Quant

ELEVATING TECHNOLOGY

Managed Switch CLI Configuration Manual-RTL

Q-M-2800-16P-L2-4S	Q-M-2800-24P-L2-4S

(V2.1)

Chapter 1. System Status Commands

1.1. System information

1.1.1. show system

command description

View version information (device name, software and hardware version, mac address, compilation time, etc.) parameters

none

Default

none

command mode

Privileged Mode Example

none

Example

switch# show system

System Information and Running Status

Product Model :switch-8-2
Product MAC Address : 00-08-09-55-AA-80
Product Serial Number :
Software Version : V8.0
Software Released Date : 2022-11-22 18:32:51
Hardware Version :
Boot Version : MY_VERSION_BOOT
Kernel Version : Linux3.18.24#655
System Name :switch
System Location :switch
System Contact :switch
--

```
  Date And Time                : 1970-01-01 00:44:54
  Running Time                 : 13 Mins 36 Secs
  --
  CPU Usage                     : 5.4%
  Memory Usage                  : 25.5% (Total:126028 KBytes, Free:93808
KBytes)
  Nvram Usage                   : 3.1% (Total:262136 Bytes, Free:253760 Bytes)
  --
  Board Temperature            : 6553.5 C
```

1.2. System log

1.2.1. show syslog

command description

View the current log information of the switch

parameters

none

default

none

command mode

privileged mode

example

```
switch# show syslog

   Syslog Configuration
-----------------------------------------------------------------
  SysLog Status    : Enabled
  Log To Console : Disabled                    Level: 6
  Log To Cache     : Enabled                     Level: 6
-----------------------------------------------------------------
```

1.3. Port statistics

1.3.1. show interface

Command description View port packet statistics

parameters

```
show interface [PORTLIST]
   brief            Brief information
   dot1x             802.1x port configuration
```

```
  fdb              Fdb information
  gmrp             GMRP Configuration
  gvrp             GVRP Configuration
  qos              Qos information
  rateLimit        Qos rate limit
  sfp              sfp informations
  statistics       Statistic information
  stormFilter      Storm filter information
  switchport       switchPort informatio
```

PORTLIST: port list, supports forms such as Port1; default

None

command mode

privileged mode

Example

switch#show interface Port1 statistics

switch#show interface Port1-Port10 statistics

1.4. View LACP status

1.4.1. show link-aggregate

Command description View lacp system status parameters

none

default

None

command mode

privileged mode

example

```
switch(config)# show link-aggregate
  group     Link aggregation group
  system    Link-aggregation system informations
```

1.5. View STP status

1.5.1. show spanning-tree

command description

View spanning tree bridge status

parameters

None

default

none

command mode

Privileged mode

uses command mode

none

example

switch #show spanning-tree

1.6. View LLDP neighbors

1.6.1. show lldp

Command Description View lldp neighbor information parameters

None

default

None

command mode

privileged mode

example

switch(config)# interface Port1

switch(config-Port1)# show lldp

localSystem LLDP local system

remoteSystem LLDP remote system

1.7. View the Layer 2 forwarding table

1.7.1. show fdb

View Layer 2 Forwarding Table

parameters

none

default
None
command mode
privileged mode
example
switch(config)# show fdb
agingTime Aging-time
linkDownFastAging Link down fast aging
multicastDynamic Multicast-dynamic
multicastStatic Multicast-static
multicastTable Multicast-table
unicastStatic Unicast-static
unicastTable Unicast-table

1.8. View current configuration

1.8.1. show running-config

Command description View current configuration
default
None
command mode
privileged mode
example
switch#show running-config

1.9. View STP status

GSW# show interface Port1-Port2 brief

Port Name : Port1
Port Media : Copper
Shutdown : No
Auto Negotiation : Enabled
Force Duplex : Full
Force Speed : 1000Mbps
Flow Control : Off
Link Status : Down
Link Duplex : Half

```
   Link Speed                : 10Mbps
--------------------------------------------------

   Port Name                 : Port2
   Port Media                : Copper
   Shutdown                  : No
   Auto Negotiation          : Enabled
   Force Duplex              : Full
   Force Speed               : 1000Mbps
   Flow Control              : Off
   Link Status               : Down
   Link Duplex               : Half
   Link Speed                : 10Mbps
--------------------------------------------------
   Total 2 Ports listed

GSW#
```

1.10 show history

```
GSW# show history
  show gmrp
  show gvrp
GSW#
```

1.11 show radius-server

```
GSW# show radius-server

Radius server host: 192.168.1.16
Radius server port: 1812
Radius server key: 123456

GSW#
```

1.12. show static-route

```
GSW# show static-route
  Destination      Gateway          Genmask          Metric  Inused
-------------------------------------------------------------------
  0.0.0.0          192.168.1.1      0.0.0.0          0       Yes
-------------------------------------------------------------------
  Total 1 Static Route entry listed

GSW#
```

1.13.show syslog messages

```
SW#
SW#
SW#
SW# show syslog messages
ern.info 1970-01-01 02:02:54 swdaemon[60]: Administrator 'admin' signed in succ
ssfully from console@Console
ern.info 1970-01-01 02:02:22 swdaemon[60]: Port2 port status changed to link up
ern.info 1970-01-01 01:31:13 swdaemon[60]: Administator 'admin' exited from con
ole@Console: Accessed Timeout
ern.info 1970-01-01 01:21:34 swdaemon[60]: Administrator 'admin' signed in succ
ssfully from console@Console
ern.notice 1970-01-01 01:21:31 swdaemon[60]: Login is failed by user 'admin' fr
m console@Console : Incorrect User Password
ern.info 1970-01-01 01:17:49 swdaemon[60]: Administator 'admin' exited from con
ole@Console: Accessed Timeout
ern.info 1970-01-01 01:12:46 swdaemon[60]: Administrator 'admin' signed in succ
ssfully from console@Console
ern.info 1970-01-01 00:52:03 swdaemon[60]: Administator 'admin' exited from con
ole@Console: Accessed Timeout
ern.info 1970-01-01 00:47:03 swdaemon[60]: Administrator 'admin' signed in succ
ssfully from console@Console
ern.info 1970-01-01 00:45:31 swdaemon[60]: Port6 port status changed to link do
n
ern.info 1970-01-01 00:45:24 swdaemon[60]: Port6 port status changed to link up
ern.info 1970-01-01 00:27:08 swdaemon[60]: Port12 port status changed to link u

ern.info 1970-01-01 00:27:06 swdaemon[60]: Port12 port status changed to link d
wn
ern.info 1970-01-01 00:24:57 swdaemon[60]: Port12 port status changed to link u

ern.info 1970-01-01 00:24:54 swdaemon[60]: Port12 port status changed to link d
wn
ern.info 1970-01-01 00:22:57 swdaemon[60]: Port4 port status changed to link do
n
ern.info 1970-01-01 00:22:57 swdaemon[60]: Port1 port status changed to link do
n
ern.info 1970-01-01 00:21:24 swdaemon[60]: Port12 port status changed to link u

ern.info 1970-01-01 00:21:17 swdaemon[60]: Port12 port status changed to link d
wn
ern.info 1970-01-01 00:20:36 swdaemon[60]: Port12 port status changed to link u

ern.info 1970-01-01 00:20:33 swdaemon[60]: Port12 port status changed to link down
ern.info 1970-01-01 00:20:32 swdaemon[60]: Port12 port status changed to link up
ern.info 1970-01-01 00:20:29 swdaemon[60]: Port12 port status changed to link down
ern.info 1970-01-01 00:20:26 swdaemon[60]: Port12 port status changed to link up
ern.info 1970-01-01 00:20:24 swdaemon[60]: Port12 port status changed to link down
ern.info 1970-01-01 00:12:42 swdaemon[60]: Administator 'admin' exited from web-1@192.168.1.111: Accessed Tim
out
ern.info 1970-01-01 00:12:03 swdaemon[60]: Port12 port status changed to link up
ern.info 1970-01-01 00:11:53 swdaemon[60]: Port12 port status changed to link down
ern.info 1970-01-01 00:11:44 swdaemon[60]: Port12 port status changed to link up
ern.info 1970-01-01 00:11:42 swdaemon[60]: Port12 port status changed to link down
ern.info 1970-01-01 00:11:30 swdaemon[60]: Port12 port status changed to link up
ern.info 1970-01-01 00:11:26 swdaemon[60]: Port12 port status changed to link down
ern.info 1970-01-01 00:11:22 swdaemon[60]: Port12 port status changed to link up
ern.info 1970-01-01 00:11:11 swdaemon[60]: Port12 port status changed to link down
ern.info 1970-01-01 00:11:09 swdaemon[60]: Port12 port status changed to link up
```

1.14.show time

```
GSW# show time

  System Date and Time
------------------------------------------------------------------------
 System Time    : 1970-01-01 00:02:11
 Location       : (26)[+8:00]Beijing, Perth, Singapore, Hong Kong
------------------------------------------------------------------------

GSW#
```

1.15.show timeout

```
GSW# show timeout

  Access Timeout Parameters
-------------------------------------------------------
 Console  : 5  minutes
 Telnet   : 5  minutes
 SSH      : 5  minutes
 Web      : 5  minutes
-------------------------------------------------------

GSW#
```

1.16.show timezone-list

```
GSW# show timeout

  Access Timeout Parameters
-----------------------------------------------------
 Console   : 5  minutes
 Telnet    : 5  minutes
 SSH       : 5  minutes
 Web       : 5  minutes
-----------------------------------------------------

GSW# show timezone-list

  Supported Time Zone List
-------------------------------------------------------------------
 (1)[-12:00]Eniwetok, Kwajalein
 (2)[-11:00]Midway Island, Samoa
 (3)[-10:00]Hawaii
 (4)[-9:00]Alaska
 (5)[-8:00]Pacific Time (US & Canada)
 (6)[-7:00]Mountain Time (US & Canada)
 (7)[-6:00]Central Time (US & Canada), Mexico City
 (8)[-5:00]Eastern Time (US & Canada), Bogota, Lima
 (9)[-4:00]Atlantic Time (Canada), Caracas, La Paz
 (10)[-3:30]Newfoundland
 (11)[-3:00]Brazil, Buenos Aires, Georgetown
 (12)[-2:00]Mid-Atlantic
 (13)[-1:00]Azores, Cape Verde Islands
 (14)[+0:00]Western Europe Time, London, Lisbon, Casablanca
 (15)[+1:00]Brussels, Copenhagen, Madrid, Paris
 (16)[+2:00]Kaliningrad, South Africa
 (17)[+3:00]Baghdad, Riyadh, Moscow, St. Petersburg
 (18)[+3:30]Tehran
 (19)[+4:00]Abu Dhabi, Muscat, Baku, Tbilisi
 (20)[+4:30]Kabul
 (21)[+5:00]Ekaterinburg, Islamabad, Karachi, Tashkent
 (22)[+5:30]Bombay, Calcutta, Madras, New Delhi
 (23)[+5:45]Kathmandu
 (24)[+6:00]Almaty, Dhaka, Colombo
 (25)[+7:00]Bangkok, Hanoi, Jakarta
 (26)[+8:00]Beijing, Perth, Singapore, Hong Kong
 (27)[+9:00]Tokyo, Seoul, Osaka, Sapporo, Yakutsk
 (28)[+9:30]Adelaide, Darwin
 (29)[+10:00]Eastern Australia, Guam, Vladivostok
 (30)[+11:00]Magadan, Solomon Islands, New Caledonia
 (31)[+12:00]Auckland, Wellington, Fiji, Kamchatka
-------------------------------------------------------------------

GSW#
```

1.17.show arp

```
GSW# show arp

  IP Address       HW Address      Interface
-------------------------------------------------
  192.168.1.1      EC6073-321E22   ip0
-------------------------------------------------
  Total 1 ARP entry listed

GSW#
```

1.18.show cpu

```
GSW# show cpu

  CPU Status
-------------------------------------------------------
 CPU Usage                : 6.7%
-------------------------------------------------------

GSW#
```

1.19.GSW(config)# show spanning-tree

```
GSW# config
GSW(config)# show spanning-tree

 spanning tree informations
-----------------------------------------------------------
 Stp Mode        : rstp
 Bridge ID       : 207759-0CE7F5/32768
 Root Bridge     : 207759-0CE7F5/32768
 Root Path Cost  : 0
 Configured Times
 forwardDelay    helloTime    maxAge    txLimit
 ---------------------------------------------
 15              2            20        6

 Operational Times
 forwardDelay    helloTime    maxAge    messageAge
 ---------------------------------------------
 15              2            20        0

-----------------------------------------------------------

GSW(config)#
```

1.20.show gmrp global

```
GSW# show gmrp  global

 GMRP Global Configuration
  Status           : Disabled
  Hold Time        : 100 ms
  Join Time        : 200 ms
  Leave Time       : 600 ms
  LeaveAll Time    : 10000 ms
```

1.21.show gvrp global

```
GSW# show gvrp global

 GVRP Global Configuration
  Status           : Disabled
  Hold Time        : 100 ms
  Join Time        : 200 ms
  Leave Time       : 600 ms
  LeaveAll Time    : 10000 ms

GSW#
```

1.22.show gvrp global

1.20.(GSW)#list

```
GSW# list
  <4> clear
  <4> config
  <1> default factory
  <4> exit
  <4> help
  <4> list
  <4> ping DSTIP
  <4> quit
  <4> reset
  <4> show acl all
  <4> show acl index INDEXLIST
  <4> show acl name NAME
  <4> show alarm (settings|relay|light|trap)
  <4> show arp
  <4> show cpu
  <4> show dhcp-client
  <4> show dhcp-client6
  <3> show dot1x global
  <4> show fdb agingTime
  <4> show fdb linkDownFastAging
  <4> show fdb multicastDynamic
  <4> show fdb multicastDynamic vlan <1-4094>
  <4> show fdb multicastStatic
  <4> show fdb multicastStatic vlan <1-4094>
  <4> show fdb multicastTable
  <4> show fdb multicastTable vlan <1-4094>
  <4> show fdb unicastStatic
  <4> show fdb unicastStatic port PORT
  <4> show fdb unicastStatic vlan <1-4094>
  <4> show fdb unicastStatic vlan <1-4094> port PORT
  <4> show fdb unicastTable (all|dynamic|static)
  <4> show fdb unicastTable (all|dynamic|static) port PORT
  <4> show fdb unicastTable (all|dynamic|static) vlan <1-4094>
  <4> show fdb unicastTable (all|dynamic|static) vlan <1-4094> port PORT
  <4> show gmrp global
  <4> show gvrp global
  <4> show history
  <3> show igmpSnooping
  <3> show igmpSnooping ipGroups
  <3> show igmpSnooping ipGroups vlan VLANLIST
  <3> show igmpSnooping macGroups
  <3> show igmpSnooping macGroups vlan VLANLIST
  <3> show igmpSnooping vlanConfig VLANLIST
  <4> show interface PORTLIST brief
  <4> show interface PORTLIST dot1x
  <4> show interface PORTLIST fdb learnAbility
  <4> show interface PORTLIST gmrp portConfig
  <4> show interface PORTLIST gvrp portConfig
  <4> show interface PORTLIST qos
  <4> show interface PORTLIST qos (priority|policy|schedule)
  <4> show interface PORTLIST rateLimit
  <4> show interface PORTLIST sfp
```

```
  <4> show interface PORTLIST sfp
  <4> show interface PORTLIST statistics
  <4> show interface PORTLIST stormFilter
  <4> show interface PORTLIST switchport
  <4> show ip-interface
  <4> show mirror
  <4> show ntp
  <4> show qos mapping dot1p
  <4> show qos mapping dscp
  <4> show qos mapping priority
  <4> show radius-server
  <4> show route
  <4> show running-config
  <4> show snmp
  <4> show snmp v3 user
  <4> show startup-config
  <4> show static-route
  <4> show syslog
  <4> show syslog messages
  <4> show system
  <4> show time
  <4> show timeout
  <4> show timezone-list
  <4> show user
  <4> show vlan
  <4> show vlan VLANLIST
  <4> show vlan all
  <4> who
  <2> write
GSW#
```

1.21.GSW(config)#list

```
GSW(config)# list
  <4> acl index <0-999>
  <2> acl index <0-999> name NAME
  <4> acl index <1000-1999>
  <2> acl index <1000-1999> name NAME
  <4> acl index <2000-2999>
  <2> acl index <2000-2999> name NAME
  <4> acl index <3000-3999>
  <2> acl index <3000-3999> name NAME
  <4> acl name NAME
  <3> alarm light (linkDown|linkUp) interface PORTLIST (enable|disable)
  <3> alarm light (powerDown|highTemperature|lowTemperature) (enable|disable)
  <3> alarm powerDown (power1|power2) (enable|disable)
  <3> alarm relay (linkDown|linkUp) interface PORTLIST (enable|disable)
  <3> alarm relay (powerDown|highTemperature|lowTemperature) (enable|disable)
  <3> alarm snmpTrap (linkDown|linkUp) interface PORTLIST (enable|disable)
  <3> alarm snmpTrap (powerDown|highTemperature|lowTemperature) (enable|disable)
  <3> alarm temperature threshold (high|low) TEMP
  <4> clear
  <2> clear interface PORTLIST statistics
  <1> clear syslog messages
  <1> default factory
  <3> dhcpServer (enable|disable)
  <3> dhcpServer IPIFNAME (enable|disable)
  <3> dhcpServer IPIFNAME pool NAME
  <3> dhcpServer leaseTime <30-525600>
  <3> dhcpServer pool create NAME
  <3> dhcpServer pool enter NAME
  <3> dhcpSnooping (enable|disable)
  <3> dhcpSnooping information circuitID string STRING
  <3> dhcpSnooping information circuitID vlanPort
  <3> dhcpSnooping information enable
  <3> dhcpSnooping information remoteID (clientMac|switchMac)
  <3> dhcpSnooping information remoteID string STRING
  <3> dhcpSnooping information strategy (drop|keep|replace)
  <3> dot1x (reauth|quiet) enable
  <3> dot1x enable
  <3> dot1x method (eap|chap|pap)
  <3> dot1x timer (txPeriod|serverTimeout|overtime) <1-120>
  <3> dot1x timer quietPeriod <10-3600>
  <3> dot1x timer reauthPeriod <60-7200>
  <4> end
  <2> erps linkCheck (enable | disable)
  <2> erps majorRing <1-255> eastPort PORT westPort PORT protocolVlan <1-4094> nodeType rplNeighbour rpl (east
 | west)
  <2> erps majorRing <1-255> eastPort PORT westPort PORT protocolVlan <1-4094> nodeType rplOwner rpl (east | w
est)
  <2> erps majorRing <1-255> eastPort PORT westPort PORT protocolVlan <1-4094> nodeType transfer
  <2> erps ring RINGID clear command
  <2> erps ring RINGID force-switch (east | west)
  <2> erps ring RINGID guardTime <10-2000>
  <2> erps ring RINGID holdoffTime <0-10000>
  <2> erps ring RINGID manual-switch (east | west)
  <2> erps ring RINGID wtrTime <1-12>
  <2> erps subRing <1-255> (eastPort | westPort) PORT protocolVlan <1-4094> nodeType (transfer | rplOwner | rp
lNeighbour) majorRing <1-255>
```

1.22.show gmrp global

```
GSW# show gmrp global

 GMRP Global Configuration
  Status           : Disabled
  Hold Time        : 100 ms
  Join Time        : 200 ms
  Leave Time       : 600 ms
  LeaveAll Time    : 10000 ms

GSW#
```

1.23.show qos

```
GSW# show qos
  mapping  Qos mapping
GSW# show qos ma
GSW# show qos mapping
  dot1p     Qos dot1p
  dscp      Qos dscp
  priority  Qos priority
GSW# show qos mapping
```

1.24.qos mapping (dot1p, dscp, priority)

```
GSW# config
GSW(config)# qos
  mapping  Qos mapping
GSW(config)# qos ma
GSW(config)# qos mapping
  dot1p     Qos dot1p
  dscp      Qos dscp
  priority  Qos priority
GSW(config)# qos mapping
```

1.25.qos (policy , scheduleMode , weights)

```
GSW(config)# int all
GSW(config-portlist)# cu
GSW(config-portlist)# current

%  Current Configure Ports: Port1-Port28

GSW(config-portlist)# qos
  policy        Qos policy
  scheduleMode  Qos schedule mode
  weights       Qos weights
GSW(config-portlist)# qos
```

1.26.alarm (light , powerdown, relay, snmpTrap, temperature)

```
GSW#
GSW# al
GSW# al
% There is no matched command.
GSW# config
GSW(config)# al
GSW(config)# alarm
  light         Alarm action: light
  powerDown     Power Down alarm setting
  relay         Alarm action: relay
  snmpTrap      Alarm action: snmp trap
  temperature   Set temperature setting
GSW(config)# alarm lig
GSW(config)# alarm light
  linkDown          Interface link down alarm
  linkUp            Interface link up alarm
  powerDown         Power down alarm
  highTemperature   High temperature alarm
  lowTemperature    Low temperature alarm
GSW(config)# alarm light
```

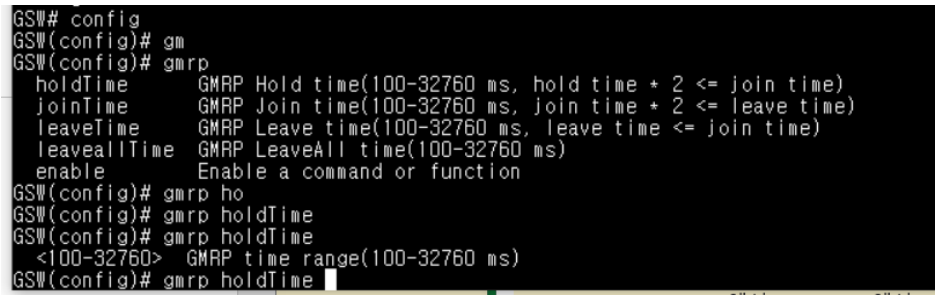
1.27.clear interface PORTLIST statistics

```
GSW# config
GSW(config)# cle
GSW(config)# clear
  interface  Interface information
  syslog     Syslog information
  <cr>
GSW(config)# clear in
GSW(config)# clear interface
all             cpu             Port1           Port2           Port3           Port4

Port5           Port6           Port7           Port8           Port9           Port10

Port11          Port12          Port13          Port14          Port15          Port16

Port17          Port18          Port19          Port20          Port21          Port22

Port23          Port24          Port25          Port26          Port27          Port28

GSW(config)# cle
GSW(config)# clear
  interface  Interface information
  syslog     Syslog information
  <cr>
GSW(config)# clear inter
GSW(config)# clear interface all
  statistics  Statistic information
GSW(config)# clear interface all stat
GSW(config)# clear interface all statistics
  <cr>
GSW(config)# clear interface all statistics
```

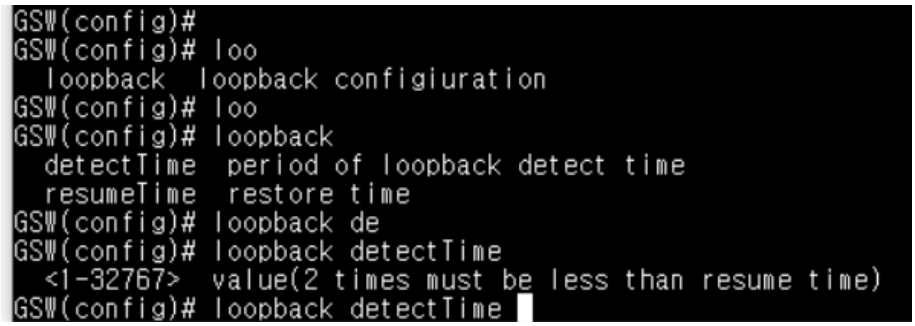
1.28.clear syslog messages

```
GSW(config)# end
GSW# config
GSW(config)# cle
GSW(config)# clear sys
GSW(config)# clear syslog
  messages  messages for syslog
GSW(config)# clear syslog me
GSW(config)# clear syslog messages
  <cr>
GSW(config)# clear syslog messages
```

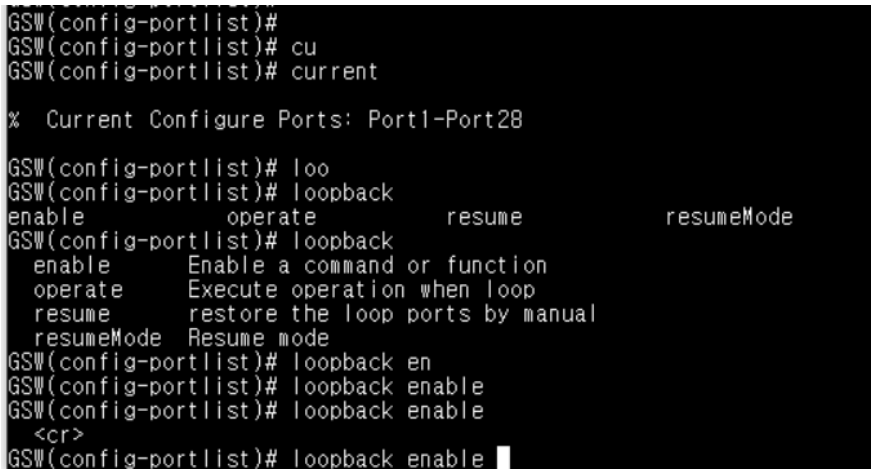
1.29.gmrp (holdtime, jointime, leavetime, leavealltime, enable)



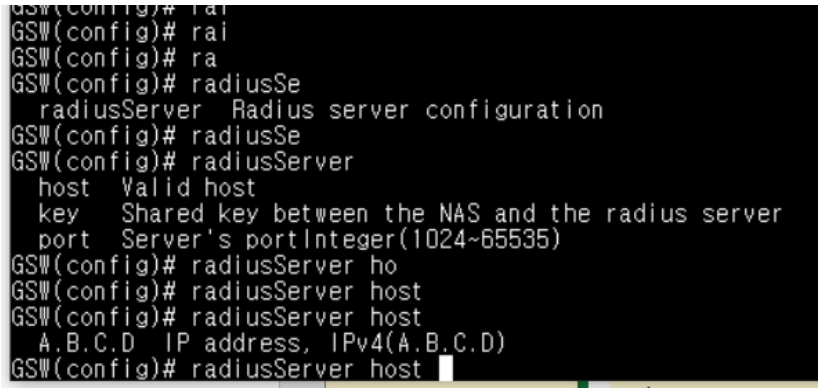
1.30.loopback (detectTime, resumeTime)



1.31.loopback (enable, operate, resume, resumeMode)



1.32.radius-server (host, key, port)



1.33.show alarm

1.34.GSW(config-portlist)# show spanning-tree

1.35.spanning-tree (forwardDelay , helloTime, maxAge, priority, txLimit)

```
GSW(config)#
GSW(config)#
GSW(config)# spa
GSW(config)# spanning-tree
forwardDelay     helloTime        maxAge           priority         txLimit
GSW(config)# spanning-tree
  forwardDelay  Stp forward delay timer
  helloTime     Stp hello timer
  maxAge        Stp bpdu max age
  priority      Stp bridge priority
  txLimit       Stp transit limit
GSW(config)# spanning-tree
```

1.36.spanning-tee (disable, enable, pathcost, priority)

```
GSW(config-portlist)#
GSW(config-portlist)# cu
GSW(config-portlist)# current

%  Current Configure Ports: Port1-Port28

GSW(config-portlist)# spa
GSW(config-portlist)# spanning-tree
  disable    Disable a function
  enable     Enable a command or function
  pathCost   Stp port path cost
  priority   Stp port priority
GSW(config-portlist)# spanning-tree
```

1.37.time (date , timeZone)

```
GSW(config)#
GSW(config)#
GSW(config)#
GSW(config)# time
  date      System Date
  timeZone  TimeZone
GSW(config)# t
  time      Set system date and time
  timeout   Access timeout management
GSW(config)# time
  date      System Date
  timeZone  TimeZone
GSW(config)# time
```

1.38.Timeout

```
GSW(config)#
GSW(config)#
GSW(config)# tim
  time      Set system date and time
  timeout   Access timeout management
GSW(config)# timeo
GSW(config)# timeout
  console   Login from console
  telnet    Login from telnet
  ssh       Login from SSH
  web       Login from web
GSW(config)# timeout
```

1.39.user set

```
  web       Login from web
GSW(config)# use
GSW(config)# user
  add   Add a parameter or attribute
  set   Set a parameter or attribute
GSW(config)# user
```

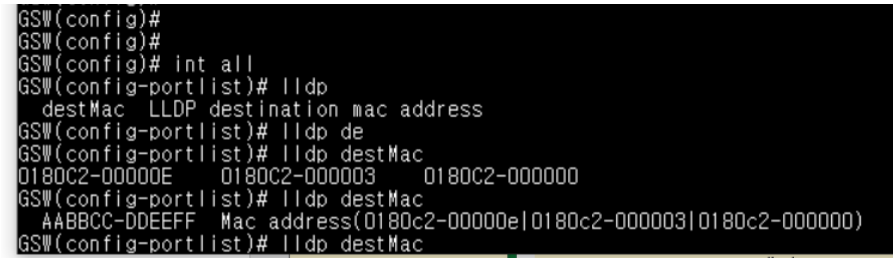
1.40.Current

```
GSW(config)#
GSW(config)#
GSW(config)#
GSW(config)# int all
GSW(config-portlist)# cu
GSW(config-portlist)# curr
  current   Show current Ports in configuration
GSW(config-portlist)# curr
GSW(config-portlist)# current
  <cr>
GSW(config-portlist)# current

%  Current Configure Ports: Port1-Port28

GSW(config-portlist)#
```

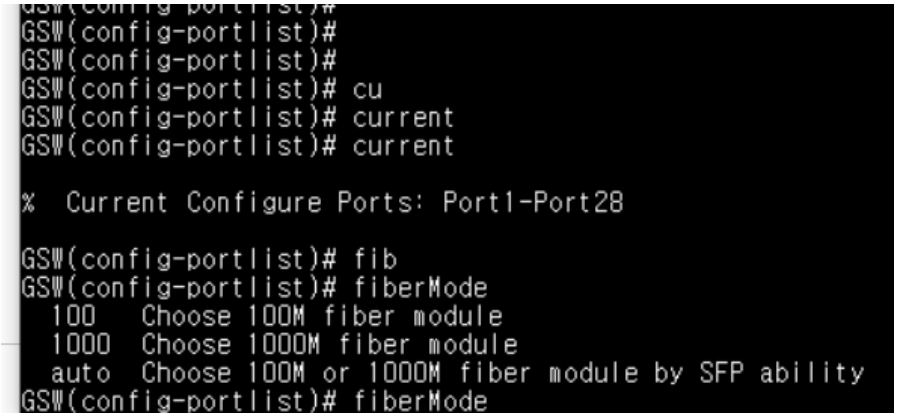
1.41.Eee

```
GSW#
GSW#
GSW# config
GSW(config)# e
  end    End current mode and change to enable mode.
  erps   ERPS information
  exit   Exit current mode and down to previous mode
GSW(config)# int all
GSW(config-portlist)# e
  eee    EEEenable EEEDisable EEE
  end    End current mode and change to enable mode.
  exit   Exit current mode and down to previous mode
GSW(config-portlist)# eee
GSW(config-portlist)# eee
  disable
  enable
GSW(config-portlist)# eee
```

1.42.lldp destMac



1.43.fiberMode (100, 1000, auto)



1.44.ratelimit (both, ingress, egress)

```
GSW#
GSW#
GSW# config
GSW(config)# int all
GSW(config-portlist)# ra
  rateLimit  Qos rate limit
GSW(config-portlist)# ra
GSW(config-portlist)# rateLimit
  both     Both ingress and egress
  ingress  Ingress
  egress   Egress
GSW(config-portlist)# rateLimit
```

1.45.show ratelimit

```
GSW(config)#
GSW(config)#
GSW(config)# int all
GSW(config-portlist)# show ra
  radius-server  Radius server configuration
  rateLimit      Qos rate limit
GSW(config-portlist)# show ra
radius-server    rateLimit
GSW(config-portlist)# show rate
GSW(config-portlist)# show rateLimit
  <cr>
GSW(config-portlist)# show rateLimit
```

1.46.show brief

```
GSW(config)#
GSW(config)#
GSW(config)# int all
GSW(config-portlist)#
GSW(config-portlist)#
GSW(config-portlist)# cu
GSW(config-portlist)# current

%  Current Configure Ports: Port1-Port28

GSW(config-portlist)# show br
GSW(config-portlist)# show brief

  Port Name            : Port1
  Port Media           : Copper
  Shutdown             : No
  Auto Negotiation     : Enabled
  Force Duplex         : Full
  Force Speed          : 1000Mbps
  Flow Control         : Off
  Link Status          : Down
  Link Duplex          : Half
  Link Speed           : 10Mbps
-------------------------------------------------
```

1.47.show current

```
GSW(config-portlist)# end
GSW# show cu
GSW# config
GSW(config)# show cu
GSW(config)#
GSW(config)#
GSW(config)#
GSW(config)#
GSW(config)# int all
GSW(config-portlist)# show cu
GSW(config-portlist)# show current

interface Port1
 no shutdown
 duplex auto
 speed auto
 flowControl off
 eee disable
 priority 0
 no qos policy
 qos scheduleMode sp
 qos weights 1 3 5 7 11 25 31 44
```

1.48.show sfp

```
GSW#
GSW#
GSW#
GSW# config
GSW(config)# int all
GSW(config-portlist)# showsf
% There is no matched command.
GSW(config-portlist)# show sf
  sfp  Configuration for current objects
GSW(config-portlist)# show sfp
  <cr>
```

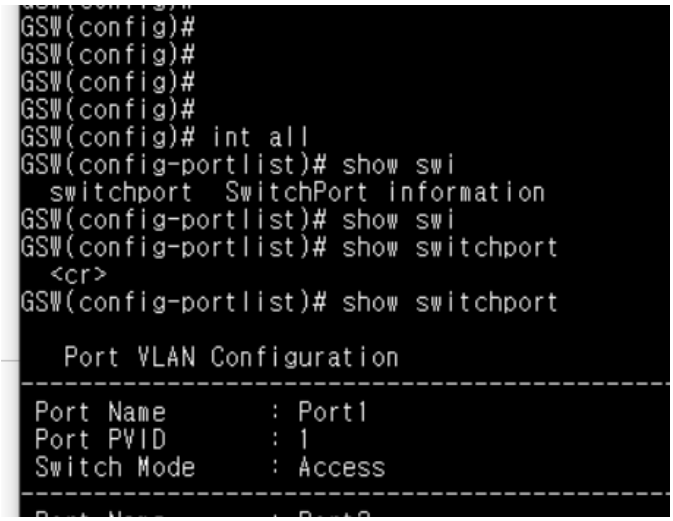
1.49.show statistics

```
GSW# config
GSW(config)#
GSW(config)#
GSW(config)# int all
GSW(config-portlist)# show statis
GSW(config-portlist)# show statisti
  statistics  Statistic information
GSW(config-portlist)# show statisti
GSW(config-portlist)# show statistics

  Port Name                 : Port1
  Rx Bytes                  : 0
  Rx Packets                : 0
  Rx Unicast Packets        : 0
  Rx Multicast Packets      : 0
  Rx Broadcast Packets      : 0
  Tx Bytes                  : 0
  Tx Packets                : 0
  Tx Unicast Packets        : 0
```

1.50.show stormFilter

```
GSW(config)#
GSW(config)#
GSW(config)#
GSW(config)# show sto
GSW(config)# int all
GSW(config-portlist)# show sto
GSW(config-portlist)# show stormFilter
GSW(config-portlist)# show stormFilt
  stormFilter  Storm filter information
GSW(config-portlist)# show stormFilt
GSW(config-portlist)# show stormFilter

  Port Name                 : Port1
  Unknown Unicast Stream    : Disabled
  Unknown Multicast Stream  : Disabled
  Broadcast Stream          : 64Kbps
----------------------------------------

  Port Name                 : Port2
```

1.51.show switchport



Chapter 2. System Setting Commands

2.1. IP configuration

The IP configuration commands are:

ip-interface ip0

show ip interface brief

2.1.1. IP address

command description

address, configure the switch interface management ip

no address A.B.C.D/E, means to delete the interface ip

parameter none

port enabled by default

command mode vlan interface configuration mode example

switch(config)# ip-interface ip0

switch(config-ip0)#address 192.168.2.1/24

2.1.2.dhcpClient

Command description dhcpClient, configure the management ip (vlan1) of the switch to obtain automatically (the dhcp server in the network will assign a dynamic ip to the vlan 1 interface of the switch)

no dhcpClient, means to disable management ip dhcp allocation, that is, manual static configuration mode parameter
None
port enabled by default
command mode in vlan interface configuration mode
Example

switch(config)# ip-interface ip0
switch(config-ip0)#dhcpClient

2.1.3.show ip-interface
Command description View the ip configuration of the interface
parameter none
port enabled by default
Command mode Privileged mode
Example

switch#show ip-interface

2.1.4. Log configuration
The log configuration commands are:

cache	Log to cache file
console	Log to console
enable	Enable syslog
host	Log to romote host

2.1.4.1.syslog enable
command description
syslog enable, open the log server mode
no syslog enable, disable syslog server mode parameter
None
Default
None
command pattern
glob pattern

Example
switch(config)#
switch(config)#no syslog enable

2.1.4.2. syslog host

Command description Configure the log server ip address;
parameters
Hostname // is the log server domain name or ip address
default None
command pattern
glob pattern
Example
switch(config)#syslog host 192.168.0.1

2.1.4.3.syslog console enable level
command description
Configure the log level of the upload log server;
parameters
<0-7> Set a level <0-7>
default
none
command mode
global pattern
Example
switch(config)#syslog console enable level 0

2.1.4.4.syslog cache enable level
command description
Configure the log level of the upload log server;
parameters
<0-7> Set a level <0-7>
default
none
command mode
global pattern
Example
switch(config)#syslog console enable level 0

2.1.5. User Configuration
The user configuration commands are:
user add name
show users
Note: name means user name, up to 18 characters are supported; password means password, up to 18 characters are supported; level <1-4>

2.1.5.1. username name

command description
user add name NAME password PASSWORD level

Add a new user or modify the password of an existing user or modify the administrative authority of an existing user, or modify the password and administrative authority of an existing user;
level indicates the user level, and the legal value is 1-4 (1 is the lowest management authority, 4 is the highest management authority); no user name NAME means to delete a known user;

parameters
none
default
none
command mode
global pattern
Example

switch(config)# user add name test password test level 4
//New user: test, password: test, authority: highest management authority;
switch(config)#no user name test

2.1.5.2. show user

Command description View all current user configuration information of the switch;
parameters

None

default
none
command mode
privileged mode
Example

switch #show user
switch#show running-config //This command can also view all user accounts

2.1.5.3. hostname

Example:

sw2(config)# snmp sysname sw2

2.2. NTP configuration

The ntp configuration commands are:

ntp enable

ntp serverIp

show ntp

2.2.1.ntp

Command description ntp, enable ntp function;

no ntp, disable ntp function;

parameter no default

no command mode

global pattern

Example

switch(config)# ntp

switch(config)# no ntp

2.2.2.ntp serverIP

command description

ntp serveIp { <ipv4_var> }

Configure ntp server address or domain name

no ntp serverIp , delete an ntp server address parameter

none

default

no command mode

switch(config)# ntp serverIp 1.1.1.1

2.2.3. show ntp

command description

View ntp server configuration information parameters

no default

no command mode

privileged mode

example

switch(config)#show ntp

Chapter 3. Port Configuration Commands

3.1. Port configuration

The port configuration commands are:

duplex speed
flowcontrol
shutdown

3.1.1. duplex

command description

duplex {auto|full|half}
no duplex

Set the duplex mode of the port. Note: If there is no special requirement, please do not change the port rate mode at will. The mismatch of the negotiation problem will affect the normal communication of the port.

Parameter

Parameter	Parameter Command Mode
auto	Auto-negotiation
full	full duplex
half	half duplex

Default All ports default to auto, and the duplex mode of the optical port is a fixed full duplex mode.

command mode

interface configuration mode

Example

switch(config)# interface Port1
switch(config-if)# duplex full
switch(config-if)# no duplex full

3.1.2.speed

command description

speed {10 | 100 | 1000 | 10000 | auto }, set the port speed no speed

Parameter

Parameter	Parameter Command Mode
10 | 100 | 1000 | 10000	Set the port rate to 10M, 100M, 1000M, 10000Mbps
Auto	Set port speed auto-negotiation.

Default Copper port defaults to auto-negotiation, optical port Gigabit self-adaptation, 10G port is forced to 10000M;

command mode

interface configuration mode

Note: The speed of the optical interface is mandatory 1000M and mandatory 10000M.

Ethernet port can be set to auto, 10M, 100M, 1000M
Example
switch(config)# interface Port1
switch(config-if)# speed 1000

3.1.3. flowcontrol

command description
flowcontrol on/off, open and close the port flow control function
parameter none
default
The flow control function is not enabled by default, and the Gigabit optical port does not support flow control configuration
command mode
interface configuration mode
Example
switch(config-if)#flowcontrol on
switch(config-if)# flowcontrol off

3.1.4. shutdown

Command description shutdown, close the port
no shutdown, open the port
parameter none
default
The port is enabled by default
command mode
interface configuration mode
Example
switch(config-if)# no shutdown

3.1.5. POE

Command description
poe mode at,enable 30w
poe mode af,enable 15.4w
no poe mode
show poe interface
Example
switch(config-if)# poe mode af
switch(config-if)# poe mode at
switch(config-if)# no poe mode
switch#show poe interface

3.2. Port mirroring

All commands
mirror destPort PORT
mirror enable
mirror sourcePortlist add (both|ingress|egress) PORTLIST
mirror sourcePortlist set (both|ingress|egress) PORTLIST
no mirror
no mirror sourcePortlist (both|ingress|egress) PORTLIST
show mirror
Example

```
switch(config)# mirror enable
switch(config)#   mirror sourcePortlist add   both Port1
switch(config)#   show mirror
```

Chapter 4. Advanced Configuration Commands

4.1. Link Aggregation

The configuration commands are:
Global pattern
link-aggregate algorithm ALGORITHM
link-aggregate group <1-8> mode (manual|static)
link-aggregate systemPriority <0-65535>

switch(config)# link-aggregate group 1 mode   manual
switch(config)# link-aggregate group 1 mode   static
Interface mode
lacp (enable|disable)
lacp activeMode (active|passive)
lacp adminKey <0-65535>
lacp priority <0-65535>
link-aggregate group <1-8>
no link-aggregate group
Example
Lacp

```
switch(config)# interface Port1
switch(config-Port1)# link-aggregate group 1
```

switch(config-Port1)# lacp enable
Static
switch(config)# interface Port1

switch(config-Port1)# link-aggregate group 1

4.2. VLAN management

The vlan configuration commands are:
Global pattern
vlan VLANLIST
vlan VLANLIST name NAME
no vlan VLANLIST

Interface mode
switchport hybrid (taggedVlan|untaggedVlan) VLANLIST
switchport hybrid (taggedVlan|untaggedVlan) add VLANLIST
switchport hybrid (taggedVlan|untaggedVlan) remove VLANLIST
switchport mode (access|trunk|hybrid)
switchport pvid <1-4094>
switchport trunk permitted Vlan VLANLIST
switchport trunk permitted Vlan add VLANLIST
switchport trunk permitted Vlan all
switchport trunk permitted Vlan remove VLANLIST

View VLAN:
show vlan
show vlan VLANLIST
show vlan all

Example
switch(config)# vlan 10

switch(config)# vlan 20

switch(config)# interface Port1

switch(config-Port1)# switchport trunk permitted Vlan all

switch(config-Port1)# show vlan

4MITECH(config-Port5)# switchport mode access

4MITECH(config-Port5)# switchport pvid 10

4.3.DHCP snooping configuration

DHCP snooping configuration commands are:
Global mode:
dhcpSnooping (enable|disable), turn on and off dhcpSnooping
dhcpSnooping information circuitID string STRING, configure circuitID name
dhcpSnooping information circuitID vlanPort, configure the vlanPort of circuitID
dhcpSnooping information enable, open option 82
dhcpSnooping information remoteID (clientMac|switchMac), configure remoteID mode
dhcpSnooping information remoteID string STRING, configure remoteID as string mode
dhcpSnooping information strategy (drop|keep|replace), configuration
no dhcpSnooping information, turn off option 82
interface mode
dhcpSnooping (circuitID|remoteID) STRING
dhcpSnooping trust
no dhcpSnooping (circuitID|remoteID)
no dhcpSnooping trust
check dhcp
show dhcpSnooping
show dhcpSnooping binding
Example
switch(config)# interface Port1
switch(config-Port1)# dhcpSnooping trust
switch(config-Port1)# show dhcpSnooping

4.4.DHCP Server configuration

DHCP Server configuration commands are:
In global mode:
dhcpServer (enable|disable), enable dhcp service disable dhcp service
dhcpServer IPIFNAME (enable|disable), enable/disable new dhcp address pool name
dhcpServer IPIFNAME pool NAME, add dhcp address pool name
dhcpServer leaseTime <30-525600>, dhcpServer time
dhcpServer pool create NAME, create pool name
dhcpServer pool enter NAME, modify the pool name
no dhcpServer IPIFNAME pool, delete the pool name of dhcpServer

no dhcpServer leaseTime, delete dhcpServer release time
no dhcpServer pool NAME, delete dhcpServer pool name
show dhcpServer, view DHCP-SERVER
Example:

```
switch# show dhcp-client
DHCP Client on primary IP Interface
DHCP Client on primary IP Interface
-------------------------------------------
 Status              : Success
 IP Address          : 192.168.6.101/24
 Lease               : 2 Hours 0 Min 0 Sec
 Lease Abtained : 1970-01-01 04:46:29
 Lease Expires    : 1970-01-01 06:46:29
switch(config)# show dhcpServer

  DHCP Server configuration informations
-----------------------------------------------------------------------------------------------
 DHCP server status          : Disabled
 Lease times                 : 30 minutes

  Name          Status              Bound pool
-------------------------------------------------
  ip0           Disabled            --
-------------------------------------------------
  Total 1 DHCP server interface listed

-----------------------------------------------------------------------------------------------

switch(config)#
```

4.5. IGMP Snooping configuration

Global mode:
The commands for igmp-snooping configuration are:
igmpSnooping enable, open igmpSnooping
igmpSnooping hostPort agingTime <60-600>, configure host aging time
igmpSnooping routerPort agingTime <30-300>, configure routing port aging time
igmpSnooping vlan VLANLIST, configure vlan multicast
igmpSnooping vlan VLANLIST fastLeave, configure fast leave
igmpSnooping vlan VLANLIST queryer enable, open query time
igmpSnooping vlan VLANLIST querier interval <30-120>, configure query

interval time
igmpSnooping vlan VLANLIST queryer sourceIp A.B.C.D, configure query address
igmpSnooping vlan VLANLIST staticRouterPort PORTLIST, configure static routing port
show igmpSnooping, displays igmpSnooping entries.
show igmpSnooping ipGroups, displays igmpSnooping IP group entries.
show igmpSnooping ipGroups vlan VLANLIST, display vlan multicast groups
show igmpSnooping macGroups, display multicast mac groups
show igmpSnooping macGroups vlan VLANLIST, display mac multicast groups
show igmpSnooping routerPort, display routing port
show igmpSnooping routerPort vlan VLANLIST, display routing port vlanlist
show igmpSnooping vlanConfig VLANLIST, display igmp vlan configuration

4.6. Routing configuration

The commands for routing configuration are:
show route displays the current routing table
route add default gateway A.B.C.D Add a default route
route add network A.B.C.D/M gateway A.B.C.D add static route
route set default gateway A.B.C.D modify the default route
route set default metric <0-9999> modify the default metric value
route set network A.B.C.D/M gateway A.B.C.D to modify the static route
route set network A.B.C.D/M metric <0-9999> Modify the metric value of the static route

Chapter 5. Network Security Commands

5.1.MAC address table

MAC address table display commands are (privileged mode):
show fdb agingTime
show fdb linkDownFastAging
show fdb multicastDynamic
show fdb multicastDynamic vlan <1-4094>
show fdb multicast Static
show fdb multicastStatic vlan <1-4094>
show fdb multicastTable
show fdb multicastTable vlan <1-4094>
show fdb unicast Static
show fdb unicast Static port PORT

show fdb unicastStatic vlan <1-4094>
show fdb unicastStatic vlan <1-4094> port PORT
show fdb unicastTable (all|dynamic|static)
show fdb unicastTable (all|dynamic|static) port PORT
show fdb unicastTable (all|dynamic|static) vlan <1-4094>
show fdb unicastTable (all|dynamic|static) vlan <1-4094> port PORT
MAC address table configuration commands include (global mode):
fdb agingTime <1-86400>
fdb agingTime disable
fdb clear (dynamic|static|all)
fdb linkDownFastAging enable
fdb multicastStatic mac AABBCC-DDEEFF vlan <1-4094> portlist PORTLIST
fdb unicastStatic mac AABBCC-DDEEFF vlan <1-4094> port PORT
MAC address table configuration commands include (interface mode):
fdb learnAbility amount <1-8192>
fdb learnAbility disable

5.2. Storm suppression

Display commands are (privileged mode):
show interface PORTLIST stormFilter
The configuration commands are (interface mode):
stormFilter (all|unknownUnicast|unknownMulticast|broadcast) rate <16-1000000>

Example

switch(config-Port1)# stormFilter broadcast rate 8000

5.3. ACL configuration

Display commands are (privileged mode):
show acl all
show acl index INDEXLIST
show acl name NAME
Global mode configuration command:
acl index <0-999>
acl index <0-999> name NAME
acl index <1000-1999>
acl index <1000-1999> name NAME

acl index <2000-2999>
acl index <2000-2999> name NAME
acl index <3000-3999>
acl index <3000-3999> name NAME
acl name NAME

Example

1. The configuration is

rejected as follows,

switch(config)# acl index

1000 name acl1000

switch(config)# acl index

1000

switch(config-acl-1000)#

switch(config)#acl index 1

name 1

switch(config)#acl index 1

switch(config-acl-1)#ports

set Port1

switch(config-acl-1)#rule

set 1 action permit

switch(config-acl-1)#rule

set 1 match srcMac

000000-000001 mask

FFFFFF-FFFFFF

switch(config-acl-1)#rule

set 2 action drop

switch(config-acl-1)#rule

set 2 match srcMac any

2 The configuration is

rejected as follows,

switch(config)#acl index 1

name 1

switch(config)#acl index 1

switch(config-acl-1)ports

set Port1

switch(config-acl-1)rule

set 1 action drop

switch(config-acl-1)rule

set 1 match srcMac

000000-000001 mask

FFFFFF-FFFFFF

5.4. STP configuration

The configuration commands under the interface are:
interface PORTLIST spanning-tree (enable | disable)
interface PORTLIST spanning-tree pathCost <0-200000000>
interface PORTLIST spanning-tree pathCost auto
interface PORTLIST spanning-tree priority <0-240>

5.5. Loop protection configuration

The commands for loop protection configuration are (under the interface):
interface PORTLIST loopback enable
interface PORTLIST loopback operate (shutdown|block)
interface PORTLIST loopback resume
interface PORTLIST loopback resumeMode (automation|manual)

5.6. ERPS configuration

ERPS show command has (global mode)
show erps linkCheck
show erps ring RINGID brief
show erps ring RINGID status
show erps ring all brief
show erps ring all status
ERPS configuration commands are (global mode):
erps linkCheck (enable | disable)
erps majorRing <1-255> eastPort PORT westPort PORT protocolVlan <1-4094>
nodeType rplNeighbour rpl (east | west)
erps majorRing <1-255> eastPort PORT westPort PORT protocolVlan <1-4094>
nodeType rplOwner rpl (east | west)
erps majorRing <1-255> eastPort PORT westPort PORT protocolVlan <1-4094>
nodeType transfer
erps ring RINGID clear command
erps ring RINGID force-switch (east | west)
erps ring RINGID guardTime <10-2000>
erps ring RINGID holdoffTime <0-10000>

erps ring RINGID manual-switch (east | west)
erps ring RINGID wtrTime <1-12>
erps subRing <1-255> (eastPort | westPort) PORT protocolVlan <1-4094> nodeType (transfer | rplOwner | rplNeighbour) majorRing <1-255>
erps subRing <1-255> eastPort PORT westPort PORT protocolVlan <1-4094> nodeType rplNeighbour rpl (east | west)
erps subRing <1-255> eastPort PORT westPort PORT protocolVlan <1-4094> nodeType rplOwner rpl (east | west)
erps subRing <1-255> eastPort PORT westPort PORT protocolVlan <1-4094> nodeType transfer

Note: ERPS command configuration is relatively complicated, it is recommended to use web configuration, easy to understand and easy to configure

5.7. QoS configuration

Example of Port Speed Limit

switch(config-Port1)#rateLimit ingress rate 16

switch(config-Port1)#rateLimit egress rate 16

802.1p priority mapping to local priority

switch(config)# qos mapping dot1p 0 to priority 1

DSCP priority mapping to local priority

switch(config)# qos mapping dscp 0 to priority 7

Local priority mapping to queue

switch(config)# qos mapping priority 0 to queue 7

switch(config)# interface Port1

```
switch(config-Port1)# # priority 7

 switch(config-Port1)# qos policy cos

 switch(config-Port1)# qos scheduleMode wrr

 switch(config-Port1)# qos weights 1 3 5 7 11 25 31 44
```

Chapter 6. Network Management Commands

6.1. LLDP configuration

LLDP show command (global mode):
show lldp
  show lldp localSystem
   show lldp remoteSystem
The LLDP configuration commands are (global mode):
                lldp (enable|disable)
   lldp creditNum <1-100>
   lldp fastInterval <1-3600>
  lldp fastNum <1-8>
  lldp holdMultiplier <2-10>
   lldp reinitDelay <1-10>
   lldp transmitInterval <5-32768>
  lldp trapInterval <5-3600>

6.2.802.1X configuration

The 802.1x display commands are (privileged mode):
show dot1x global
The 802.1x configuration commands are (global mode):
dot1x (reauth|quiet) enable
dot1x enable
dot1x method (eap|chap|pap)
dot1x timer (txPeriod|serverTimeout|overtime) <1-120>
dot1x timer quietPeriod <10-3600>
dot1x timer reauthPeriod <60-7200>
The 802.1x configuration commands are (interface mode):
dot1x control (auto|forceAuthorized|forceUnauthorized)

dot1x enable
dot1x mode (portbased|macbased)
dot1x supportHost <1-8>

Note: To use the 802.1x function, the stp function of the port needs to be closed

6.3. SNMP configuration

SNMP display commands are (privileged mode):
show snmp
show snmp v3 user
SNMP configuration commands are (global mode):
snmp community add NAME type (read-only|read-write)
snmp community del <3-8>
snmp community set <1-2> NAME
snmp community set <3-8> NAME type (read-only|read-write)
snmp enable
snmp port <1-65535>
snmp syscontact CONTACT
snmp syslocation LOCATION
snmp sysname NAME
snmp trap add host A.B.C.D port <1-65535> community NAME
snmp trap authfailed (enable|disable)
snmp trap defaultCommunity COMMUNITY
snmp trap del <2-4>
snmp trap enable
snmp trap set <1-4> host A.B.C.D port <1-65535> community NAME
snmp v3 user add username USERNAME usertype (read-only|read-write) securitylevel authNoPriv authtype (md5|sha) authpasswd PASSWORD
snmp v3 user add username USERNAME usertype (read-only|read-write) securitylevel authPriv authtype (md5|sha) authpasswd PASSWORD privtype (des|aes) privpasswd PASSWORD
snmp v3 user add username USERNAME usertype (read-only|read-write) securitylevel noAuthNoPriv
snmp v3 user del all
snmp v3 user del username USERNAME
snmp v3 user set username USERNAME usertype (read-only|read-write) securitylevel authNoPriv authtype (md5|sha) authpasswd PASSWORD
snmp v3 user set username USERNAME usertype (read-only|read-write) securitylevel authPriv authtype (md5|sha) authpasswd PASSWORD privtype (des|aes) privpasswd PASSWORD

snmp v3 user set username USERNAME usertype (read-only|read-write) securitylevel noAuthNoPriv

GSW# config
GSW(config)# snmp sysname switch
switch(config)#

Chapter 7. System Maintenance Commands

7.1. Device restart

The device restart command is:
GSW# reset
Are you sure you want to reset the system? Y/[N]

7.2. Save command

GSW# write
Are you sure you want to write the running configuration? Y/[N]
Write running configuration...ok

GSW#

7.3. Restore factory settings

The commands to restore the factory configuration are:
GSW# default factory
Are you sure you want to restore the default configuration? Y/[N]

7.4.ping test

The ping test commands are:
ping ip
GSW# ping 192.168.1.1
PING 192.168.1.1 (192.168.1.1): 56 data bytes
ping: sendto: Network is unreachable