

User Manual

Command Line Interface

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WoMaster

WoMaster Command Line Interface User Manual

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About This Manual

This user manual is intended to guide a professional installer to configure the device through Command Line Interface. It includes procedures to assist you in avoiding unforeseen problems.



NOTE:

Only qualified and trained personnel should be involved with installation, inspection, and repairs of this switch.

Disclaimer

WoMaster reserves the right to make changes to this Manual or to the product hardware at any time without notice. Information provided here is intended to be accurate and reliable. However, it might not cover all details and variations in the equipment and does not claim to provide for every possible contingency met in the process of installation, operation, or maintenance. Should further information be required or should particular problem arise which are not covered sufficiently for the user's purposes, the matter should be referred to WoMaster. Users must be aware that updates and amendments will be made from time to time to add new information and/or correct possible unintentional technical or typographical mistakes. It is the user's responsibility to determine whether there have been any such updates or amendments of the Manual. WoMaster assumes no responsibility for its use by the third parties.

WoMaster Online Technical Services

At WoMaster, you can use the online service forms to request the support. The submitted forms are stored in server for WoMaster team member to assign tasks and monitor the status of your service. Please feel free to write to help@womaster.eu if you encounter any problems.

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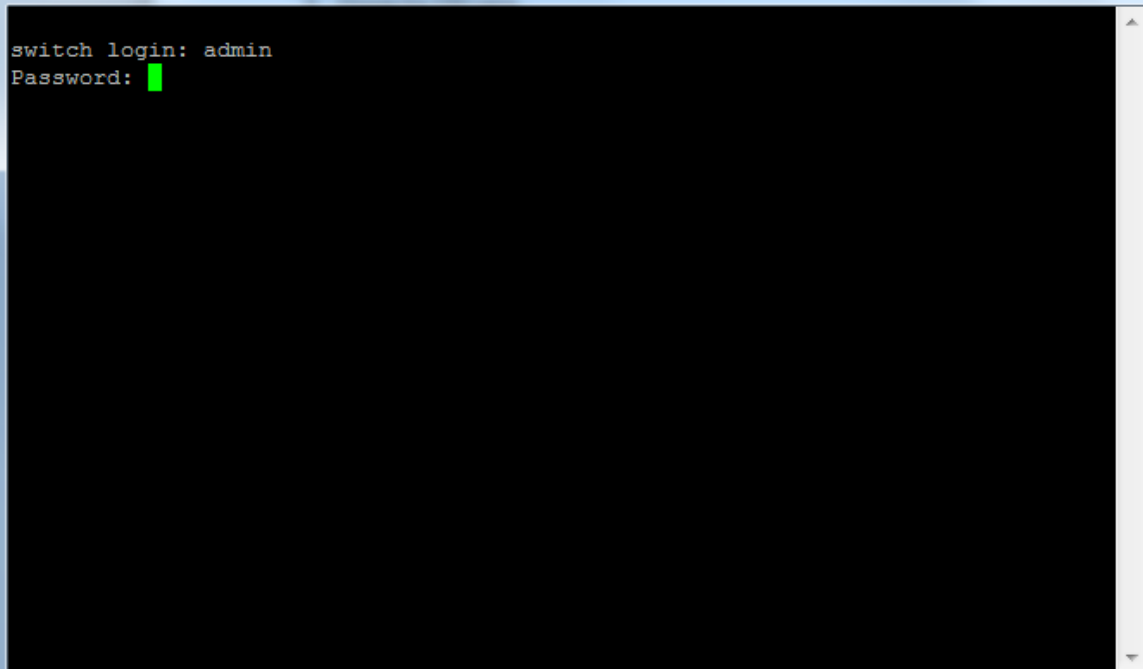
1. COMMAND LINE INTERFACE (CLI) INTRODUCTION

The Command Line Interface (CLI) is the user interface to the switch's embedded software system. The CLI in WoMaster switches can be accessed through either the serial console or Telnet console. The explanation for Serial and Telnet console preparation would be explained below:

1.1 PREPARATION FOR SERIAL CONSOLE

Attach RJ-45 to RS-232 DB-9 console cable to PC's COM port; connect RJ45 connector to the Console port of the WoMaster Managed Switch.

1. Go to Start -> Program -> Accessories -> Communication -> Hyper Terminal
2. Give a name to the new console connection.
3. Choose the COM name
4. Select correct serial settings. The serial settings of **WoMaster Managed switches** are as below:
Baud Rate: 115200 / Parity: None / Data Bit: 8 / Stop Bit: 1
5. After connected, switch login screen can be seen.



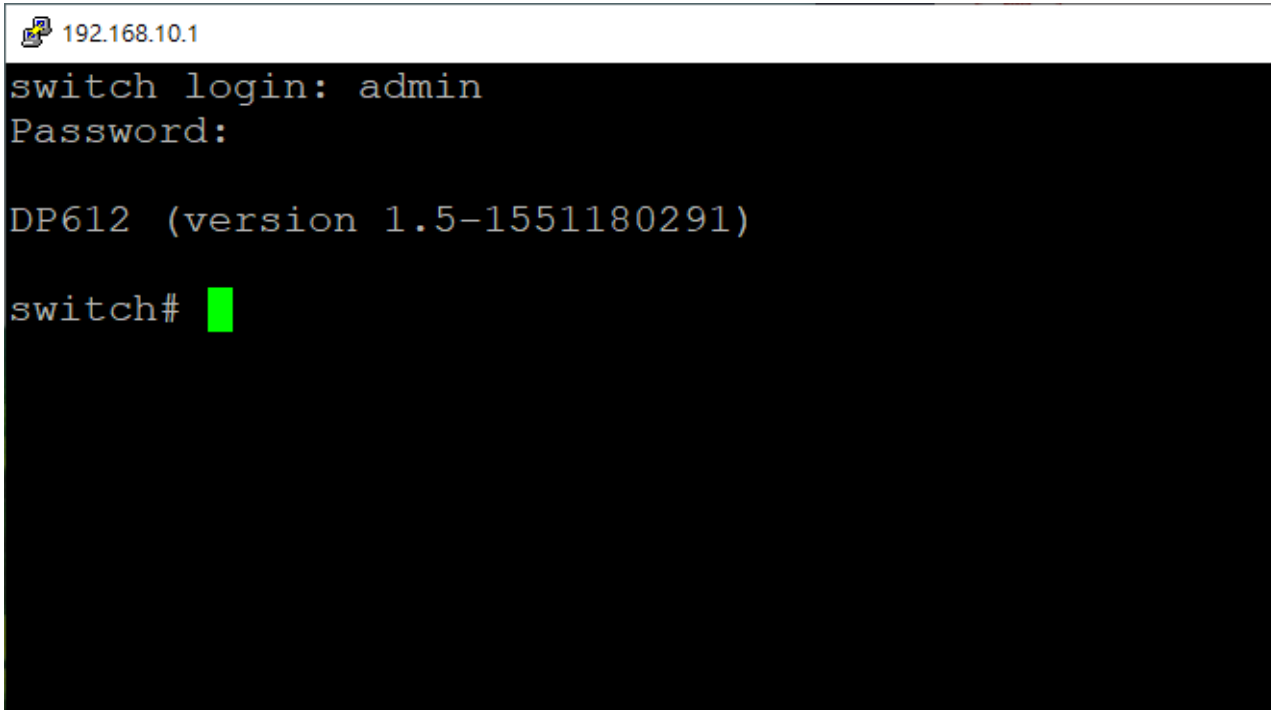
```
switch login: admin
Password: █
```

6. Login the switch. The default username: **admin**; password: **admin**.

1.2 PREPARATION FOR TELNET CONSOLE

WoMaster managed switch supports Telnet console. User can connect to the switch by Telnet and the command lines are the same as what user sees by RS232 console port. Below are the steps to open Telnet connection to the switch.

1. Start -> Run -> cmd. ->**Enter**
2. Type the **Telnet 192.168.10.1** (or the IP address of the switch). And then press **Enter**, user will directly enter the Telnet console.
3. Type the Login Name and its Password. The default Login Name and Password are **admin / admin**.



```
192.168.10.1
switch login: admin
Password:
DP612 (version 1.5-1551180291)
switch# █
```

SSH (Secure Shell)

WoMaster managed SWITCH also supports SSH console. User can remotely connect to the switch by command line interface. The SSH connection can secure all the configuration commands user sent to the switch.

SSH is a client/server architecture while the switch is the SSH server. When user wants to make SSH connection with the switch, user should download the SSH client tool first.

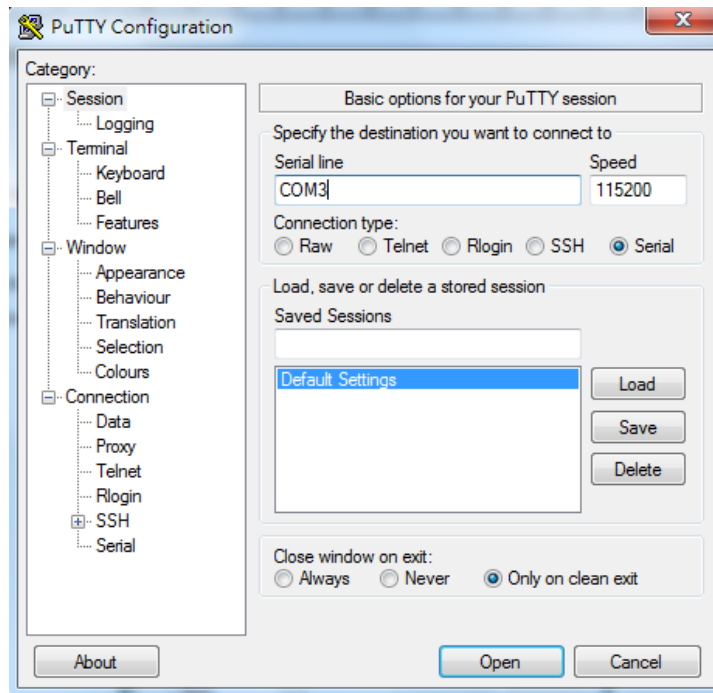
SSH Client

There are many free, sharewares, trials or charged SSH clients user can find on the internet, e.g., PuTTY is a free and popular Telnet/SSH client. We'll use this tool to demonstrate how to login by SSH. (PuTTY copyright 1997-2016 Simon Tatham).

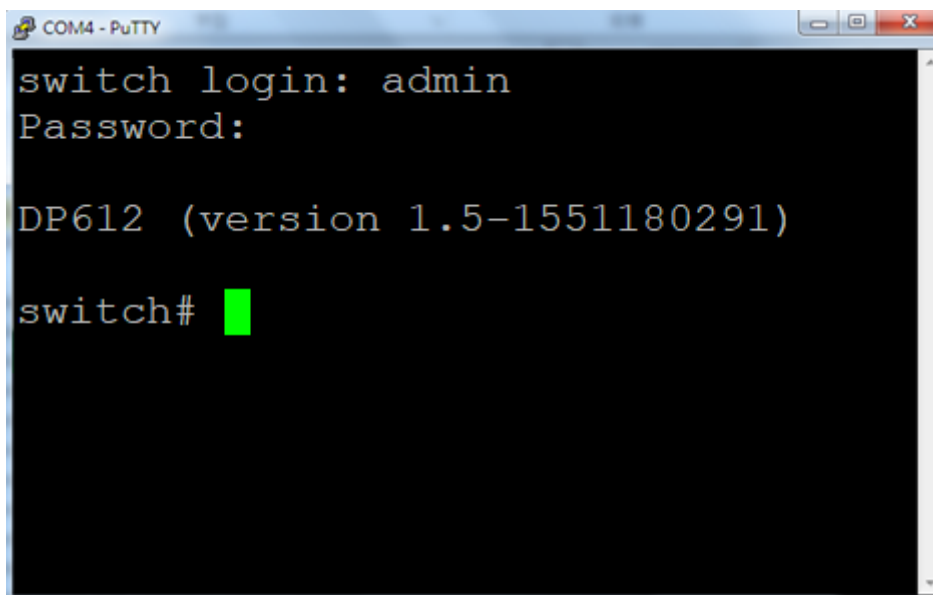
Download PuTTY: <http://www.chiark.greenend.org.uk/~sgtatham/putty/download.html>

1. Open SSH Client/PuTTY

In the **Session** configuration, choose the **Serial** protocol then enter the **Serial line** and **Speed**. For the serial line, please check the device manager to make sure the serial line name. The speed should be 115200. Then click on **Open** to start the SSH session console.



2. After it user can see the CLI command screen is pop-up
3. Type the Switch Login name and its Password. The default setting are **admin / admin**.



4. All the commands user sees in Putty are the same as the CLI commands user sees via RS232 console.
- The next chapter will introduce in detail how to use command line to configure some features in the switch.

2. UNDERSTANDING ALL COMMANDS

For either type of connection, access to the command line interface is generally referred to as an EXEC session. There are some different command modes. Each command mode has its own access ability, available command lines and uses different command lines to enter and exit.

User EXEC mode: As long as user login the SWITCH by CLI. User is in the **User EXEC mode**. User can ping, telnet remote device, and show some basic information. Type **exit** to logout. Press **?** to see the command list

```
SWITCH> ?
enable      Turn on privileged mode command
exit        Exit current mode and down to previous mode
list        Print command list
ping        Send echo messages
quit        Exit current mode and down to previous mode
show        Show running system information
telnet      Open a telnet connection
traceroute  Trace route to destination
```

Privileged EXEC mode: Press enable in the **User EXEC mode**, then User can enter the **Privileged EXEC mode**. In this mode, the system allows User to view current configuration, reset default, reload SWITCH, show system information, save configuration and enter the global configuration mode. Type **exit** to leave and press **?** to see the command list.

```
SWITCH# ?
archive     Manage archive files
clear       Remove all ARP entries
clock       Configure time-of-day clock
configure   Configuration from vty interface
copy        Copy from one file to another
debug       Debugging functions (see also 'undebug')
dir         Display a list of files
disable     Turn off privileged mode command
dot1x       IEEE 802.1x standard access security control
end         End current mode and change to enable mode
exit        Exit current mode and down to previous mode
list        Print command list
mac         MAC interface commands
no          Negate a command or set its defaults
pager       Terminal pager
ping        Send echo messages
quit        Exit current mode and down to previous mode
read        Read from flash
reboot      Reboot system
reload      copy a default-config file to replace the current one
show        Show running system information
telnet      Open a telnet connection
traceroute  Trace route to destination
usb         USB
write       Write running configuration to memory, network, or terminal
```

Global Configuration Mode: Type configure terminal in privileged EXEC mode. Then User can enter the Global Configuration mode. In Global Configuration mode, User can configure all the features that the system provides. Type **exit** to leave and press **?** to see the command list.

The command lists of global configuration mode.

SWITCH(config)# ?	
access-list	Add an access list entry
arp	Set a static ARP entry
auth	Authentication
cfm	IEEE 802.1ag - Connectivity Fault Management
clock	Configure time-of-day clock
default	Set a command to its defaults
dot1x	IEEE 802.1x standard access security control
end	End current mode and change to enable mode
erps	Ethernet Ring Protection Switching (ITU-T G.8032)
exit	Exit current mode and down to previous mode
gmrp	GMRP protocol
gvrp	GARP VLAN Registration Protocol
hostname	Set system's network name
interface	Select an interface to configure
ip	Global IP configuration subcommands
ipv6	IP information
key	Authentication key management
lACP	Link Aggregation Control Protocol
list	Print command list
lldp	Link Layer Discovery Protocol
log	Logging control
mac	Global MAC configuration subcommands
mac-address-table	mac address table
mirror	Port mirroring
nameserver	DNS Server
no	Negate a command or set its defaults
nTP	Configure NTP
poE	Configure power over ethernet
ptp	IEEE1588 PTPv2
qoS	Quality of Service (QoS)
relay	relay output type information
route-map	Create route-map or enter route-map command mode
router	Enable a routing process
service	enable service
sfp	Small form-factor pluggable
smtp-server	SMTP server configuration
snmp-server	the SNMP server
spanning-tree	the spanning tree algorithm
trunk	Trunk group configuration
user	Add or setup existing user account, password or privilege
vlan	Virtual LAN
warning-event	Warning event selection
write-config	Specify config files to write to

Interface Configuration: Many features are enabled for a particular interface. The Interface commands enable or modify the operation of an interface. In this mode, a physical port is set up for a specific logical connection operation. The Interface Configuration mode provides access to the router interface configuration commands.

This section has two interface configuration, **Port interface** and **VLAN interface**. For Port interface, type **interface IFNAME** in global configuration mode. Then User can enter the interface configuration mode. In this mode, User can configure port settings. In port interface, the name of Giga Ethernet port 1 is ge1, Giga Ethernet 2 is ge2, and so on. Type **exit** to leave current level and press **?** to see the command list

The command lists of the global configuration mode.

SWITCH(config)# interface ge1	
SWITCH(config-if)# ?	
acceptable	Configures the 802.1Q acceptable frame types of a port.
auto-negotiation	Enables auto-negotiation state of a given port
description	Interface specific description
dot1x	IEEE 802.1x standard access security control
duplex	Specifies the duplex mode of operation for a port
end	End current mode and change to enable mode
ethertype	Ethertype
exit	Exit current mode and down to previous mode
flowcontrol	Sets the flow-control value for an interface
garp	General Attribute Registration Protocol
ingress	802.1Q ingress filtering features
ip	Interface Internet Protocol config commands
lacp	Link Aggregation Control Protocol
list	Print command list
loopback	Specifies the loopback mode of operation for a port
mac	MAC interface commands
media-type	Specify media type
mtu	Specifies the MTU on a port.
no	Negate a command or set its defaults
poe	Configure power over ethernet
qos	Quality of Service (QoS)
quit	Exit current mode and down to previous mode
rate-limit	Rate limit configuration
sfp	Small form-factor pluggable
shutdown	Shutdown the selected interface
spanning-tree	the spanning-tree protocol
speed	Specifies the speed of a Fast Ethernet port or a Gigabit Ethernet port.
storm-control	Enables packets flooding rate limiting features
switchport	Set switching mode characteristics

The second section is VLAN interface, press **interface VLAN (VLAN-ID)** in global configuration mode. User can then enter VLAN interface configuration mode. In this mode, User can configure the settings for the specific VLAN. In VLAN interface, the name of VLAN 1 is VLAN 1, VLAN 2 is VLAN 2, and so on. To leave VLAN interface mode type **exit**. Press **?** to see the available command list.

The command lists of the VLAN interface configuration mode.

```
SWITCH(config)# interface vlan 1
SWITCH(config-if)# ?
description  Interface specific description
end          End current mode and change to enable mode
exit        Exit current mode and down to previous mode
ip          Interface Internet Protocol config commands
ipv6       Interface Internet Protocol config commands
list       Print command list
no         Negate a command or set its defaults
quit       Exit current mode and down to previous mode
shutdown   Shutdown the selected interface
vrrp       Virtual Router Redundancy Protocol (VRRP)
```

The table below presents the summary of the 5 command modes:

COMMAND MODE	MAIN FUNCTION	PROMPT
User EXEC	This is the first level of access. User can ping, telnet remote device, and show some basic information	SWITCH>
Privileged EXEC	In this mode, the system allows User to view current configuration, reset default, reload switch, show system information, save configuration...and enter global configuration mode.	SWITCH#
Global Configuration	In global configuration mode, User can configure all the features that the system provides User	SWITCH(config)#
Port Interface Configuration	In this mode, User can configure port related settings.	SWITCH(config-if)#
VLAN Interface Configuration	In this mode, User can configure settings for specific VLAN.	SWITCH(config-if)#

Here are some useful commands for User to see these available commands. Save User time in typing and avoid typing error. Press **?** to see all the available commands in this mode. It helps User to see the next command User can/should type as well.

```
SWITCH(config)# interface (?)
IFNAME      Interface's name
vlan        Select a vlan to configure
```

(Character)? To see all the available commands starts from this character.

```
SWITCH(config)# a?
administrator Administrator account setting
arp           Set a static ARP entry
auth         Authentication
```

The tab key helps User to input the command quicker. If there is only one available command in the next, clicking on tab key can help to finish typing soon.

```
SWITCH# co (tab) (tab)
configure copy

SWITCH(config)# ho (tab)
SWITCH(config)# hostname
```

Ctrl+C To stop executing the unfinished command.

Ctrl+S To lock the screen of the terminal. User can't input any command.

Ctrl+Q To unlock the screen which is locked by Ctrl+S.

Ctrl+Z To exit configuration mode.

Alert message when multiple users want to configure the switch. If the administrator is in configuration mode, then the Web users can't change the settings. Womaster Managed switch allows only one administrator to configure the switch at a time.

3. COMMANDS

3.1 CLI COMMANDS FOR SYSTEM CONFIGURATION

This chapter will show the CLI Command for System Features, and this chapter covers the information, User Account, Ip Setting, Date and Time and DHCP Server section. And the Show commands are used to display device settings, statistics and other information.

Feature	Command Line
SWITCH Setting	
System Name	SWITCH(config)# hostname DWORD This system's network name SWITCH(config)# hostname SWITCH SWITCH(config)#
System Location	SWITCH(config)# snmp-server location Taipei DWORD string that describes the system location information
System Contact	SWITCH(config)# snmp-server contact help@womaster.eu DWORD string that describes the system contact information
Display	SWITCH# show snmp-server name SWITCH SWITCH# show snmp-server location Taipei SWITCH# show snmp-server contact help@womaster.eu SWITCH# show version Model Name : DP612 Description : Industrial 12G Layer 3 Managed PoE Switch Serial Number : 1 Bootloader : 2.1.2.0 Software : 1.5-1551180291 MAC Address : 94:66:E7:9F:34:21 Protocol Source MAC : 94:66:E7:9F:06:D9 OID : 1.3.6.1.4.1.47114.1.1 Factory Default IP/Netmask : 192.168.10.1/24 Factory Default Gateway IP : 192.168.10.254
Admin Password	

User Name and Password	<pre> switch(config)# user user Add or setup existing user account, password or privilege switch(config)# user name NAME Account name string switch(config)# user name admin passwd Password setup switch(config)# user name admin passwd plain Plain text password switch(config)# user name admin passwd plain PASSWORD Plain text password string switch(config)# user name admin passwd plain 123456 privilege Privilege setup switch(config)# user name admin passwd plain 123456 privilege 0 Privilege 0 15 Privilege 15 SWITCH(config)# user name admin passwd plain 123456 privilege 15 </pre>
Display	<pre> switch# show users current user: admin index account privilege(0:read only 15:read/write) 1 admin 15 </pre>
IP Configuration	
IP Address/Mask (192.168.10.8, 255.255.255.0)	<pre> SWITCH(config-if)# int vlan 1 SWITCH(config-if)# ip address A.B.C.D/M IP address (e.g. 10.0.0.1/8) SWITCH(config-if)# ip address 192.168.10.8/24 SWITCH(config-if)# ip dhcp client renew DHCP Client is on SWITCH(config-if)# ipv6 address X:X::X:X/M IPv6 address (e.g. 3ffe:506::1/48) SWITCH(config-if)# ipv6 address 3ffe:506::1/48 </pre>
Gateway	<pre> SWITCH(config)# ip route 0.0.0.0/0 192.168.10.254/24 A.B.C.D IP destination prefix A.B.C.D/M IP destination prefix (e.g. 10.0.0.0/8) </pre>
Remove Gateway	<pre> SWITCH(config)# no ip route 0.0.0.0/0 192.168.10.254/24 </pre>
Display	<pre> SWITCH# show running-config ! interface vlan1 </pre>

	<pre>ip address 192.168.10.8/24 no shutdown ! ip route 0.0.0.0/0 192.168.10.254 !</pre>
Time Setting	
NTP Server	<pre>SWITCH(config)# ntp peer enable disable primary secondary SWITCH(config)# ntp peer primary IPADDR SWITCH(config)# ntp peer primary 192.168.10.120</pre>
Clock Setting	<pre>SWITCH# clock set TIME hh:mm:ss Current Time MONTH <1-12> Month of the year DAY <1-31> Day of the month YEAR <1993-2037> Year SWITCH# clock set 14:51:00 12 14 2021 Tue Dec 14 14:51:00 2021 (GMT) Greenwich Mean Time: Dublin, Edinburgh, Lisbon, London</pre>
Time Zone	<pre>SWITCH(config)# clock timezone 26</pre> <p>Note: By typing clock timezone ?, User can see the timezone list. Then choose the number of the timezone user want to select.</p>
Daylight Saving	<pre>SWITCH(config)# clock summer-time disable Disable summer (daylight saving) time enable Enable summer (daylight saving) time SWITCH(config)# SWITCH(config)# clock summer-time 4 0 2 12:00 4 0 3 12:00</pre> <p>Clock summer-time<start week of month ><start weekday> <start month><start Hour:Min><end week of month><end weekday><end month><end Hour:Min></p> <p>Start / End week of month: 1~5 (5 means the last week) Start / End weekday: 0 (Sunday) ~6 (Saturday) Start / End Month: 1 (Jan) ~12 (Dec)</p>

	START_TIME Start time, format hh:mm
IEEE 1588	SWITCH(config)# ptp run preferred-clock Preferred Clock slave Run as slave
Display	SWITCH# show ntp associations Network time protocol Status : Disabled Primary peer : N/A Secondary peer : N/A SWITCH# show clock summer-time Display summer (daylight saving) time timezone Display time zone SWITCH# show clock Tue Dec 14 15:00:00 2021 (GMT) Casablanca, Monrovia SWITCH# show clock summer-time Summer (daylight saving) time Status : Enabled Period : From 4th Sunday in February at 11:59 To 4th Sunday in March at 11:59 SWITCH# show clock timezone clock timezone (25) (GMT) Casablanca, Monrovia.
DHCP Server	
DHCP Server configuration Configure DHCP Server	[nable DHCP Server] SWITCH# configure terminal SWITCH(config)# service dhcp SWITCH(config)# SWITCH(config)# ip dhcp helper-address DHCP server address for relay agent pool Address Pool relay Relay Agent snoping Enable DHCP Snooping globally SWITCH (config)# ip dhcp pool testpool SWITCH (config-dhcp)# network 10.10.10.1/24 SWITCH (config-dhcp)# default-router 10.10.10.254
Lease time configure	SWITCH(config-dhcp)#lease 300 (300 sec)
DHCP Relay Agent	Enable DHCP Relay Agent

	<pre> SWITCH# SWITCH# configure terminal SWITCH(config)# ip dhcp snooping SWITCH(config)# SWITCH(config)# ip dhcp relay information option SWITCH(config)# SWITCH(config)# ip dhcp relay information policy drop Relay Policy keep Drop/Keep/Replace option82 field replace </pre>
<pre> Show DHCP Relay Agent </pre>	<pre> SWITCH# show ip dhcp relay DHCP Relay Agent ON ----- Re-forwarding policy: Replace Port Circuit-ID Hex Display ----- 1 00010001 00010001 2 00010002 00010002 3 00010003 00010003 4 00010004 00010004 5 00010005 00010005 6 00010006 00010006 7 00010007 00010007 8 00010008 00010008 9 00010009 00010009 10 0001000a 0001000a 11 0001000b 0001000b 12 0001000c 0001000c Remote-ID: 94:66:e7:7f:a9:23 (9466e77fa923) </pre>
<pre> Show DHCP server information </pre>	<pre> SWITCH# show ip dhcp server statistics DHCP Server OFF [Address Pool 1] network:0.0.0.0/0 default-router:0.0.0.0 lease time:604800 </pre>

	<p>Excluded Address List</p> <p>IP Address</p> <p>-----</p> <p>Manual Binding List (Port/IP)</p> <p>PortIP Address</p> <p>-----</p> <p>Manual Binding List (IP/MAC)</p> <p>IP Address MAC Address</p> <p>----- -----</p> <p>Option82 Binding List</p> <p>IP Address Circuit-ID Remote-ID</p> <p>----- ----- -----</p> <p>Leased Address List</p> <p>IP Address MAC Address Leased Time Remains</p> <p>----- ----- -----</p>
--	--

LACP	<pre>SWITCH(config)# lacp group 1 ge9-10 Group 1 based on LACP (802.3ad) is enabled! Note: different speed port can't be aggregated together.</pre>
Static Trunk	<pre>SWITCH(config)# trunk group 2 ge6-7 Trunk group 2 enable ok!</pre>
Display - LACP	<pre>SWITCH# show lacp internal LACP group 1 internal information: Port Port Admin Oper Port Port Priority Timeout Key Key State ----- 9 32768 Long 9 9 0x45 10 32768 Long 10 10 0x45 LACP group 2 is inactive LACP group 3 is inactive LACP group 4 is inactive LACP group 5 is inactive LACP group 6 is inactive LACP group 7 is inactive LACP group 8 is inactive</pre>
Display - Trunk	<pre>SWITCH# show trunk group 1 FLAGS: I -> Individual P -> In channel D -> Port Down Trunk Group TGID Protocol Load-Balance Ports -----+-----+----- 1 LACP src-dst-mac 9(D) 10(D) SWITCH# SWITCH# show trunk group 2 FLAGS: I -> Individual P -> In channel D -> Port Down Trunk Group TGID Protocol Load-Balance Ports -----+-----+----- 2 Static src-dst-mac 6(P) 7(D) SWITCH#</pre>
CFM	
Create	<pre>SWITCH(config)# cfm create domain IEEE 802.1ag Maintenance Domain SWITCH(config)# cfm create domain string Name Format: General string SWITCH(config)# cfm create domain string NAME Domain name, maximum of 43 characters SWITCH(config)# cfm create domain string test md-level IEEE 802.1ag Maintenance Domain Level SWITCH(config)# cfm create domain string test md-level <0-7> MD-Level 0~7 SWITCH(config)# cfm create domain string test md-level 2</pre>
Delete	<pre>SWITCH(config)# snmp-server community private rw community string add ok</pre>
Domain	<pre>SWITCH(config)# cfm domain NAME IEEE 802.1ag Domain name SWITCH(config)# cfm domain test</pre>

```

add          Add configuration item to Domain
association  IEEE 802.1ag Maintenance Association
delete      Delete configuration item from Domain
SWITCH(config)# cfm domain test add
association  IEEE 802.1ag Maintenance Association
SWITCH(config)# cfm domain test add association
string      Name Format: General string
SWITCH(config)# cfm domain test add association string
NAME        Association name, maximum of 45 characters
SWITCH(config)# cfm domain test add association string test1 vlan 1

```

```

Group
SWITCH (config)# cfm group
<0-255>   Group ID 0~255
SWITCH (config)# cfm group 2
rmep      IEEE 802.1ag Remote Maintenance End Point
SWITCH (config)# cfm group 2 rmep
<1-8191>  MEP-ID 1~8191
SWITCH (config)# cfm group 2 rmep 30

```

Display CFM

```

Database SWITCH# show cfm database
Domain/   Port  MP  Remote End-Point  MEP  Life   CCM   Flags
Association MAC Address  ID  time   Age   Timeout
-----
1
1         1    DE  --          1    --    --    Timeout SA
-----
Maintenance Point: (UE) Up End-Point, (DE) Down End-Point
Flags: (S) Static Entry, (D) Dynamic Entry
Status: (A) Active, (I) Inactive
NOTE: The Domain and Association names are truncated to 13 characters,
Lifetime and Age are in milliseconds.
-----

```

```

Domain SWITCH# show cfm domain
Domain: test, MD Level: 2

```

JumboFrame

```

Jumbo Frame Type the maximum MTU to enable for specific port (use ge1 for example)
Jumbo Frame:
switch(config)# interface ge1
SWITCH(config-if)# mtu
<64-9216> bytes
SWITCH(config-if)# mtu 9216
Disable Jumbo Frame:
Switch(config)# no system mtu

```

Display	<pre> SWITCH# show int ge8 Interface gigabitethernet8 Description : N/A Administrative Status : Disable Operating Status : Not Connected Duplex : Auto Speed : Auto MTU : 9216 Flow Control : off Default Port VLAN ID: 2 Ingress Filtering : Enabled Acceptable Frame Type : All Port Security : Disabled Auto Negotiation : Enable Loopback Mode : None STP Status: Disabled Default CoS Value for untagged packets is 0. Medium mode is Copper. </pre>
Storm Control	
Strom Control Configuration	<pre> SWITCH(config-if)# storm-control broadcast Broadcast packets dlf Destination Lookup Failure multicast Multicast packets SWITCH(config-if)# storm-control broadcast ? <2-262142> Rate limit value 2~262142 packet/sec SWITCH(config-if)# storm-control broadcast 1000 Enables rate limit for Broadcast packets for Port 8 SWITCH(config-if)# storm-control multicast 1000 Enables rate limit for Multicast packetsfor Port 8 SWITCH(config-if)# storm-control dlf 1000 Enables rate limit for Destination Lookup Failue packets for Port8. </pre>

3.3 CLI COMMANDS FOR PoE CONFIGURATION (PoE Model Only)

This chapter is about the PoE Configuration CLI Command. (PoE function are different depend on your model.)

Syntax	show poe system
Command Mode	Enable mode
Description	Display the status of the PoE system.
Examples	<pre>SWITCH# show poe system PoE System PoE Admin : Enable PoE Hardware : Normal Output power : 3.05 Watts Power Budget : Budget : 240 Watts Utilization : 1 % Event : Normal</pre>
Syntax	show poe interface IFNAME
Parameters	IFNAME : interface name
Command Mode	Enable mode
Description	Display the PoE status of interface.
Examples	<pre>SWITCH# show poe interface ge7 Interface gigabitethernet7 (POE Port 7) Control Mode : User (Enable) Powering Mode : 802.3af Operation Status : Powering Detection Status : Valid Classification : Class2 Output Power : 2.10 Watts, Voltage : 47.8 V, Current : 44.9 mA Power Budget : Budget Mode : Auto Budget : 35.00 Watts, Effective 7.70 Watts Utilization : 27 % Event : Normal</pre>
Syntax	show poe alive
Command Mode	Enable mode
Description	Display the status of pd status detection.
Examples	<pre>SWITCH# show poe alive-check PD Status Detection</pre>

	<p>Status : Enabled</p> <p>Host 1 :</p> <p> Target IP : 192.168.10.10</p> <p> Cycle Time : 10</p> <p>Host 2 :</p> <p> Target IP : 192.168.10.11</p> <p> Cycle Time : 20</p> <p>Host 3 :</p> <p> Target IP : 192.168.10.12</p> <p> Cycle Time : 30</p>
Syntax	show poe schedule IFNAME
Parameters	IFNAME : interface name
Command Mode	Enable mode
Description	Display the status of schedule of interface.
Examples	<pre>SWITCH# show poe schedule ge1 Interface gigabitethernet1 POE Schedule Status : Disable Weekly Schedule : Sunday : 0,1,2,3,4,5,6,7,8,19,20,21,22,23 Monday : 0,1,2,3,4,5,6,7,8,19,20,21,22,23 Tuesday : 0,1,2,3,4,5,6,7,8,19,20,21,22,23 Wednesday : 0,1,2,3,4,5,6,7,8,19,20,21,22,23 Thursday : 0,1,2,3,4,5,6,7,8,19,20,21,22,23 Friday : 0,1,2,3,4,5,6,7,8,19,20,21,22,23 Saturday : 0,1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20</pre>
Syntax	poe powering-mode 802.3af/forced/802.3at
Parameters	802.3af: deliver power if and only if the attached PD comply with IEEE 802.3af forced: deliver power no matter what PD attached
Command Mode	Interface mode
Description	Set the Powering mode of PoE
Examples	<pre>EX 1:Set 802.3af powering mode SWITCH(config-if)# poe powering-mode 802.3af EX 2:Set forced powering mode SWITCH(config-if)# poe powering-mode forced</pre>
Syntax	poe powering-mode 802.3at 2-event/ldp
Parameters	2-event: deliver power if and only if the attached PD comply with IEEE 802.3at physical layer classification

	lldp: deliver power if and only if the attached PD comply with IEEE 802.3at data link layer classification
Command Mode	Interface mode
Description	Set the Powering mode of PoE
Examples	EX 1: <i>Set 802.3at 2-event powering mode</i> SWITCH(config-if)# poe powering-mode 802.3at 2-event EX 2: <i>Set 802.3at lldp powering mode</i> SWITCH(config-if)# poe powering-mode 802.3at lldp
Syntax	poe control-mode user/schedule
Parameters	user: user mode schedule: schedule mode
Command Mode	Interface mode
Description	Set the control mode of port
Examples	Set PoE port 2 to user mode. EX 1: SWITCH(config)# interface ge2 SWITCH(config-if)# poe control-mode user Set PoE port 2 to schedule mode. EX 2: SWITCH(config-if)# poe control-mode schedule
Syntax	poe user enable/disable
Parameters	enable: enable port in user mode disable: disable port in user mode
Command Mode	Interface mode
Description	Enable/Disable the PoE of the port in user mode. If in schedule mode, it will come into effect when the control mode changes to user mode.
Examples	To enable the PoE function in user mode SWITCH(config-if)# poe user enable To disable the PoE function in user mode SWITCH(config-if)# poe user disable
Syntax	poe type TYPE (=port description)
Parameters	TYPE : port type string with max 20 characters
Command Mode	Interface mode
Description	Set the port type string.
Examples	Set the type string to "IPCam-1." SWITCH(config-if)# poe type IPCam-1

Syntax	poe budget [POWER]
Parameters	POWER : 0.4 – 30
Command Mode	Interface mode
Description	Set the port budget. The max budget is different between 802.3af, 802.3at and forced powering mode. The max budget of 802.3af powering mode is 15.4. The max budget of 802.3at powering mode is 30 The max budget of force powering mode is 30.
Examples	Set the max value of power consumption to 16 W with manual mode. SWITCH(config-if)# poe budget auto Auto mode manual Manual mode SWITCH(config-if)# poe budget manual [POWER] Auto mode: N/A, Manual: 0.44 - 35 Watts SWITCH (config-if)# poe budget manual 16
Syntax	poe schedule weekday hour
Parameters	Weekday : Valid range 0-6 (0=Sunday, 1=Monday, ..., 6=Saturday) Hour : Valid range 0-23, Valid format a,b,c-d
Command Mode	Interface mode
Description	Add a day schedule to an interface.
Examples	Add a schedule which enables PoE function at hour 1, 3, 5 and 10 to 23 on Sunday. SWITCH(config-if)# poe schedule 0 1,3,5,10-23
Syntax	no poe schedule weekday
Parameters	Weekday : Valid range 0-6 (0=Sunday, 1=Monday, ..., 6=Saturday)
Command Mode	Interface mode
Description	Remove a day schedule
Examples	Remove the Sunday schedule. SWITCH(config-if)# no poe schedule 0
Syntax	Poe budget, only apply for 1AC+2DC model, ex: RP628
Parameters	POWER : 0~200
Command Mode	Configuration mode
Description	Set the power budget of DC1
Examples	Set the power budget of DC1 to 200W SWITCH(config)# poe budget DC1 200w
Syntax	poe alive-check enable/disable
Parameters	enable: enable PD Status Detection function disable: disable PD Status Detection function

Command Mode	Configuration mode
Description	Enable/Disable the PD Status Detection function
Examples	To enable the function of pd status detect function SWITCH(config)# poe alive-check enable To disable the function of pd status detect function SWITCH(config)# poe alive-check disable
Syntax	poe alive-check ip_address ping interval
Parameters	IP address : A.B.C.D Ping Interval : Valid range is 10 to 3600 in multiple of 10
Command Mode	Configuration mode
Description	Apply a rule of PD Status Detection.
Examples	Apply a rule which ping 192.160.10.2 per 20 seconds. And if 192.160.1.2 is timeout, pd status detection will re-enable the PoE. SWITCH(config)# poe alive-check 192.160.10.2 20

3.4 CLI COMMANDS FOR REDUNDANCY CONFIGURATION

Feature	Command Line
Global (STP, RSTP, MSTP)	
Enable	SWITCH(config)# spanning-tree enable
Disable	SWITCH(config)# spanning-tree disable
Mode (Choose the Spanning Tree mode)	SWITCH(config)# spanning-tree mode rst the rapid spanning-tree protocol (802.1w) stp the spanning-tree prtocol (802.1d) mst the multiple spanning-tree protocol (802.1s)
Priority	SWITCH(config)# spanning-tree priority <0-61440> valid range is 0 to 61440 in multiple of 4096 SWITCH(config)# spanning-tree priority 4096
Bridge Times	SWITCH(config)# spanning-tree bridge-times (forward Delay) (max-age) (Hello Time) SWITCH(config)# spanning-tree bridge-times 15 20 2 <4-30> the value of forward delay time in seconds This command allows you configure all the timing in one time.
Forward Time	SWITCH(config)# spanning-tree forward-time <4-30> the value of forward delay time in seconds SWITCH(config)# spanning-tree forward-time 15
Max Age	SWITCH(config)# spanning-tree max-age <6-40> the value of message maximum age time in seconds SWITCH(config)# spanning-tree max-age 20
Hello Time	SWITCH(config)# spanning-tree hello-time <1-10> the value of hello time in seconds SWITCH(config)# spanning-tree hello-time 2
Pathcost	SWITCH(config)# spanning-tree pathcost method long specifies 32-bit based values that range from 1-200,000,000 short specifies 16-bit based values that range from 1-65535
transmission-limit	SWITCH(config)# spanning-tree transmission-limit <1-10> valid range from 1-10
MSTP	
Enter the MSTP Configuration Tree	SWITCH(config)# spanning-tree mst MSTMAP the mst instance number or range configuration enter mst configuration mode forward-time the forward dleay time hello-time the hello time

	<pre> max-age the message maximum age time max-hops the maximum hops sync sync port state of exist vlan entry SWITCH(config)# spanning-tree mst configuration SWITCH(config-mst)# abort exit current mode and discard all changes end exit current mode, change to enable mode and apply all changes exit exit current mode and apply all changes instance the mst instance list Print command list name the name of mst region no Negate a command or set its defaults quit exit current mode and apply all changes revision the revision of mst region show show mst configuration </pre>
Region Configuration	<pre> Region Name: SWITCH(config-mst)# name NAME the name string SWITCH(config-mst)# name Region Revision: SWITCH(config-mst)# revision <0-65535> the value of revision SWITCH(config-mst)# revision 65535 </pre>
Mapping Instance to VLAN (Ex: Mapping VLAN 2 to Instance 1)	<pre> SWITCH(config-mst)# instance <1-15> target instance number SWITCH(config-mst)# instance 1 vlan VLANMAP target vlan number(ex.10) or range(ex.1-10) SWITCH(config-mst)# instance 1 vlan 2 </pre>
Display Current MST Configuration	<pre> SWITCH(config-mst)# show current Current MST configuration Name Revision Instance Vlans Mapped ----- ----- 0 1,4-4094 1 2 2 3 ----- ----- </pre>

	<pre>Config HMAC-MD5 Digest: 0xB41829F9030A054FB74EF7A8587FF58D -----</pre>
Remove Region Name	<pre>SWITCH(config-mst)# no name name configure revision revision configure instance the mst instance SWITCH(config-mst)# no name</pre>
Remove Instance example	<pre>SWITCH(config-mst)# no instance <1-15> target instance number SWITCH(config-mst)# no instance 2</pre>
Show Pending MST Configuration	<pre>SWITCH(config-mst)# show pending Pending MST configuration Name [](->The name is removed by no name) Revision Instance Vlans Mapped ----- ----- 0 1,3-4094 1 2 (->Instance 2 is removed by no instance 2) ----- ----- Config HMAC-MD5 Digest: 0x3AB68794D602FDF43B21C0B37AC3BCA8 -----</pre>
Apply the setting and go to the configuration mode	<pre>SWITCH(config-mst)# quit apply all mst configuration changes SWITCH(config)#</pre>
Apply the setting and go to the global mode	<pre>SWITCH(config-mst)# end apply all mst configuration changes SWITCH#</pre>
Abort the Setting and go to the configuration mode. Show Pending to see the new settings are not applied.	<pre>SWITCH(config-mst)# abort discard all mst configuration changes SWITCH(config)# spanning-tree mst configuration SWITCH(config-mst)# show pending Pending MST configuration Name (->The name is not applied after Abort settings.) Revision Instance Vlans Mapped ----- -----</pre>

	<p>0 1,4-4094</p> <p>1 2</p> <p>2 3(-> The instance is not applied after Abort settings.)</p> <p>-----</p> <p>Config HMAC-MD5 Digest:</p> <p>0xB41829F9030A054FB74EF7A8587FF58D</p> <p>-----</p>
Port Configuration Mode	
Port Configuration	<p>SWITCH(config)# int ge2</p> <p>SWITCH(config-if)# spanning-tree</p> <p> bpdufilter a secure BPDU process on edge-port interfae</p> <p> bpduguard a secure response to invalid configurations(received BPDU sent by self)</p> <p> cost change an interafce's spanning-tree port path cost</p> <p> edge-port interface attached to a LAN segment that is at the end of a bridged LAN or to an end node</p> <p> link-type the link type for the Rapid Spanning Tree</p> <p> mst the multiple spanning-tree</p> <p> port-priority the spanning tree port priority</p> <p> stp-state the bridge port STP state</p>
Port Path Cost	<p>SWITCH(config-if)# spanning-tree cost</p> <p><1-200000000> 16-bit based value range from 1-65535, 32-bit based value range from 1-200,000,000</p> <p>SWITCH(config-if)# spanning-tree cost 200000</p>
Port Priority	<p>SWITCH(config-if)# spanning-tree port-priority</p> <p><0-240> the value of bridge port priority in multiple of 16</p> <p>SWITCH(config-if)# spanning-tree port-priority 128</p>
Link Type - Auto	<p>spanning-tree link-type</p> <p> auto automatically determines if IF is attached to a point-to-pointlink or shared media</p> <p> point-to-point a connection to exactly one other bridge</p> <p> shared a connection to two or more bridges</p> <p>SWITCH(config-if)# spanning-tree link-type auto</p>
Link Type - P2P	SWITCH(config-if)# spanning-tree link-type point-to-point
Link Type - Share	SWITCH(config-if)# spanning-tree link-type shared
Edge Port	SWITCH(config-if)# spanning-tree edge-port
MSTP Port Configuration	SWITCH(config-if)# spanning-tree mst

MSTMAP the mst instance number or range
 cost the mst instance port cost
 port-priority the mst instance port priority
 SWITCH(config-if)# spanning-tree mst MSTMAP cost
 <1-200000000> the value of mst instance port cost
 SWITCH(config-if)# spanning-tree mst MSTMAP port-priority
 <0-240> the value of mst instance port priority in multiple of 16

Global Information

Active Information

```

SWITCH# show spanning-tree active

Spanning-Tree : Enabled          Protocol : RSTP
Root Address : 9466.e79f.9834    Priority : 4096
Root Path Cost : 0                Root Port : N/A
Root Times : max-age 20, hello-time 2, forward-delay 15
Bridge Address : 9466.e79f.9834  Priority : 4096
Bridge Times : max-age 20, hello-time 2, forward-delay 15
BPDU transmission-limit : 3

Port          Role          State          Cost          Prio.Nbr      Type
-----
Aggregated
-----
ge1   Designated Forwarding  200000  128.1        P2P(RSTP)    N/A
ge5   Designated Forwarding  200000  128.5        P2P(RSTP)    N/A
ge7   Designated Forwarding  200000  128.7        P2P(RSTP)    N/A
ge10  Designated Forwarding  20000   128.10       P2P(RSTP)    N/A
  
```

RSTP Summary

```

SWITCH# show spanning-tree summary

Spanning-Tree : Enabled          Protocol : RSTP
Root Address : 9466.e79f.9834    Priority : 4096
Root Path Cost : 0                Root Port : N/A
Root Times : max-age 20, hello-time 2, forward-delay 15
Bridge Address 9466.e79f.9834    Priority : 4096
Bridge Times : max-age 20, hello-time 2, forward-delay 15
BPDU transmission-limit : 3
BPDU Skewing Detection : Disabled
Backbonefast : Disabled
Topology Change Flag : False     Topology Change Detected Flag : False
Topology Change Count : 7        Last Topology Change from : 0000.0000.0000
Timers: hello 1, topology change 0
  
```

	<pre> Summary of connected spanning tree ports : Port-State Summary Blocking Listening Learning Forwarding Disabled ----- - 0 0 0 4 6 Port Link-Type Summary AutoDetected PointToPoint SharedLink EdgePort ----- 10 0 0 8 </pre>
<p>Port Info</p>	<pre> SWITCH# show spanning-tree interface ge7 Interface fastethernet7 of Bridge is Enabled Port Role : Designated Port State : Forwarding Edge Port : Edge (Non-Edge) BPDU Filter : Disabled Link Type : Auto (Point-to-point) BPDU Guard : Disabled Timers : message-age 0, forward-delay 0 BPDUs : sent 368, received 1541 TCNs : sent 0, received 0 Message Expired Count : 0 Forward Transition Count : 2 Aggregation Group: N/A Type: N/A Aggregated with : N/A Port information port id 128.7 priority 128 cost 200000 Designated root address 9466.e79f.9834 priority 4096 cost 200000 Designated bridge address 9466.e79f.9834 priority 4096 port id 128.7 </pre>
<p>MSTP Information</p>	
<p>MSTP Configuration</p>	<pre> SWITCH# show spanning-tree mst configuration Current MST configuration (MSTP is Running) Name Revision Instance Vlans Mapped ----- 0 1,4-4094 1 2 2 3 ----- Config HMAC-MD5 Digest: 0xB41829F9030A054FB74EF7A8587FF58D ----- </pre>

<p>Display all MST Information</p>	<pre>SWITCH# show spanning-tree mst ##### MST00 vlans mapped: 1,4-4094 Bridge address 9466.e77f.a923 priority 32768 (sysid 0) Root this SWITCH for CST and IST Configured max-age 2, hello-time 15, forward-delay 20, max-hops 20 Port Role State Cost Prio.Nbr Type ----- ge1 Designated Forwarding 200000 128.1 P2P Internal(MSTP) ge2 Designated Forwarding 200000 128.2 P2P Internal(MSTP) ##### MST01 vlans mapped: 2 Bridge address 9466.e77f.a923 priority 32768 (sysid 1) Root this SWITCH for MST01 Port Role State Cost Prio.Nbr Type ----- ge1 Designated Forwarding 200000 128.1 P2P Internal(MSTP) ge2 Designated Forwarding 200000 128.2 P2P Internal(MSTP)</pre>
<p>MSTP Root Information</p>	<pre>SWITCH# show spanning-tree mst root MST Root Root Root Root Max Hello Fwd Instance Address Priority Cost Port age dly ----- MST00 9466.e77f.a923 32768 0 N/A 20 2 15 MST01 9466.e77f.a923 32768 0 N/A 20 2 15 MST02 9466.e77f.a923 32768 0 N/A 20 2 15</pre>
<p>MSTP Instance Information</p>	<pre>SWITCH# show spanning-tree mst 1 ##### MST01 vlans mapped: 2 Bridge address 9466.e77f.a923 priority 32768 (sysid 1) Root this SWITCH for MST01 Port Role State Cost Prio.Nbr Type ----- ge1 Designated Forwarding 200000 128.1 P2P Internal(MSTP) ge2 Designated Forwarding 200000 128.2 P2P Internal(MSTP)</pre>
<p>MSTP Port Information</p>	<pre>SWITCH# show spanning-tree mst interface ge1 Interface fastethernet1 of MST00 is Designated Forwarding Edge Port : Edge (Edge) BPDU Filter : Disabled</pre>

	<p>Link Type : Auto (Point-to-point) BPDUs Guard : Disabled</p> <p>Boundary : Internal(MSTP)</p> <p>BPDUs : sent 6352, received 0</p> <table border="1"> <thead> <tr> <th>Instance</th> <th>Role</th> <th>State</th> <th>Cost</th> <th>Prio.Nbr</th> <th>Vlans mapped</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Designated Forwarding</td> <td>Forwarding</td> <td>200000</td> <td>128.1</td> <td>1,4-4094</td> </tr> <tr> <td>1</td> <td>Designated Forwarding</td> <td>Forwarding</td> <td>200000</td> <td>128.1</td> <td>2</td> </tr> <tr> <td>2</td> <td>Designated Forwarding</td> <td>Forwarding</td> <td>200000</td> <td>128.1</td> <td>3</td> </tr> </tbody> </table>	Instance	Role	State	Cost	Prio.Nbr	Vlans mapped	0	Designated Forwarding	Forwarding	200000	128.1	1,4-4094	1	Designated Forwarding	Forwarding	200000	128.1	2	2	Designated Forwarding	Forwarding	200000	128.1	3
Instance	Role	State	Cost	Prio.Nbr	Vlans mapped																				
0	Designated Forwarding	Forwarding	200000	128.1	1,4-4094																				
1	Designated Forwarding	Forwarding	200000	128.1	2																				
2	Designated Forwarding	Forwarding	200000	128.1	3																				
ERPS																									
Instance	<pre>SWITCH(config)#erps <0-31> Ring identifier, valid range from 0 to 31 in decimal instance ERPS Instance SWITCH(config)# erps instance disable Disable ERPS Instance function enable Enable ERPS Instance function <0-15> ERPS Instance, valid range from 0 to 15 SWITCH(config)# erps instance 1 vlan vlan the vlan SWITCH(config)# erps instance 1 vlan 1 VLANMAP target vlan number(ex.10) or range(ex.1-10)</pre>																								
Display	<pre>SWITCH# show erps Ethernet Ring Protection Switching (ITU-T G.8032) Ring ID : 1 Version : v2 Ring State : Enabled Node State : Idle Node Role : Ring Node Control Channel : VLAN 1 Sub Ring without VC : False VC of Sub Ring : VLAN 1 ERPS Instance : Instance 1 Ring Port 0 : ge2 is Link Up and Forwarding Ring Port 1 : ge3 is Link Up and Forwarding RPL Port : Ring Port 1</pre>																								

	<p>Revertive Mode : Revertive</p> <p>Manual Switch :</p> <p>Forced Switch :</p> <p>Timers</p> <p>WTR Timer : period is 5 minutes, timer is not running, remains 0 ms</p> <p>WTB Timer : period is 5100 ms, timer is not running, remains 0 ms</p> <p>Guard Timer : period is 100 ms, timer is not running, remains 0 ms</p> <p>Statistics</p> <p>R-APS(FS) : sent 0, received 0</p> <p>R-APS(SF) : sent 5, received 4</p> <p>R-APS(FS) : sent 0, received 0</p> <p>R-APS(SF) : sent 0, received 0</p> <p>R-APS(MS) : sent 0, received 0</p> <p>R-APS(NR,RB) : sent 0, received 0</p> <p>R-APS(NR) : sent 0, received 0</p> <p>Node State Transition count 0</p>
--	---

3.5 CLI COMMANDS FOR VLAN CONFIGURATION

This chapter provides a detailed explanation of the Virtual LAN CLI commands. The commands are divided by functionality into the following different groups:

- VLAN Port Configuration is used to set the port VLAN ID, port accept frame type, Ingress and Egress rule and display switch settings, statistics and other information.
- VLAN Configuration is used to configure and create VLAN setting, and also display the setting and some information
- GVRP Configuration Commands are used to configure the GVRP feature.
- Management VLAN is used to set the VLAN management and display some information from the management VLAN.

Feature	Command Line
VLAN Port Configuration	
VLAN Port PVID	SWITCH(config-if)# switchport trunk native vlan 2 Set port default vlan id to 2 success
Port Accept Frame Type	SWITCH(config)# inter ge1 SWITCH(config-if)# acceptable frame type all any kind of frame type is accepted! SWITCH(config-if)# acceptable frame type vntaggedonly only vlan-tag frame is accepted!
Ingress Filtering (for fast Ethernet port 1)	SWITCH(config)# interface ge1 SWITCH(config-if)# ingress filtering enable ingress filtering enable SWITCH(config-if)# ingress filtering disable ingress filtering disable
Egress rule – Untagged (for VLAN 2)	SWITCH(config-if)# switchport access vlan 2 SWITCHport access vlan - success
Egress rule – Tagged (for VLAN 2)	SWITCH(config-if)# switchport trunk allowed vlan add 2
Display – Port Ingress Rule (PVID, Ingress Filtering, Acceptable Frame Type)	SWITCH# show interface ge1 Interface fastethernet1 Administrative Status : Enable Operating Status : Not Connected Duplex : Auto Speed : Auto Flow Control :off Default Port VLAN ID: 2

	<p>Ingress Filtering : Disabled</p> <p>Acceptable Frame Type : All</p> <p>Port Security : Disabled</p> <p>Auto Negotiation : Enable</p> <p>Loopback Mode : None</p> <p>STP Status: disabled</p> <p>Default CoS Value for untagged packets is 0.</p> <p>Medium mode is Copper.</p>
Display – Port Egress Rule (Egress rule, IP address, status)	<pre>SWITCH# show running-config ! interface ge1 SWITCHport access vlan 1 SWITCHport access vlan 3 SWITCHport trunk native vlan 2 interface vlan1 ip address 192.168.10.8/24 no shutdown</pre>
VLAN Configuration	
Create VLAN (2)	<pre>SWITCH(config)# vlan 2 vlan 2 success SWITCH(config)# interface vlan 2 SWITCH(config-if)#</pre> <p><i>Note: In CLI configuration, User should create a VLAN interface first. Then User can start to add/remove ports. Default status of the created VLAN is unused until User add member ports to it.</i></p>
Remove VLAN	<pre>SWITCH(config)# no vlan 2 no vlan success</pre> <p><i>Note: User can only remove the VLAN when the VLAN is in unused mode.</i></p>
VLAN Name	<pre>SWITCH(config)# vlan 2 vlan 2 has exists SWITCH(config-vlan)# name v2</pre>

	SWITCH(config-vlan)# no name <i>Note: Use no name to change the name to default name, VLAN VID.</i>																
VLAN description	SWITCH(config)# interface vlan 2 SWITCH(config-if)# SWITCH(config-if)# description this is the VLAN 2 SWITCH(config-if)# no description ->Delete the description.																
IP address of the VLAN	SWITCH(config)# interface vlan 2 SWITCH(config-if)# SWITCH(config-if)# ip address 192.168.10.18/24 SWITCH(config-if)# no ip address 192.168.10.8/24 ->Delete the IP address																
Create multiple VLANs (VLAN 5-10)	SWITCH(config)# interface vlan 5-10																
Shut down VLAN	SWITCH(config)# interface vlan 2 SWITCH(config-if)# shutdown SWITCH(config-if)# no shutdown ->Turn on the VLAN																
Display – VLAN table	SWITCH# sh vlan <table border="1"> <thead> <tr> <th>VLAN Name</th> <th>Status</th> <th>Trunk Ports</th> <th>Access Ports</th> </tr> </thead> <tbody> <tr> <td>1 VLAN1</td> <td>Static</td> <td>-</td> <td>ge1-10</td> </tr> <tr> <td>2 VLAN2</td> <td>Unused</td> <td>-</td> <td>-</td> </tr> <tr> <td>3 test</td> <td>Static</td> <td>ge4-7,ge8-10</td> <td>ge1-3,ge7,ge9-10</td> </tr> </tbody> </table>	VLAN Name	Status	Trunk Ports	Access Ports	1 VLAN1	Static	-	ge1-10	2 VLAN2	Unused	-	-	3 test	Static	ge4-7,ge8-10	ge1-3,ge7,ge9-10
VLAN Name	Status	Trunk Ports	Access Ports														
1 VLAN1	Static	-	ge1-10														
2 VLAN2	Unused	-	-														
3 test	Static	ge4-7,ge8-10	ge1-3,ge7,ge9-10														
GVRP configuration																	
GVRP enable/disable	SWITCH(config)# gvrp mode disable Disable GVRP feature globally on the SWITCH enable Enable GVRP feature globally on the SWITCH SWITCH(config)# gvrp mode enable Gvrp is enabled on the SWITCH!																
Configure GVRP timer Join timer /Leave timer/ LeaveAll timer	SWITCH(config)# inter ge1 SWITCH(config-if)# garp timer <10-10000> SWITCH(config-if)# garp join-timer 20 Garp join timer value is set to 20 centiseconds on port 2! Note: The unit of these timer is centisecond																
Management VLAN																	
Management VLAN	SWITCH(config)# int vlan 1 (Go to management VLAN)																

	SWITCH(config-if)# no shutdown
Display	<pre> SWITCH# show running-config ! interface vlan1 ip address 192.168.10.17/24 ip igmp no shutdown ! </pre>

The section below is the CLI command for PVLAN Configuration that divided by functionality into the following different groups:

- PVLAN Configuration is used to configure and create VLAN setting, and also display the setting and some information
- PVLAN Port Configuration is used to set the port VLAN ID, port accept frame type, Ingress and Egress rule and display switch settings, statistics and other information.
- PVLAN Information Commands are used to display the information in PVLAN Configuration.

Feature	Command Line
Private VLAN Configuration	
Create VLAN	<pre> SWITCH(config)# vlan 2 vlan 2 success SWITCH(config-vlan)# end End current mode and change to enable mode exit Exit current mode and down to previous mode list Print command list name Assign a name to vlan no no private-vlan Configure a private VLAN </pre>
Private VLAN Type	Go to the VLAN User want configure first.
Choose the Types	<pre> SWITCH(config)# vlan (VID) SWITCH(config-vlan)# private-vlan community Configure the VLAN as an community private VLAN isolated </pre>

Primary Type	Configure the VLAN as an isolated private VLAN primary
Isolated Type	Configure the VLAN as a primary private VLAN SWITCH(config-vlan)# private-vlan primary <cr>
Community Type	SWITCH(config-vlan)# private-vlan isolated <cr> SWITCH(config-vlan)# private-vlan community <cr>
Private VLAN Port Configuration	
Go to the port configuration	SWITCH(config)# interface (port_number, ex: gi9) SWITCH(config-if)# SWITCHport private-vlan host-association Set the private VLAN host association mapping map primary VLAN to secondary VLAN
Private VLAN Port Type	SWITCH(config-if)# SWITCHport mode private-vlan Set private-vlan mode
Promiscuous Port Type	SWITCH(config-if)# SWITCHport mode private-vlan host Set the mode to private-vlan host promiscuous Set the mode to private-vlan promiscuous
Host Port Type	SWITCH(config-if)# SWITCHport mode private-vlan promiscuous <cr> SWITCH(config-if)# SWITCHport mode private-vlan host <cr>
Private VLAN Port Configuration PVLAN Port Type	SWITCH(config)# interface ge9 SWITCH(config-if)# SWITCHport mode private-vlan host
Host Association primary to secondary (The command is only available for host port.)	SWITCH(config-if)# SWITCHport private-vlan host-association <2-4094> Primary range VLAN ID of the private VLAN port association SWITCH(config-if)# SWITCHport private-vlan host-association 2 <2-4094> Secondary range VLAN ID of the private VLAN port association SWITCH(config-if)# SWITCHport private-vlan host-association 2 3

Mapping primary to secondary VLANs (This command is only available for promiscuous port)	<pre>SWITCH(config)# interface ge10 SWITCH(config-if)# SWITCHport mode private-vlan promiscuous SWITCH(config-if)# SWITCHport private-vlan mapping 2 add 3 SWITCH(config-if)# SWITCHport private-vlan mapping 2 add 4 SWITCH(config-if)# SWITCHport private-vlan mapping 2 add 5</pre>
Private VLAN Information	
Private VLAN Information	<pre>SWITCH# show vlan private-vlan FLAGS: I -> Isolated P -> Promiscuous C -> Community Primary Secondary Type Ports ----- 2 3 Isolated ge10(P),ge9(I) 2 4 Community ge10(P),ge8(C) 2 5 Community ge10(P),ge7(C),ge9(I) 10 - - -</pre>
PVLAN Type	<pre>SWITCH# show vlan private-vlan type Vlan Type Ports ----- 2 primary ge10 3 isolated ge9 4 community ge8 5 community ge7,ge9 10 primary -</pre>
Host List	<pre>SWITCH# show vlan private-vlan port-list Ports Mode Vlan ----- 1 normal - 2 normal - 3 normal - 4 normal -</pre>

	<pre> 5 normal - 6 normal - 7 host 5 8 host 4 9 host 3 10 promiscuous 2 </pre>
<p>Running Config Information</p> <p>Private VLAN Type</p> <p>Private VLAN Port Information</p>	<pre> SWITCH# show run Building configuration... Current configuration: hostname SWITCH vlan learning independent ! vlan 1 ! vlan 2 private-vlan primary ! vlan 3 private-vlan isolated ! vlan 4 private-vlan community ! vlan 5 private-vlan community ! interface ge7 SWITCHport access vlan add 2,5 SWITCHport trunk native vlan 5 SWITCHport mode private-vlan host SWITCHport private-vlan host-association 2 5 ! interface ge8 SWITCHport access vlan add 2,4 SWITCHport trunk native vlan 4 </pre>

```
SWITCHport mode private-vlan host
SWITCHport private-vlan host-association 2 4
!
interface ge9
    SWITCHport access vlan add 2,5
    SWITCHport trunk native vlan 5
    SWITCHport mode private-vlan host
    SWITCHport private-vlan host-association 2 3
!
interface ge10
    SWITCHport access vlan add 2,5
    SWITCHport trunk native vlan 2
    SWITCHport mode private-vlan promiscuous
    SWITCHport private-vlan mapping 2 add 3-5
.....
.....
```

3.6 CLI COMMANDS FOR QoS CONFIGURATION

This chapter provides a detailed explanation of the QoS commands. The following commands are available.

The commands are divided into these different groups:

- Configuration Commands are used to configure features and options of the switch. For every configuration command there is a show command that will display the configuration setting.
- Show commands are used to display device settings, statistics and other information.

This chapter covered some sections such as, QoS Setting, CoS-Queue Mapping and DSCP-Queue Mapping.

Feature	Command Line
QoS Setting	
Queue Scheduling – Strict Priority	<pre>SWITCH(config)# qos queue-sched rr Round Robin sp Strict Priority wrr Weighted Round Robin SWITCH(config)# qos queue-sched sp <cr></pre>
Queue Scheduling – Round Robin	<pre>SWITCH(config)# qos queue-sched rr</pre>
Queue Scheduling - WRR	<pre>SWITCH(config)# qos queue-sched wrr</pre>
Port Setting – CoS (Default Port Priority)	<pre>SWITCH(config)# int ge8 SWITCH(config-if)# qos priority Configure the port default priority value SWITCH(config-if)# qos priority <0-7> Assign an priority (7 highest) Note: When change the port setting, User should Select the specific port first.</pre>
Trust Mode- CoS Only	<pre>SWITCH (config)# qos trust-mode cos 802.1p priority tag dscp TOS/DSCP field SWITCH (config)# qos trust-mode cos</pre>
Trust Mode- DSCP Only	<pre>SWITCH (config)# qos trust-mode cos 802.1p priority tag dscp TOS/DSCP field SWITCH (config)# qos trust-mode dscp</pre>
Display – Queue Scheduling	<pre>SWITCH# show qos queue-sched QoS queue scheduling scheme : Weighted Round Robin COS queue 0 = 1</pre>

	COS queue 1 = 1 COS queue 2 = 1 COS queue 3 = 1 COS queue 4 = 1 COS queue 5 = 1 COS queue 6 = 1 COS queue 7 = 1
Display –Trust Mode	SWITCH# show qos trust-mode QoS Trust Mode: 802.1p priority tag
Display –CoS (Port Priority)	SWITCH# show qos port-priority Port Default Priority : Port Priority -----+----- 1 0 2 0 3 0 4 0 5 0 6 0 7 0 8 0 9 0 10 0 11 0 12 0
CoS-Queue Mapping	
Format	SWITCH(config)# qos cos-map PRIORITY Assign an priority (7 highest) SWITCH(config)# qos cos-map 1 QUEUE Assign an queue (0-3) Note: Format: qos cos-map priority_value queue_value
Map CoS 0 to Queue 1	SWITCH(config)# qos cos-map 0 1 The CoS to queue mapping is set ok.
Map CoS 1 to Queue 0	SWITCH(config)# qos cos-map 1 0 The CoS to queue mapping is set ok.
Map CoS 2 to Queue 0	SWITCH(config)# qos cos-map 2 0 The CoS to queue mapping is set ok.

Map CoS 3 to Queue 1	SWITCH(config)# qos cos-map 3 1 The CoS to queue mapping is set ok.
Map CoS 4 to Queue 2	SWITCH(config)# qos cos-map 4 2 The CoS to queue mapping is set ok.
Map CoS 5 to Queue 2	SWITCH(config)# qos cos-map 5 2 The CoS to queue mapping is set ok.
Map CoS 6 to Queue 3	SWITCH(config)# qos cos-map 6 3 The CoS to queue mapping is set ok.
Map CoS 7 to Queue 3	SWITCH(config)# qos cos-map 7 3 The CoS to queue mapping is set ok.
Display – CoS-Queue mapping	SWITCH# sh qos cos-map CoS to Queue Mapping : CoS Queue ---- + ----- 0 1 1 0 2 0 3 1 4 2 5 2 6 3 7 3
DSCP-Queue Mapping	
Format	SWITCH(config)# qos dscp-map PRIORITY Assign an priority (63 highest) SWITCH(config)# qos dscp-map 0 QUEUE Assign an queue (0-3) Format: qos dscp-map priority_value queue_value
Map DSCP 0 to Queue 1	SWITCH(config)# qos dscp-map 0 1 The TOS/DSCP to queue mapping is set ok.
Display – DSCO-Queue mapping	SWITCH# show qos dscp-map DSCP to Queue Mapping : (dscp = d1 d2) d2 0 1 2 3 4 5 6 7 8 9 d1 -----+----- 0 1 1 1 1 1 1 1 1 0 0

	1 0000000000
	2 0000111111
	3 1122222222
	4 2222222233
	5 3333333333
	6 3333

3.7 CLI COMMANDS FOR MULTICAST FILTERING CONFIGURATION

IGMP Snooping is used to monitor IGMP messages between host and routers, and process these IGMP messages. IGMP Snooping make switch be able to track all network group members which are physically connected with switch that running between host and multicast routers to manage the member relationships. This chapter will cover the Multicast features CLI Command about configure and display the settings.

Feature	Command Line
IGMP Snooping	
IGMP Snooping - Global	SWITCH(config)# ip igmp snooping IGMP snooping is enabled globally. Please specify on which vlans IGMP snooping enables
IGMP Snooping - VLAN	SWITCH(config)# ip igmp snooping vlan VLANLIST allowed vlan list all all existed vlan SWITCH(config)# ip igmp snooping vlan 1-2 IGMP snooping is enabled on vlan 1 IGMP snooping is enabled on vlan 2
Disable IGMP Snooping - Global	SWITCH(config)# no ip igmp snoopin IGMP snooping is disabled globally ok.
Disable IGMP Snooping - VLAN	SWITCH(config)# no ip igmp snooping vlan 3 IGMP snooping is disabled on VLAN 3.
Display – IGMP Snooping Setting	SWITCH# show ip igmp interface vlan1 enabled: Yes version: IGMPv1 query-interval; 125s query-max-response-time: 10s SWITCH# show ip igmp snooping IGMP snooping is globally disabled Static Router Port: N/A Vlan1 is IGMP snooping enabled immediate-leave is disabled last-member-query-interval is 100 centiseconds source-only-learning is disabled
Display – IGMP Table	SWITCH# sh ip igmp snooping multicast all

	VLAN	IP Address	Type	Ports
	1	239.192.8.0	IGMP	ge6,
	1	239.255.255.250	IGMP	ge6,
IGMP Query				
IGMP Query V1	SWITCH(config)# int vlan 1 (Go to management VLAN) SWITCH(config-if)# ip igmp v1			
IGMP Query V2	SWITCH(config)# int vlan 1 (Go to management VLAN) SWITCH(config-if)# ip igmp			
IGMP Query version	SWITCH(config-if)# ip igmp version 1 SWITCH(config-if)# ip igmp version 2			
Disable	SWITCH(config)# int vlan 1 SWITCH(config-if)# no ip igmp			
Display	SWITCH# sh ip igmp interface vlan1 enabled: Yes version: IGMPv2 query-interval: 125s query-max-response-time: 10s SWITCH# show running-config ! interface vlan1 ip address 192.168.10.17/24 ip igmp no shutdown !			
Filtering Mode				
Enable Force filtering	SWITCH(config)# mac-address-table multicast filtering flood flood to all ports discard discard vlan Virtual LAN SWITCH(config)# mac-address-table multicast filtering discard vlan all Set VLAN all multicast filtering to discard mode.			

3.8 CLI COMMANDS FOR ROUTING CONFIGURATION

This chapter is about the Routing Configuration CLI Command.

Feature	Command Line
ARP	
Age Time	<pre>SWITCH (config)# arp aging-time <10-21600> seconds (10-21600) SWITCH (config)# arp aging-time 14400</pre>
Static ARP Entry	<pre>SWITCH (config)# arp A.B.C.D IP address of ARP entry aging-time access-list Named access-list aging-time Aging Time SWITCH (config)# arp 192.168.10.90 MACADDR 48-bit hardware address xxxx.xxxx.xxxx of ARP entry SWITCH (config)# arp 192.168.10.90 SWITCH (config)# arp 192.168.10.90 9466.e79f.5678 vlan L3 vlan interface SWITCH (config)# arp 192.168.10.90 9466.e79f.5678 vlan 1 interface L2 interface SWITCH (config)# arp 192.168.10.90 9466.e79f.5678 vlan 1 interface IFNAME Interface name, ex: gigabitethernet1 or g4 SWITCH (config)# arp 192.168.10.90 9466.e79f.5678 vlan 1 interface ge8 => The MAC address 9466.e79f.5678 with IP 192.168.10.90 is bind to the port 8 of VLAN 1.</pre>
ARP Table	<pre>SWITCH# show arp IP address Mac Address Port Vlan Age(min) Type ----- 192.168.10.80 708b.cd03.b567 ge5 1 233 Dynamic 192.168.10.90 9466.e79f.5678 ge8 1 0 Static</pre>
ARP Table Status	<pre>SWITCH # show arp status Aging time (secs) : 14400 ARP entry count : 2 ARP static entry count : 1 ARP dynamic entry count : 1</pre>

IP	
Global IP Routing Configuration	<pre>SWITCH (config)# ip route A.B.C.D IP destination prefix A.B.C.D/M IP destination prefix (e.g. 10.0.0.0/8)</pre>
Stop IP Routing	<pre>SWITCH (config)#no ip route A.B.C.D IP destination prefix A.B.C.D/M IP destination prefix (e.g. 10.0.0.0/8)</pre>
IP Interface Configuration	
Go to the VLAN Interface	<pre>SWITCH (config)# interface vlan 1 SWITCH (config-if)#</pre>
Create IP Address	<pre>SWITCH (config-if)# ip address A.B.C.D/M IP address (e.g. 10.0.0.1/8) Switch(config-if)# ip address 192.168.10.30/24</pre>
Create Secondary IP Address	<pre>SWITCH (config-if)# ip address 192.168.101.30/24 secondary</pre>
Change Interface to DOWN	<pre>SWITCH (config-if)# shutdown Interface vlan1 Change to DOWN</pre>
Activate the IP Interface	<pre>SWITCH (config-if)# no shutdown Interface vlan1 Change to UP</pre>
Show ip routing status	<pre>SWITCH # show ip route Codes: K - kernel route, C - connected, S - static, R - RIP, O - OSPF, IA - OSPF inter area, E1 - OSPF external type 1, E2 - OSPF external type 2, B - BGP, > - selected route, * - FIB route S>* 0.0.0.0/0 [1/0] via 192.168.10.254, vlan1 C>* 192.168.10.0/24 is directly connected, vlan1</pre>

Route	
Default Route	<pre> SWITCH(config)# ip route A.B.C.D IP destination prefix A.B.C.D/M IP destination prefix (e.g. 10.0.0.0/8) SWITCH (config)# ip route 0.0.0.0 A.B.C.D IP destination prefix mask SWITCH (config)# ip route 0.0.0.0 192.168.10.3 % Command incomplete. SWITCH (config)# ip route 0.0.0.0 192.168.10.3 A.B.C.D IP gateway address INTERFACE IP gateway interface name null0 Null interface blackhole Silently discard pkts when matched reject Emit an ICMP unreachable when matched SWITCH (config)# ip route 0.0.0.0 192.168.10.90 192.168.10.70 5 </pre>
Static Route	<pre> SWITCH # show ip route 0.0.0.0 Routing entry for 0.0.0.0/2 Known via "static", distance 5, metric 0, best * 192.168.10.70, via vlan1 </pre>
Show Static/Dynamic Route	<pre> SWITCH # show running-config ! ip route 0.0.0.0/2 192.168.10.70 5 ! </pre>
Routing Table Display	<pre> SWITCH # show ip route Codes: K - kernel route, C - connected, S - static, R - RIP, O - OSPF, IA - OSPF inter area, E1 - OSPF external type 1, E2 - OSPF external type 2, B - BGP, > - selected route, * - FIB route S>* 0.0.0.0/2 [5/0] via 192.168.10.70, vlan1 C>* 192.168.10.0/24 is directly connected, vlan1 </pre>

RIP	
(Before enable RIP, the IP Interfaces' setting should be configured and activated)	
Enable RIP protocol	<pre> SWITCH (config)# router rip SWITCH (config-router)# default-information Control distribution of default route default-metric Set a metric of redistribute routes distance Administrative distance distribute-list Filter networks in routing updates end End current mode and change to enable mode exit Exit current mode and down to previous mode list Print command list neighbor Specify a neighbor router network Enable routing on an IP network no Negate a command or set its defaults offset-list Modify RIP metric passive-interface Suppress routing updates on an interface quit Exit current mode and down to previous mode redistribute Redistribute information from another routing protocol route RIP static route configuration route-map Route map set timers Adjust routing timers version Set routing protocol version </pre>
RIP Version	<pre> SWITCH (config-router)# version <1-2> version SWITCH (config-router)# version 2 </pre>
RIP Network	<pre> SWITCH (config-router)# network 192.168.10.0/24 A.B.C.D/M IP prefix <network>/<length>, e.g., 35.0.0.0/8 WORD L3 Interface name </pre>
RIP Timer	<pre> SWITCH (config-router)# timers basic <5-2147483647> Routing table update timer value in second. Default is 30. </pre>
RIP Split Horizon	<pre> SWITCH (config-router)# passive-interface IFNAME Interface name default default for all interfaces SWITCH (config-router)# passive-interface default </pre>

<p>RIP default Metric (usually = 1)</p>	<pre>SWITCH (config-router)# default-metric <1-16> Default metric</pre>
<p>RIP Setting</p>	<pre>SWITCH # show ip rip status Routing Protocol is "rip" Sending updates every 30 seconds with +/-50%, next due in 18 seconds Timeout after 180 seconds, garbage collect after 120 seconds Outgoing update filter list for all interface is not set Incoming update filter list for all interface is not set Default redistribution metric is 1 Redistributing: Default version control: send version 2, receive version 2 Interface Send Recv Key-chain Routing for Networks: Routing Information Sources: Gateway BadPackets BadRoutes Distance Last Update Distance: (default is 120)</pre>
<p>RIP Table</p>	<pre>SWITCH # show ip rip Codes: R - RIP, C - connected, S - Static, O - OSPF, B - BGP Sub-codes: (n) - normal, (s) - static, (d) - default, (r) - redistribute, (i) - interface Network Next Hop Metric From Tag Time C(i) 192.168.10.0/24 0.0.0.0 1 self 0</pre>

OSPF	
(Before enable OSPF, the IP Interfaces' setting should be configured and activated first.)	
Go to the OSPF command line	<pre>SWITCH (config)# router ospf SWITCH (config-router)# area OSPF area parameters auto-cost Calculate OSPF interface cost according to bandwidth compatible OSPF compatibility list default-information Control distribution of default information default-metric Set metric of redistributed routes distance Define an administrative distance distribute-list Filter networks in routing updates end End current mode and change to enable mode exit Exit current mode and down to previous mode list Print command list neighbor Specify neighbor router network Enable routing on an IP network no Negate a command or set its defaults passive-interface Suppress routing updates on an interface quit Exit current mode and down to previous mode redistribute Redistribute information from another routing protocol refresh Adjust refresh parameters router-id router-id for the OSPF process timers Adjust routing timers</pre>
Router ID for OSPF	<pre>SWITCH (config-router)# router-id 192.168.5.251</pre>
OSPF Network and its Area ID (0.0.0.0 for example)	<pre>switch(config-router)# network A.B.C.D/M OSPF network prefix switch(config-router)# network 192.168.6.0/24 area Set the OSPF area ID switch(config-router)# network 192.168.6.0/24 area <0-4294967295> OSPF area ID as a decimal value A.B.C.D OSPF area ID in IP address format switch(config-router)# network 192.168.6.0/24 area 0.0.0.0</pre>
Interface Configuration	

Hello Interval	SWITCH(config-if)# ip ospf hello-interval <1-65535> Seconds SWITCH (config-if)# ip ospf hello-interval 10
Dead Interval	SWITCH(config-if)# ip ospf dead-interval 10 <1-65535> Seconds
Link Cost Change	SWITCH (config-if)# ip ospf cost <1-65535> Cost
Link Priority	SWITCH (config-if)# ip ospf priority <0-255> Priority
Authentication	switch(config-if)# ip ospf authentication <cr> message-digest Use message-digest authentication null Use null authentication
Authentication-key	switch(config-if)# ip ospf authentication-key AUTH_KEY The OSPF password (key)
Message-digest-key	switch(config-if)# ip ospf message-digest-key <1-255> Key ID
Retransmit-interval	switch(config-if)# ip ospf retransmit-interval 10 <3-65535> Seconds
Transmit-delay	switch(config-if)# ip ospf transmit-delay 10 <1-65535> Seconds

network	<pre>switch(config-if)# ip ospf network broadcast Specify OSPF broadcast multi-access network</pre>
---------	---

Display

IP OSPF Information	<pre>SWITCH # show ip ospf OSPF Routing Process, Router ID: 192.168.5.251 Supports only single TOS (TOS0) routes This implementation conforms to RFC2328 RFC1583Compatibility flag is disabled Initial SPF scheduling delay 200 millise(c)s Minimum hold time between consecutive SPFs 1000 millise(c)s Maximum hold time between consecutive SPFs 10000 millise(c)s Hold time multiplier is currently 1 SPF algorithm has not been run SPF timer is inactive Refresh timer 10 secs Number of external LSA 0. Checksum Sum 0x00000000 Number of areas attached to this router: 1 Area ID: 0.0.0.0 (Backbone) Number of interfaces in this area: Total: 0, Active: 0 Number of fully adjacent neighbors in this area: 0 Area has no authentication</pre>
---------------------	--

	<pre> SPF algorithm executed 0 times Number of LSA 0 Number of router LSA 0. Checksum Sum 0x00000000 Number of network LSA 0. Checksum Sum 0x00000000 Number of summary LSA 0. Checksum Sum 0x00000000 Number of ASBR summary LSA 0. Checksum Sum 0x00000000 Number of NSSA LSA 0. Checksum Sum 0x00000000 </pre>
IP OSPF Datasheet	<pre> Switch# show ip ospf database OSPF Router with ID (192.168.3.254) Router Link States (Area 0.0.0.0) Link ID ADV Router Age Seq# CkSum Link count 192.168.3.253 192.168.3.253 928 0x80000009 0xf3b2 2 192.168.3.254 192.168.3.254 927 0x8000000a 0xd4aa 3 192.168.5.254 192.168.5.254 230 0x80000006 0xc248 2 Net Link States (Area 0.0.0.0) Link ID ADV Router Age Seq# CkSum 192.168.3.254 192.168.3.254 927 0x80000003 0x7437 192.168.4.253 192.168.5.254 235 0x80000003 0x7334 </pre>

<p>IP OSPF Interface Information</p>	<pre>Switch# show ip ospf interface vlan1 is up ifindex 16, MTU 1500 bytes, BW 0 Kbit <UP,BROADCAST,RUNNING,MULTICAST> OSPF not enabled on this interface vlan2 is up ifindex 17, MTU 1500 bytes, BW 0 Kbit <UP,BROADCAST,RUNNING,MULTICAST> OSPF not enabled on this interface vlan5 is down ifindex 18, MTU 1500 bytes, BW 0 Kbit <BROADCAST,MULTICAST> OSPF not enabled on this interface</pre>
<p>IP OSPF Neighbor Table</p>	<pre>Switch# show ip ospf neighbor Neighbor ID Pri State Dead Time Address Interface RXmtL RqstL DBsmL -----</pre>
<p>IP OSPF Networking Routing Table</p>	<pre>Switch# show ip ospf route ===== OSPF network routing table ===== N 192.168.2.0/24 [10] area: 0.0.0.0 directly attached to vlan2 N 192.168.3.0/24 [10] area: 0.0.0.0 directly attached to vlan3 N 192.168.11.0/24 [10] area: 0.0.0.0 directly attached to vlan1</pre>

OSPF Setting in Configuration file	<pre> Switch# show running-config router ospf router-id 192.168.3.253 network 192.168.2.0/24 area 0.0.0.0 network 192.168.3.0/24 area 0.0.0.0 network 192.168.11.0/24 area 0.0.0.0 ! ip routing </pre>
Multicast Routing (Before enable MRoute, the IP Interfaces' setting should be configured and activated first.)	
Enable the MRoute & Configure the static entry	<pre> SWITCH(config)# ip multicast 224.0.1.10 vlan specify the ingress VLAN switch(config)# ip multicast 224.0.1.10 vlan VLANID valid range is 1 to 4094 switch(config)# ip multicast 224.0.1.10 vlan 1 egress-vlan specify the egress VLAN switch(config)# ip multicast 224.0.1.10 vlan 1 egress-vlan VLANID valid range is 1 to 4094 switch(config)# ip multicast 224.0.1.10 vlan 1 egress-vlan 5 interface specify an interface list to add to switch(config)# ip multicast 224.0.1.10 vlan 1 egress-vlan 5 interface ge6 </pre>
VRRP	
IP of VRRP	<pre> Switch(config-if)# vrrp 1 ip 192.168.10.1 The virtual router of vlan1 count is 1. Create virtual router 1 success. vrrp_created_returnvalue 0 </pre>
Priority of the interface	<pre> SWITCH(config-if)# vrrp 1 priority <1-254> virtual router's priority value in range 1-254, 255 for virtual IP owner and 100 for backup by default </pre>
Preempt of the	<pre> SWITCH(config-if)# vrrp 1 preempt </pre>

VRRP Information	<pre> SWITCH# show vrrp [1-255] virtual router identifier in the range 1-255 (decimal) brief display a summary view of the virtual router information Switch# show vrrp vlan1 - Virtual Router ID 1 State is Master Virtual IP address is 192.168.10.1 Virtual MAC address is 0000.5e00.0101 Priority is 100 Advertisement interval is 1 sec Preemption is enabled Master Router is 192.168.10.1 (local), priority is 100 Master Advertisement interval is 1.000 sec Master Down interval is 3.609 sec </pre>
VRRP Brief Information	<pre> Switch# show vrrp brief Interface VRID Prio Time Owner Pre State Master IP addr Virtual IP addr vlan1 1 100 3.609 - enabled Master 192.168.10.1 192.168.10.1 </pre>

3.9 CLI COMMANDS FOR SNMP CONFIGURATION

SNMP is the most widely used network management protocol in TCP/IP that offers a method for monitoring and managing computer network. For this reason, SNMP has been widely used and became de facto standard of network management. SNMPv2c provides several advantages over SNMPv1. SNMPv2c have expanded data types of 64-bit counter. It calls for improved efficiency and performance by introducing the GETBULK operation. Confirmed event notification is sought by the introduction of the Inform operator. Enhanced error handling approach, improved sets, and a fine tuned Data Definition Language are some of the advantages of SNMPv2c over the SNMPv1.

This chapter covers SNMP Community and SNMP Trap section. Through this function of reading or writing community name, the access control of the device is realized and the communication security is enhanced because the device will only accept the message with a qualified community name. Show commands are used to display device settings and other information.

Feature	Command Line
SNMP Community	
Read Only Community	SWITCH(config)# snmp-server community public ro community string add ok
Read Write Community	SWITCH(config)# snmp-server community private rw community string add ok
SNMP Trap	
Enable Trap	SWITCH(config)# snmp-server enable trap Set SNMP trap enable ok.
SNMP Trap Server IP without specific community name	SWITCH(config)# snmp-server host 192.168.10.33 SNMP trap host add OK, total host number = 1.
SNMP Trap Server IP with version 1 and community	SWITCH(config)# snmp-server host 192.168.10.33 version 1 private SNMP trap host add OK.con t Note: private is the community name, version 1 is the SNMP version
SNMP Trap Server IP with version 2 and community	SWITCH(config)# snmp-server host 192.168.10.33 version 2 private SNMP trap host add OK, total host number = 2.
Disable SNMP Trap	SWITCH(config)# no snmp-server enable trap Set SNMP trap disable ok.
Display	SWITCH# sh snmp-server trap SNMP trap: Enabled SNMP trap community: public

```
SWITCH# show running-config
.....
snmp-server community public ro
snmp-server community private rw
snmp-server enable trap
snmp-server host 192.168.10.33 version 2 admin
snmp-server host 192.168.10.33 version 1 admin
.....
```

3.10 CLI COMMANDS FOR SECURITY CONFIGURATION

This chapter covers the Security configuration setting by CLI Command.

Feature	Command Line
MAC/IP Filter	
Add MAC access list	<pre>SWITCH(config)# mac access-list extended NAME access-list name SWITCH (config)# mac access-list extended server1 SWITCH (config-ext-macl)# permit Specify packets to forward deny Specify packets to reject end End current mode and change to enable mode exit Exit current mode and down to previous mode list Print command list no Negate a command or set its defaults quit Exit current mode and down to previous mode</pre>
Add IP Standard access list	<pre>Switch(config)# ip access-list extended Extended access-list standard Standard access-list Switch(config)# ip access-list extended <100-199> Extended IP access-list number <2000-2699> Extended IP access-list number (expanded range) WORD access-list name Switch (config)# ip access-list standard 1 SWITCH(config-std-acl)# deny Specify packets to reject permit Specify packets to forward exit Exit current mode and down to previous mode list Print command list no Negate a command or set its defaults quit Exit current mode and down to previous mode remark Access list entry comment</pre>

Add IP Extended access list	<pre>Switch(config)# ip access-list extended <100-199> Extended IP access-list number <2000-2699> Extended IP access-list number (expanded range) WORD access-list name Switch(config)# ip access-list extended 100 Switch(config-ext-acl)#</pre>
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Add MAC	<pre>SWITCH(config)# mac-address-table static 9466.e79f.5678 vlan 1 interface ge1 mac-address-table ucast static set ok!</pre>
Display	<pre>SWITCH# show mac-address-table static Destination Address Address Type Vlan Destination Port ----- 9466.e79f.5678 Static 1 ge1</pre>

802.1x

enable	<pre>SWITCH(config)# dot1x system-auth-control SWITCH(config)# The Port-Based Network Access Control is globally enabled</pre>
disable	<pre>SWITCH(config)# no dot1x system-auth-control SWITCH(config)# The Port-Based Network Access Control is globally disabled</pre>
authentic-method	<pre>SWITCH(config)# dot1x authentic-method local Use the local username database for authentication radius Use the Remote Authentication Dial-In User Service (RADIUS) servers for authentication SWITCH(config)# dot1x authentic-method radius SWITCH(config)# dot1x authentic-method local</pre>
radius server-ip	<pre>SWITCH(config)# dot1x radius SWITCH(config)# dot1x radius server-ip 192.168.10.120 key 1234 RADIUS Server Port number NOT given. (default=1812) RADIUS Accounting Port number NOT given. (default=1813) RADIUS Server IP : 192.168.10.120 RADIUS Server Key : 1234 RADIUS Server Port : 1812 RADIUS Accounting Port : 1813 SWITCH(config)#</pre>
radius secondary-server-ip	<pre>SWITCH(config)# dot1x radius secondary-server-ip 192.168.10.250 key 5678</pre>

	Port number NOT given. (default=1812) RADIUS Accounting Port number NOT given. (default=1813) Secondary RADIUS Server IP : 192.168.10.250 Secondary RADIUS Server Key : 5678 Secondary RADIUS Server Port : 1812 Secondary RADIUS Accounting Port : 1813
User name/password for authentication	SWITCH(config)# dot1x username abc passwd 123456 vlan 1
DHCP snooping	
Trust	SWITCH(config)# interface ge1
	SWITCH(config-if)# ip dhcp snooping trust
Untrust	SWITCH(config-if)#
	SWITCH(config-if)# no ip dhcp snooping trust

3.11 CLI COMMANDS FOR WARNING CONFIGURATION

This chapter is about the Warning Configuration by using CLI Command. Womaster Switch supports device alarm and related alarm report, alarm enable/disable, and alarm searching. It assures that the alarm will be reported to the customer timely and accurately

Feature	Command Line
Relay Output	
Relay Output	<pre>SWITCH(config)# relay 1 di DI state dry dry output ping ping failure port port link failure power power failure ring ring failure</pre> <p>Note: Select Relay 1 or 2 first, then select the event types.</p>
DI State	<pre>SWITCH(config)# relay 1 di <1-2> DI number SWITCH(config)# relay 1 di 1 high high is abnormal low low is abnormal SWITCH(config)# relay 1 di 1 high</pre>
Dry Output	<pre>SWITCH(config)# relay 1 dry <0-65535> turn on period in second SWITCH(config)# relay 1 dry 5 <0-65535> turn on period in second SWITCH(config)# relay 1 dry 5 5</pre>
Ping Failure	<pre>SWITCH(config)# relay 1 ping 192.168.10.33 <cr> reset reset a device SWITCH(config)# relay 1 ping 192.168.10.33 reset <1-65535> reset time SWITCH(config)# relay 1 ping 192.168.10.33 reset 60 <0-65535> hold time to retry SWITCH(config)# relay 1 ping 192.168.10.33 reset 60 60</pre>
Port Link Failure	<pre>SWITCH(config)# relay 1 port PORTLIST port list</pre>

	SWITCH(config)# relay 1 port ge1-5
Power Failure	SWITCH(config)# relay 1 power <1-2> power id SWITCH(config)# relay 1 power 1 SWITCH(config)# relay 1 power 2
Ring Failure	SWITCH(config)# relay 1 ring
Disable Relay	SWITCH(config)# no relay <1-2> relay id SWITCH(config)# no relay 1 (Relay_ID: 1 or 2) <cr>
Display	SWITCH# show relay 1 Relay 1 Event : Power : Disabled Port Link : Disabled Ring : Enabled Ping : Disabled Ping Reset : Disabled Dry Output : Disabled DI : Disabled
Event Selection	
Event Selection	SWITCH(config)# warning-event coldstart Switch cold start event warmstart Switch warm start event linkdown Switch link down event linkup Switch link up event authentication Authentication failure event di Switch di event loop-protect Switch loop protection event poe-powering Switch PoE powering or unpowering event power Switch power failure event relay-output Switch relay output event ring Switch ring event sfp Switch SFP event time-sync Switch time synchronize event
Ex: Cold Start event	SWITCH(config)# warning-event coldstart Set cold start event enable ok.
Ex: Link Up event	SWITCH(config)# warning-event linkup

	<pre>[IFNAME] Interface name, ex: ge1 or ge8 SWITCH(config)# warning-event linkup ge5 Set ge5 link up event enable ok.</pre>
Display	<pre>SWITCH# show warning-event Warning Event: Cold Start: Disabled Warm Start: Disabled Authentication Failure: Disabled Link Down: Disabled Link Up: Disabled Power Failure: Disabled Ring: Disabled Relay Output: Disabled Time Synchronize Failure: Disabled PoE Powering: Disabled SFP: Disabled DI: Disabled Loop Protection: Disabled</pre>
Syslog Setting	
Local Mode	<pre>SWITCH(config)# log syslog local</pre>
Server Mode	<pre>SWITCH(config)# log syslog remote 192.168.10.4</pre>
Both	<pre>SWITCH(config)# log syslog local SWITCH(config)# log syslog remote 192.168.10.4</pre>
Disable	<pre>SWITCH(config)# no log syslog local</pre>
Email Alert	
SMTP Enable	<pre>SWITCH(config)# smtp-server enable email-alert SMTP Email Alert set enable ok.</pre>
Sender mail	<pre>SWITCH(config)# smtp-server server 192.168.10.100 ACCOUNT SMTP server mail account, ex: help@womaster.eu SWITCH(config)# smtp-server server 192.168.10.100 help@womaster.eu SMTP Email Alert set Server: 192.168.10.100, Account: info@womaster.eu ok.</pre>
Receiver mail	<pre>SWITCH(config)# smtp-server receipt 1 help@womaster.eu SMTP Email Alert set receipt 1: help@womaster.eu ok.</pre>
Authentication with username and password	<pre>SWITCH(config)# smtp-server authentication username admin password admin SMTP Email Alert set authentication Username: admin, Password: admin</pre> <p>Note: User can assign string to username and password.</p>

Disable SMTP	SWITCH(config)# no smtp-server enable email-alert SMTP Email Alert set disable ok.
Disable Authentication	SWITCH(config)# no smtp-server authentication SMTP Email Alert set Authentication disable ok.
Display	SWITCH# sh smtp-server SMTP Email Alert is Enabled Server: 192.168.10.100, Account: help@womaster.eu Authentication: Enabled Username: admin, Password: admin SMTP Email Alert Receipt: Receipt 1: help@womaster.eu Receipt 2: Receipt 3: Receipt 4:

3.12 CLI COMMANDS FOR DIAGNOSTICS CONFIGURATION

This chapter is about Diagnostics feature, the features that include in Diagnostics are LLDP, MAC Address Table, Port Statistics, Port Mirroring, Event Log, and Ping.

Feature	Command Line
LLDP	
Enable LLDP	SWITCH(config)# lldp holdtime Specify the holdtime of LLDP in seconds <10-255> Valid range is 10~255 run Enable LLDP timer Set the transmission frequency of LLDP in seconds <5-254> Valid range is 5~254
MAC Address Table	
Aging Time	SWITCH(config)# mac-address-table aging-time 350 mac-address-table aging-time set ok! TIMEVALUE aging time in seconds, the range is 15 to 3825 seconds <i>Note: 350 is the new ageing timeout value.</i>
Add Static Unicast MAC address	SWITCH(config)# mac-address-table static 9466.e79f.5678 vlan 1 interface ge7 mac-address-table ucast static set ok! Note: rule: mac-address-table static MAC_address VLAN VID interface interface_name
Add Multicast MAC address	SWITCH(config)# mac-address-table multicast 0100.5e01.0101 vlan 1 interface ge6-7 Adds an entry in the multicast table ok! MACADDR destination mac address xxxx.xxxx.xxxx (multicast) to add to the address table Note: rule: mac-address-table multicast MAC_address VLAN VID interface_list interface_name/range SWITCH(config)# mac-address-table multicast filtering filtering filtering of unknown multicast addresses flood flood to all ports discard discard vlan Virtual LAN
Show MAC Address Table	SWITCH# show mac-address-table

<p>– All types</p>	<pre> ***** UNICAST MAC ADDRESS ***** Destination Address Address Type Vlan Destination Port ----- 000f.b079.ca3b Dynamic 1 ge4 9466.e79f.5678 Dynamic 1 ge7 9466.e700.00e7 Static 1 ge7 9466.e75f.05b9 Static 1 ge7 9466.e79d.0069 Management 1 ***** MULTICAST MAC ADDRESS ***** Vlan Mac Address COS Status Ports ----- 1 9466.e79d.0069 0 ge6 1 9466.e79f.06d9 0 ge4,ge6 </pre>
<p>Show MAC Address Table – Dynamic Learnt MAC addresses</p>	<pre> SWITCH# show mac-address-table dynamic Destination Address Address Type Vlan Destination Port ----- 9466.e700.00e7 Dynamic 1 ge4 9466.e79f.06d9 Dynamic 1 ge7 </pre>
<p>Show MAC Address Table – Multicast MAC addresses</p>	<pre> SWITCH# show mac-address-table multicast Vlan Mac Address COS Status Ports ----- 1 9466.e79f.06d9 0 ge6-7 1 9466.e700.00e7 0 ge4,ge6-7 </pre>
<p>Show MAC Address Table – Static MAC addresses</p>	<pre> SWITCH# show mac-address-table static Destination Address Address Type Vlan Destination Port ----- 9466.e700.00e7 Static 1 ge7 9466.e75f.05b9 Static 1 ge7 </pre>
<p>Show Aging timeout time</p>	<pre> SWITCH# show mac-address-table aging-time the mac-address-table aging-time is 345 sec. </pre>
<p>Port Statistics</p>	
<p>Port Statistics</p>	<pre> SWITCH# show rmon statistics ge4 (select interface) Interface fastethernet4 is enable connected, which has Inbound: Good Octets: 178792, Bad Octets: 0 Unicast: 598, Broadcast: 1764, Multicast: 160 </pre>

	<p>Pause: 0, Undersize: 0, Fragments: 0</p> <p>Oversize: 0, Jabbers: 0, Discards: 0</p> <p>Filtered: 0, RxError: 0, FCSError: 0</p> <p>Outbound:</p> <p>Good Octets: 330500</p> <p>Unicast: 602, Broadcast: 1, Multicast: 2261</p> <p>Pause: 0, Deferred: 0, Collisions: 0</p> <p>SingleCollision: 0, MultipleCollision: 0</p> <p>ExcessiveCollision: 0, LateCollision: 0</p> <p>Filtered: 0, FCSError: 0</p> <p>Number of frames received and transmitted with a length of:</p> <p>64: 2388, 65to127: 142, 128to255: 11</p> <p>256to511: 64, 512to1023: 10, 1024toMaxSize: 42</p>
Port Mirroring	
Enable Port Mirror	<pre>SWITCH(config)# mirror en</pre> <p>Mirror set enable ok.</p>
Disable Port Mirror	<pre>SWITCH(config)# mirror disable</pre> <p>Mirror set disable ok.</p>
Select Source Port	<pre>SWITCH(config)# mirror source ge1-2</pre> <p>both Received and transmitted traffic</p> <p>rx Received traffic</p> <p>tx Transmitted traffic</p> <pre>SWITCH(config)# mirror source ge1-2 both</pre> <p>Mirror source ge1-2 both set ok.</p> <p>Note: Select source port list and TX/RX/Both mode.</p>
Select Destination Port	<pre>SWITCH(config)# mirror destination ge6</pre> <p>Mirror destination ge6 both set ok</p>
Display	<pre>SWITCH# show mirror</pre> <p>Mirror Status : Enabled</p> <p>Monitor Destination Port : ge6</p> <p>Ingress Source Ports :ge1,ge2,</p> <p>Egress Source Ports :ge1,ge2,</p>
Event Log	
Display	<pre>SWITCH# show event-log</pre> <p>Jan 1 00:06:56 switch Event: Link 2 Down.</p> <p>Jan 1 00:06:56 switch Event: Ring11 Become Protection state.</p> <p>Jan 1 00:06:56 switch Event: Ring11, Port 2 Link Change to DOWN.</p>

	<pre> Jan 1 00:06:57 switch Event: Link 2 Up. Jan 1 00:06:58 switch Event: Ring11 Become Non Protection state. Jan 1 00:06:58 switch Event: Ring11, Port 2 Link Change to UP. </pre>
Ping	
Ping IP	<pre> SWITCH# ping 192.168.10.4 PING 192.168.10.4 (192.168.10.4): 56 data bytes 64 bytes from 192.168.10.4: seq=0 ttl=64 time=5.6 ms 64 bytes from 192.168.10.4: seq=1 ttl=64 time=0.8 ms 64 bytes from 192.168.10.4: seq=2 ttl=64 time=1.0 ms 64 bytes from 192.168.10.4: seq=3 ttl=64 time=1.0 ms 64 bytes from 192.168.10.4: seq=4 ttl=64 time=0.8 ms --- 192.168.10.4 ping statistics --- 5 packets transmitted, 5 packets received, 0% packet loss round-trip min/avg/max = 0.8/1.8/5.6 ms </pre>

3.13 CLI COMMANDS FOR BACKUP RESTORE

This chapter provides a detailed explanation of the Backup and Restore the configuration by using CLI commands.

Feature	Command Line
Backup Startup Configuration file	<pre> SWITCH# copy startup-config tftp: 192.168.10.33/default.conf Writing Configuration [OK] </pre> <p>Note: 192.168.10.33 is the TFTP server's IP and default.conf is name of the configuration file. User environment may use different IP addresses or different file name. Please type target TFTP server IP or file name in this command.</p>
Restore Configuration	<pre> SWITCH# copy tftp: /default.conf startup-config </pre>
Show Startup Configuration	<pre> SWITCH# show startup-config </pre>
Show Running Configuration	<pre> SWITCH# show running-config </pre>

3.14 CLI COMMANDS FOR FIRMWARE UPGRADE

This chapter covers the CLI Command for upgrading the switch firmware.

Feature	Command line
Firmware Upgrade	<pre> SWITCH# archive download-sw /overwrite tftp "ip address" "firmwarefile".bin → binary code file name Firmware upgrading, don't turn off the SWITCH! Tftping file "firmwarefile".bin → binary code file name Firmware upgrading Firmware upgrade success!! Rebooting..... </pre>

3.15 CLI COMMANDS FOR RESET

This chapter is about CLI command to reset to factory default configuration.

Feature	Command Line
Factory Default	<pre> SWITCH# reload default-config file Reload OK! SWITCH# reboot </pre>

3.16 CLI COMMANDS FOR SAVE & LOAD

This chapter is cover two function from the switch, Save and Load the configuration CLI command.

Feature	Command Line
Save	<pre> SWITCH# write Building Configuration... --- save configuration [OK] </pre>
Load	<pre> SWITCH# copy running-config startup-config --- load configuration Building Configuration... [OK] </pre>

3.17 CLI COMMANDS FOR LOGOUT

This chapter is about the CLI Command for log out from the switch CLI interface.

Feature	Command Line
Logout	SWITCH> exit SWITCH# exit SWITCH login: admin Password:

3.18 CLI COMMANDS FOR REBOOT

This chapter is about restart the device using CLI Command.

Feature	Command Line
Reboot	SWITCH# reboot