a queue shaper entry	shaper queueshaper get <queue_id>
shaper porttoken set	Set a port token number	shaper porttoken set <port_id>
shaper porttoken get	Get a port token number	shaper porttoken get <port_id>
shaper flowtoken set	Set a flow token number	shaper flowtoken set <flow_id>
shaper flowtoken get	Get a flow token number	shaper flowtoken get <flow_id>
shaper queuetoken set	Set a queue token number	shaper queuetoken set <queue_id>
shaper queuetoken get	Get a queue token number	shaper queuetoken get <queue_id>
shaper ipgcompensation set	Set shaper IPG compenstaton length	shaper ipgcompensation set <value>
shaper ipgcompensation get	Get shaper IPG compenstaton length	shaper ipgcompensation get

5.2.9 Policer

Name	Function	Usage
policer timeslot set	Set policer timeslot value	policer timeslot set <value>
policer timeslot get	Get policer timeslot value	policer timeslot get

Name	Function	Usage
policer portentry set	Set a port policer entry	policer portentry set <port_id>
policer portentry get	Get a port policer entry	policer portentry get <port_id>
policer aclentry set	Set a ACL policer entry	policer aclentry set <index>
policer aclentry get	Get a ACL policer entry	policer aclentry get <index>
policer fcscompensation set	Set policer FCS compensation	policer fcscompensation set
policer fcscompensation get	Get policer FCS compensation	policer fcscompensation get
policer portcounter get	Get port based policer counter statistics	policer portcounter get <port_id>
policer aclcounter get	Get ACL based policer counter statistics	policer aclcounter get <index>
policer globalcounter get	Get global policer counter statisitcs	policer globalcounter get
policer bypass set	Set policer bypass status	policer bypass set <frame_type> <enable>
policer bypass get	Get policer bypass status	policer bypass get <frame_type>

5.2.10 STP

Name	Function	Usage
stp ptState set	Set STP state of a port	stp ptState set st_id <port_id> <disable | block | listen | learn | forward>
stp portState get	Get STP state of a port	stp ptState get st_id <port_id>

5.2.11 MIB

Name	Function	Usage
mib statistics get	Get statistics information of a GMAC port	mib statistics get <port_id>
mib xgstatistics get	Get statistics information of a XGMAC port	mib xgstatistics get <port_id>
mib status set	Get MIB status	mib status set <enable | disable>
mib status get	Get MIB status	mib status get
mib counters flush	Flush the counters of a port	mib counters flush <port_id>
mib cpuKeep set	Set the clear-on-read mode	mib cpuKeep set <enable | disable>
mib cpuKeep get	Get the clear-on-read mode	mib cpukeep get
mib counter get	Get the information of a port	mib counter get <port_id>

5.2.12 IP

Name	Function	Usage
ip vsiarpsg set	Set the ARP source guard configuration based on VSI	ip vsiarpsg set <vsi>
ip vsiarpsg get	Get the ARP source guard configuration based on VSI	ip vsiarpsg get <vsi>
ip networkroute add	Add a network entry by index	ip networkroute add <index>
ip networkroute get	Get a network entry by index	ip networkroute add <index> <type>
ip networkroute del	Delete a network entry by index	ip networkroute del <index> <type>
ip intf set	Set the L3 interface entry by index	ip intf set <index>
ip intf get	Get the L3 interface entry by index	ip intf get <index>
ip vsiintf set	Set the interface index for VSI	ip vsiintf set <vsi>
ip vsiintf get	Get the interface index for VSI	ip vsiintf get <vsi>
ip portintf set	Set the interface entry index for port	ip portintf set <port_id>
ip portintf get	Get the interface entry index for port	ip portintf get <port_id>
ip nexthop set	Set a nexthop entry by index	ip nexthop set *<index>*
ip nexthop get	Get a nexthop entry by index	ip nexthop get *<index>*
ip pubip set	Set a public IP entry by index	ip pubip set *<index>*
ip pubip get	Get a public IP entry by index	ip pubip get *<index>*
ip vsisg set	Set the IP source guard configuration based on VSI	ip vsisg set *<vsi>*
ip vsisg get	Get the IP source guard configuration based on VSI	ip vsisg get *<vsi>*
ip portsg set	Set the IP source guard configuration based on port	ip portsg set *<port_id>*
ip portsg get	Get the IP source guard configuration based on port	ip portsg get *<port_id>*
ip portarpsg set	Set the ARP source guard configuration based on port	ip portarpsg set *<port_id>*
ip portarpsg get	Get the ARP source guard configuration based on port	ip portarpsg get *<port_id>*
ip portmac set	Set the MAC address for the specified port	ip portmac set *<port_id>*
ip portmac get	Get the MAC address for the specified port	ip portmac get *<port_id>*
ip routemiss set	Set the route miss action	ip routemiss set *<action>*
ip routemiss get	Get the route miss action	ip routemiss get *<action>*
ip mcmode set	Set the multicast mode based on VSI	ip mcmode set *<vsi>*
ip mcmode get	Get the multicast mode based on VSI	ip mcmode get *<vsi>*
ip globalctrl set	Set the IP global control configuration	ip globalctrl set
ip globalctrl get	Get the IP global control configuration	ip globalctrl get

5.2.13 Flow

Name	Function	Usage
flow status set	Set the flow status enable or disable	flow status set <status>
flow status get	Get the flow status enable or disable	flow status get <status>
flow agetime set	Set the flow table aging time	flow agetime set
flow agetime get	Get the flow table aging time	flow agetime get
flow mgmt set	Set the flow mgmt configuration based on flow type and flow direction	flow mgmt set <type> <dir>
flow mgmt get	Get the flow mgmt configuration based on flow type and flow direction	flow mgmt get <type> <dir>
flow entry add	Add one flow entry by key or index	flow entry add <add_mode>
flow entry get	Get one flow entry by key or index	flow entry get <get_mode>
flow entry del	Delete one flow entry by key or index	flow entry del <del_mode>
flow host add	Add one flow host entry by key or index	flow host add <add_mode>
flow host get	Get one flow host entry by key or index	flow host get <get_mode>
flow host del	Delete one flow host entry by key or index	flow host del <del_mode>
flow global set	Set the flow global configuration	flow global set
flow global get	Get the flow global configuration	flow global get

5.2.14 Queue management

Name	Function	Usage
qm ucastqbase set	Set the QM unicast queue base ID	qm unicastqbase set
qm ucastqbase get	Get the QM unicast queue base ID	qm unicastqbase get
qm ucastpriclass set	Set the QM unicast queue priority class mapping	qm ucastpriclass set <profile > < priority> <class>
qm ucastpriclass get	Get the QM unicast queue priority class mapping	qm ucastpriclass get <profile > < priority>
qm mcastpriclass set	Set the QM multicast queue priority class mapping	qm mcastpriclass set <port_id> < priority> <class>
qm mcastpriclass get	Get the QM multicast queue priority class mapping	qm mcastpriclass get <port_id> < priority>
qm queue flush	Flush one queue based on port	qm queue flush <port_id> <queue_id>
qm ucasthash set	Set the QM unicast queue hash mapping	qm ucasthash set <profile > < rss_hash> <queue_hash>
qm ucasthash get	Get the QM unicast queue hash mapping	qm ucasthash get <profile > < rss_hash>
qm ucastdflthash set	Set the QM unicast queue default hash	qm ucastdflthash set <queue_hash>
qm ucastdflthash get	Get the QM unicast queue default hash	qm ucastdflthash get
qm mcastcpucode set	Set the QM multicast queue cpucode class mapping	qm mcastcpucode set <cpu_code> <class>

Name	Function	Usage
qm mcastcpucode get	Get the QM multicast queue cpucode class mapping	qm mcastcpucode get <cpu_code>
qm acctrl set	Set the QM admission control status based on group or queue	qm acctrl set
qm acctrl get	Get the QM admission control status based on group or queue	qm acctrl get
qm acprebuffer set	Set the QM admission control prealloc buffer number based on group or queue	qm acprebuffer set
qm acprebuffer get	Get the QM admission control prealloc buffer number based on group or queue	qm acprebuffer get
qm acgroup set	Set the QM queue and group mapping	qm acqgroup set <queue_id> <group_id>
qm acgroup get	Get the QM queue and group mapping	qm acqgroup get <queue_id>
qm acstaticthesh set	Set the QM queue static threshold based on group or queue	qm acstaticthesh set
qm acstaticthesh get	Get the QM queue static threshold based on group or queue	qm acstaticthesh get
qm acdtaticthesh set	Set the QM queue dynamic threshold based on group or queue	qm acdtaticthesh set
qm acdtaticthesh get	Get the QM queue dynamic threshold based on group or queue	qm acdtaticthesh get
qm acgroupbuff set	Set the QM group buffer number based on group ID	qm acgroupbuff set <group_id>
qm acgroupbuff get	Get the QM group buffer number based on group ID	qm acgroupbuff get <group_id>
qm cntctrl set	Set the QM counter enable or disable	qm cntctrl set <status>
qm cntctrl get	Get the QM counter enable or disable	qm cntctrl get
qm enqueue set	Set the QM enqueue control status	qm enqueue set <queue_id> <enable>
qm enqueue get	Get the QM enqueue control status	qm enqueue get <queue_id>
qm srcprofile set	Set the QM source profile based on port	qm srcprofile set <port_id> <src_profile>
qm srcprofile get	Get the QM source profile based on port	qm srcprofile get <port_id>

5.2.15 Buffer management

Name	Function	Usage
bm ctrl set	Set the BM control status based on port	bm ctrl set <port_id> <status>
bm ctrl get	Get the BM control status based on port	bm ctrl get <port_id>
bm portgroupmap set	Set the BM port and group mapping	bm ctrl set <port_id> <group_id>
bm portgroupmap get	Get the BM port and group mapping	bm ctrl get <port_id>
bm groupbuff set	Set the BM group buffer number by group ID	bm groupbuff set <group_id> <buff_num>
bm groupbuff get	Get the BM group buffer number by group ID	bm groupbuff get <group_id>
bm portrsvbuff set	Set the BM port reserved buffer number based on port	bm portrsvbuff set <port_id> <prealloc_num> <react_num>

Name	Function	Usage
bm portrsvbuff get	Get the BM port reserved buffer number based on port	bm portrsvbuff get <port_id> <prealloc_num> <react_num>
bm portsthresh set	Set the BM port static threshold based on port	bm portsthresh set <port_id>
bm portsthresh get	Get the BM port static threshold based on port	bm portsthresh get <port_id>
bm portdthresh set	Set the BM port dynamic threshold based on port	bm portdthresh set <port_id>
bm portdthresh get	Get the BM port dynamic threshold based on port	bm portdthresh get <port_id>
bm portcounter get	Get the BM port counters	bm portcounter get <port_id>

5.2.16 Trunk

Name	Function	Usage
trunk group set	Set trunk group member info	trunk group set <trunk_id> <disable|enable> <port_bitmap>
trunk group get	Get trunk group member info	trunk group get <trunk_id>
trunk hashmode set	Set trunk hash mode	trunk hashmode set <hash_mode>
trunk hashmode get	Get trunk hash mode	trunk hashmode get <trunk_id>
trunk failover set	Set the trunk failover status	trunk failover set <enable|disable>
trunk failover get	Get the trunk failover status	trunk failover get

5.2.17 PPPoE

Name	Function	Usage
misc extendpppoe add	Add a PPPoE session entry	misc extendpppoe add
misc extendpppoe get	Get a PPPoE session entry	misc extendpppoe get
misc extendpppoe del	Delete a PPPoE session entry	misc extendpppoe del
misc pppoeen set	Enable or disable the L3 PPPoE offloading on a specific L3 interface	misc pppoeen set <l3if_index> <enable|disable>
misc pppoeen get	Get an L3 interface PPPoE status	misc pppoeen get <l3if_index>

5.2.18 Service code

Name	Function	Usage
servcode config set	Set a service code config based on index	servcode config set <servcode_index>
servcode config get	Get a service code config based on index	servcode config get <servcode_index>

Name	Function	Usage
servcode loopcheck set	Set a service code loopcheck status	servcode loopcheck set <enable| disable>
servcode loopcheck get	Get a service code loopcheck status	servcode loopcheck get

5.2.19 Security

Name	Function	Usage
sec expctrl set	Set exception control information	sec expctrl set <excp_type>
sec expctrl get	Get exception control information	sec expctrl get <excp_type>
sec l3parser set	Set the small TTL and hoplimit value for exception check	sec l3parser set
sec l3parser get	Get the small TTL and hoplimit value for exception check	sec l3parser get
sec l4parser set	Set the TCP flag and mask value for exception check	sec l4parser set
sec l4parser get	Get the TCP flag and mask value for exception check	sec l4parser get

5.2.20 RSS HASH

Name	Function	Usage
rsshash config set	Set RSS hash related configurations	rsshash config set <ipv4v6|ipv4|ipv6>
rsshash config get	Get RSS hash related configurations	rsshash config get <ipv4v6|ipv4|ipv6>

5.2.21 Control packet

Name	Function	Usage
ctrlpkt ethernettype set	Set an Ethernet type based on profile ID	ctrlpkt ethernettype set <profile_id> <ethernettype>
ctrlpkt ethernettype get	Get an Ethernet type based on profile ID	ctrlpkt ethernettype get <profile_id>
ctrlpkt rfdb set	Set a RFDB MAC address based on profile ID	ctrlpkt rfdb set <profile_id> <rfdb_macaddr>
ctrlpkt rfdb get	Get a RFDB MAC address based on profile ID	ctrlpkt rfdb get <profile_id>
ctrlpkt appprofile add	Add a control packet profile to forward, drop, CPYCPU, RDTCPU and bypass protocol control packets based on port bitmap, Ethernet type bitmap, RFDB bitmap and protocol type	ctrlpkt appprofile add
ctrlpkt appprofile del	Delete a control packet profile entry	ctrlpkt appprofile del
ctrlpkt appprofile getfirst	Get the control packet profile first entry	ctrlpkt appprofile getfirst

Name	Function	Usage
ctrlpkt appprofile getnext	Get the control packet profile next entry	ctrlpkt appprofile getnext
ctrlpkt appprofile show	Show the whole control packet profile entries	ctrlpkt appprofile getfirst

5.2.22 Register access and debug

Name	Function	Usage
debug phy get	Read PHY register	debug phy get <ph_id> <reg_addr>
debug phy set	Write PHY register	debug phy set <ph_id> <reg_addr> <value>
debug reg get	Read switch register	debug reg get <reg_addr>
debug reg set	Write switch register	debug reg set <reg_addr> <value>
debug entry get	Read switch register entry	debug entry get <entry_name>
debug entry set	Write switch register entry	debug entry set <entry_name>
debug field get	Read switch register field	debug field get <field_name>
debug field set	Write switch register field	debug field set <field_name>
debug aclList dump	Dump all ACL lists	debug aclList dump
debug aclRule dump	Dump all ACL rules	debug aclRule dump

5.2.23 Set device ID

Name	Function	Usage
device id set	Set device ID	device id set <dev_id>