

# Moxa Managed Switch Next-generation OS Command Line Interface

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Version 1.1, October 2020

[www.moxa.com/product](http://www.moxa.com/product)

**Models covered by this user's manual:**

MDS-G4000 Series Managed Ethernet Switches



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# Moxa Managed Switch Next-generation OS Command Line Interface

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# Table of Contents

<b>1. About This Manual</b>	<b>1-1</b>
<b>2. Understanding the Command Line Interface</b>	<b>2-1</b>
Accessing the Switch	2-2
Logging in using the RS-232 Console	2-2
Logging in using Telnet	2-5
Command Modes	2-7
Basic Configuration	2-7
Understanding All Command Modes	2-7
Help Messages	2-8
Special Usage and Limitations	2-8
Abbreviated Commands	2-9
No and Default Forms of Commands	2-11
CLI Error Messages	2-11
Command History	2-13
<b>3. Commands</b>	<b>3-1</b>
System	3-2
System Management	3-2
Account Management	3-6
Network	3-9
Time	3-20
Port	3-28
Port Interface	3-28
Link Aggregation	3-36
PoE	3-41
Layer 2 Switching	3-52
VLAN	3-52
MAC	3-68
QoS	3-70
Multicast	3-86
Network Redundancy	3-99
Layer 2 Redundancy	3-99
Management	3-118
Network Management	3-118
Security	3-130
Device Security	3-130
Network Security	3-139
Authentication	3-153
Diagnostics	3-155
System Status	3-155
Event Notification	3-158
Diagnosis	3-169
Maintenance and Tool	3-188

# 1

## About This Manual

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This chapter describes how to use the command line to configure Moxa's managed Ethernet switches. Besides the web interface configuration, the command line interface helps system administrators easily and quickly manage, monitor, and configure Moxa's managed Ethernet switch.

# 2

## Understanding the Command Line Interface

---

This chapter helps users understand the command line interface, and demonstrates a general ideal on the command line operation.

The following topics are covered in this chapter:

- ❑ **Accessing the Switch**
  - Logging in using the RS-232 Console
  - Logging in using Telnet
- ❑ **Command Modes**
  - Basic Configuration
  - Understanding All Command Modes
- ❑ **Help Messages**
- ❑ **Special Usage and Limitations**
- ❑ **Abbreviated Commands**
- ❑ **No and Default Forms of Commands**
- ❑ **CLI Error Messages**
- ❑ **Command History**

# Accessing the Switch

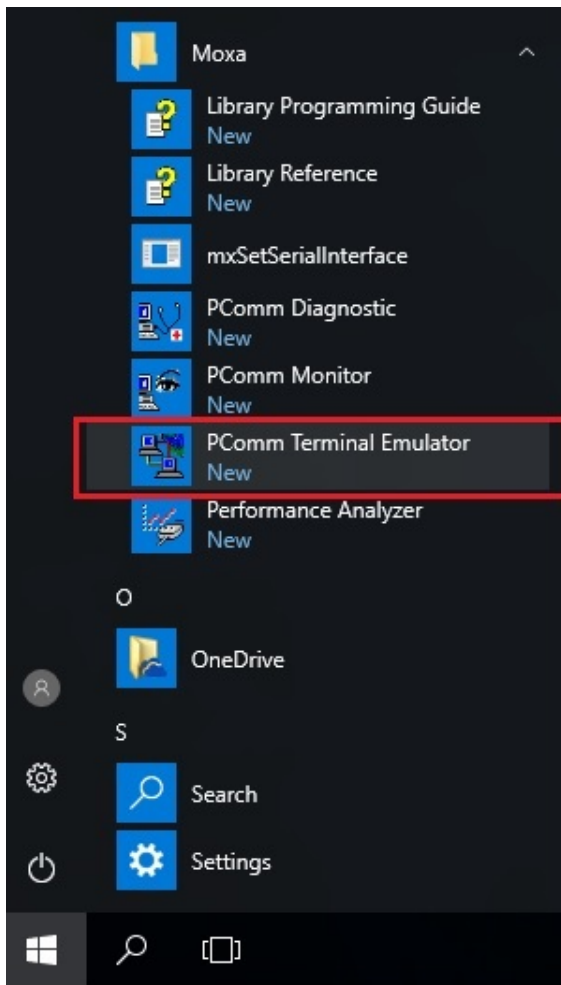
Users can connect to the switch using one of two methods: by console or by Telnet.

## Logging in using the RS-232 Console

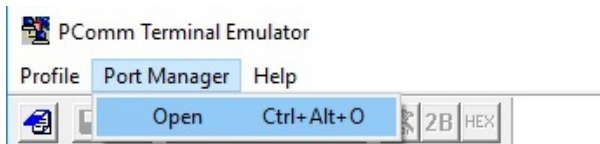
The Moxa managed switch features an RJ45 serial console port to allow users to connect to the switch and configure settings.

**NOTE** Moxa recommends using PComm Terminal Emulator for serial communication. This software is available for free on the Moxa website. You can use other serial communication software, but the following instructions may be different.

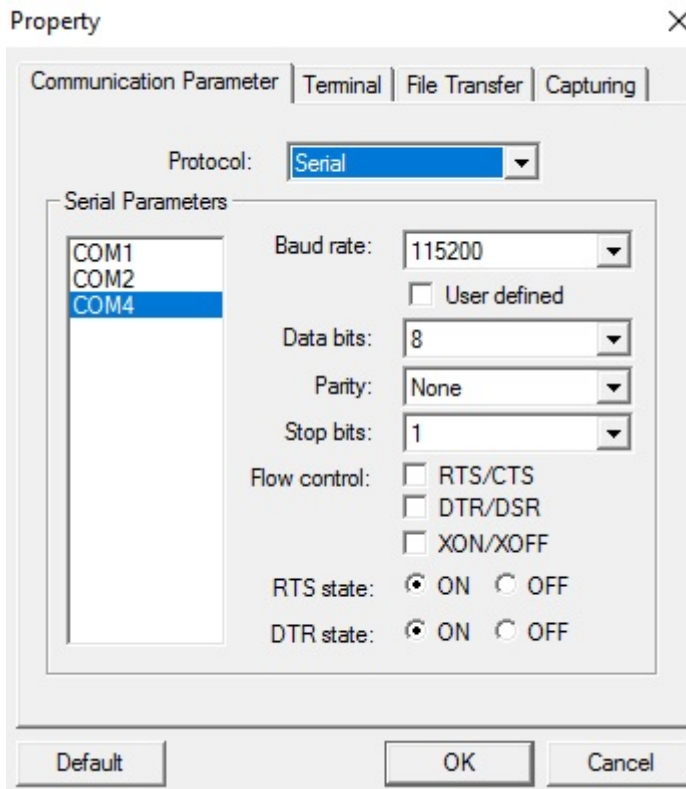
1. Prepare the included RS-232 serial cable with RJ45 interface.
2. Connect the RJ45 interface end to the console port on the switch, and the other end to the computer.
3. Download the **PComm Terminal Emulator** from the Moxa website and install the software.
4. In Windows, click **Start > Moxa > PComm Terminal Emulator**.



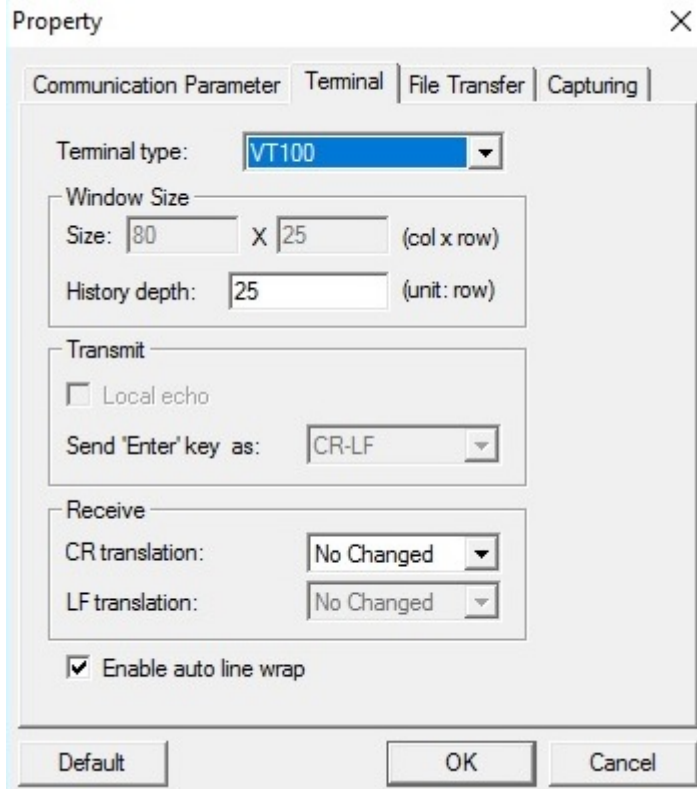
5. Click **Port Manager > Open** to establish a new connection. The Property window will appear.



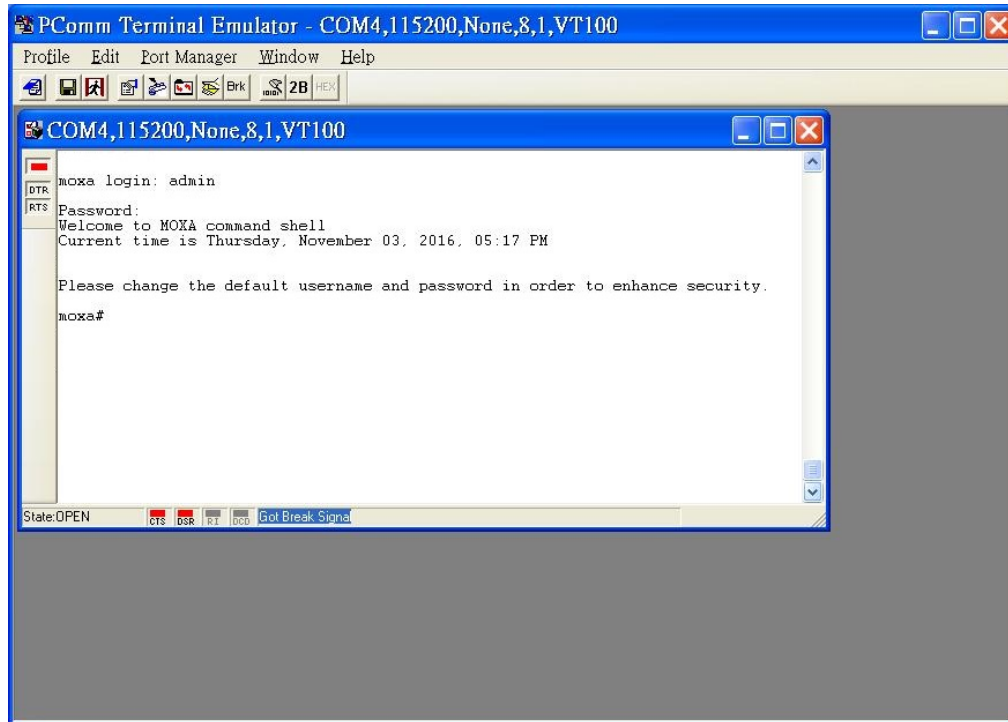
- On the **Communication Parameter** tab, select the COM port that will be used for the console connection. Configure the fields as follows: **115200** for **Baud rate**, **8** for **Data bits**, **None** for **Parity**, and **1** for **Stop bits**.



- On the **Terminal** tab, select **VT100** as the **Terminal Type**, and click **OK** to continue.



- Log in to the console using the default login name **admin** and password **moxa**. This password will be required to access any of the consoles (web, serial, Telnet).



- When successfully connected to the switch, you can start configuring the switch parameters by using command line instructions.

**NOTE** By default, the password assigned to the Moxa switch is **moxa**. We recommended changing the default password after logging in for the first time to help keep your system secure.



## Logging in using Telnet

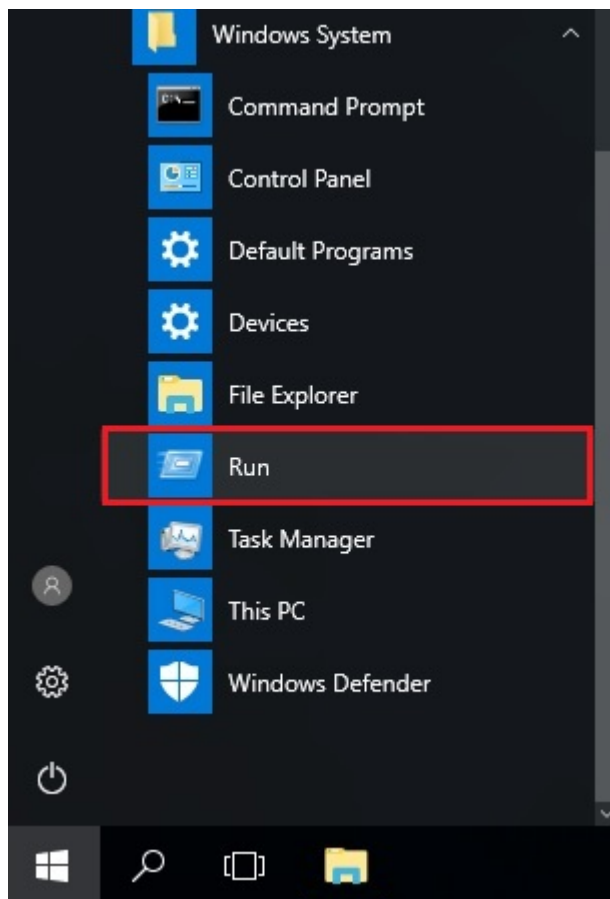
Opening the Moxa switch's Telnet or web console over a network requires that the PC host and Moxa switch are on the same logical subnet. You may need to adjust your PC host's IP address and subnet mask. By default, the Moxa switch's IP address is **192.168.127.253** and the subnet mask is **255.255.255.0**. Your PC's IP address must be configured with an IP in the 192.168.127.xxx and a subnet mask 255.255.255.0.

**NOTE** When connecting to the Moxa switch's through Telnet or the web console, first connect one of the Moxa switch's Ethernet ports to your Ethernet LAN, or directly to your PC's Ethernet port. You may use either a straight-through or cross-over Ethernet cable.

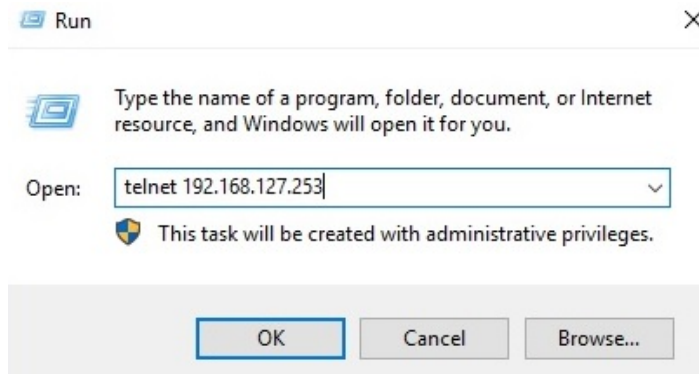
**NOTE** The Moxa switch's default IP address is 192.168.127.253 with subnet mask 255.255.255.0.

After making sure that the Moxa switch is connected to the same LAN and logical subnet as your PC, open the Moxa switch's Telnet console as follows:

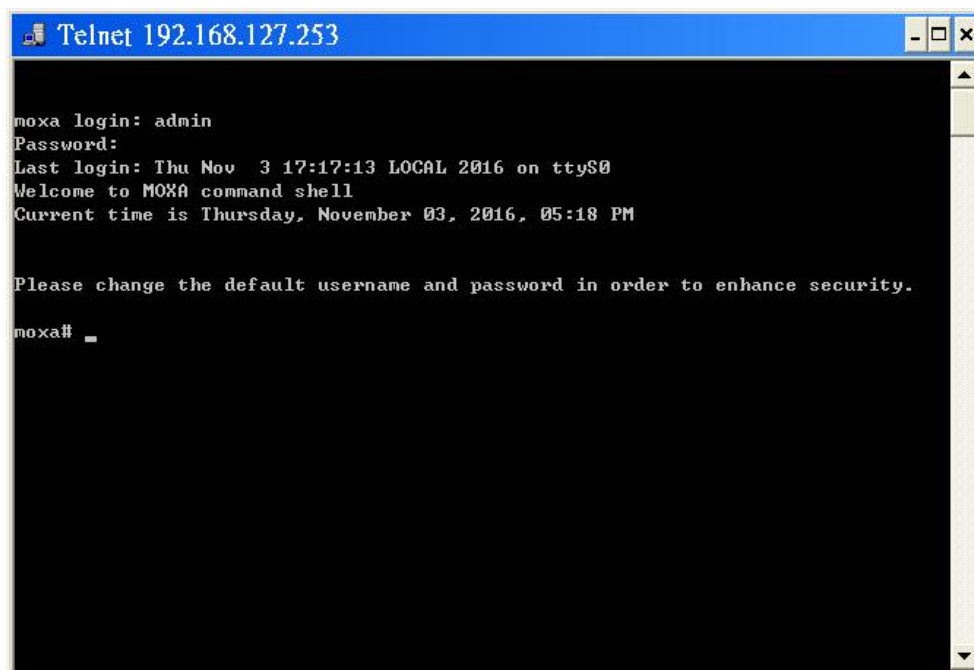
1. In Windows, click **Start > Run**.



2. In the Windows Run window, enter **telnet** followed by the Moxa switch's IP address (192.168.127.253). You can also issue the Telnet command from a DOS prompt.



3. Log in to the Telnet console using the default login name **admin** and password **moxa**. This password will be required to access any of the consoles (web, serial, Telnet).



4. When successfully connected to the switch, you can start configuring the switch parameters by using command line instructions.

**NOTE** By default, the password assigned to the Moxa switch is **moxa**. We recommended changing the default password after logging in for the first time to help keep your system secure.

# Command Modes

## Basic Configuration

The CLI (Command Line Interface) for Moxa's Managed switches can be accessed through either the serial console or the Telnet console. For either type of connection, access to the CLI is generally referred to as an EXEC session.

The CLI is organized using different configuration levels. When you first enter the CLI, type "?" to view a list of basic commands and a description of each function. Type any of the commands shown on the screen to access the next configuration level. The help panel can be accessed from any configuration level by typing "?". The switch will show all the commands for the current configuration mode.

```
moxa# ?
clear          Clear the specified parameters
cli           Configure the CLI display parameters
configure     Enter configuration mode
copy         Perform copy operation
end          Exit to the privileged Exec (#) mode
exit        Exit the session
help       Display help for the command
locator   Activate device locator so that the LED on the
          device blinks
logout    Terminate the session
ping     Ping a target to check its status
relay   Relay related command
reload  Halt and perform a warm restart
show   Display configuration / statistics / general
       information
moxa#
```

## Understanding All Command Modes

The Moxa switch's CLI supports multiple types of configuration levels for performing different functions. Refer to the following table for an overview of all available modes.

Mode	Access Method	Prompt	Exit Method	About This Mode
User EXEC	Begin a new session and login as <b>user</b> .	moxa>	Enter the <b>exit</b> command. This will return you to the previous configuration mode.	Use this mode to display system information.
Privileged EXEC	Begin a session and login as <b>admin</b> .	moxa #	Enter the <b>exit</b> command. This will return you to the previous configuration mode.	Use this mode to verify commands that you have entered.
Global configuration	Enter the <b>configure</b> command while in Privileged EXEC mode.	moxa (config)#	Enter the <b>exit</b> command. This will return you to the previous configuration mode.	Use this mode to configure parameters that will apply to the entire switch.
Interface configuration	While in global configuration mode, enter the <b>interface</b> command, followed	moxa (config-if)#	Enter the <b>exit</b> command. This will return you to the previous configuration mode.	Use this mode to configure parameters for the specified interface.

	by an interface identification.			
--	---------------------------------	--	--	--

Refer to the following example of changing configuration modes below.

Type **config** at the command prompt to enter configuration mode.

```
moxa# config
moxa(config)#
```

Type **exit** to return to the previous configuration mode.

```
moxa(config)# exit
moxa#
```

Type **end** from within any configuration level to return to privileged Exec mode.

```
moxa(config)# end
moxa#
```

## Help Messages

The CLI supports several types of interactive commands. The **Help** commands are listed in the following table:

Command	Purpose
?	Shows a brief description of the Help feature in any command level.
Partial command?	Shows a list of commands that begin with the entered character string. There should be no space between the command and the question mark.
Partial command<Tab>	Completes a partially entered command name. There should be no space between the command and <Tab>.
Command ?	Shows the keywords, arguments, or both associated with the command. There should be a space between the command and the question mark.
Command keyword ?	Shows the arguments that are associated with the keyword. There should be a space between the command and the keyword, and between the keyword and the question mark.

## Special Usage and Limitations

If the command contains any special characters, such as **\***, **#**, and **%**, you need to use the quotation marks (") to cover these special characters. Refer to the following figure for an example.

```
moxa(config)# contact "test#"
moxa(config)# exit
moxa# show run
Building user configuration ...

! -----
! Time: 2019-08-30 18:37:01
! Model name: MDS-G4028
! Firmware version: v0.4 Build 2019_0703_1227
! Product revision: V255.255.255
! IP address: 192.168.127.253
! MAC address: 00:01:02:03:04:05
! Serial number: MOXA00000000
! Module M2 product revision: None
! Module M3 product revision: None
! Module M4 product revision: None
! Module M5 product revision: None
! Module M6 product revision: None
! Module M7 product revision: None
! -----
configure terminal
contact "test#"
interface ethernet 1/1
!
interface ethernet 1/2
--More--
```

In addition, you may use a semicolon mark (;) to separate several commands. Refer to the figure below for an example.

```
moxa(config)# hostname test;contact test2
moxa(config)#
test(config)#
```

## Abbreviated Commands

The exclamation mark "!" can be used to enter the global configuration mode, as shown in the example below.

```
moxa# !
moxa(config)#
moxa(config)#
```

In addition, you can input one or more letters to quickly see all commands starting with these letters. For example, type **c?**, all commands starting with c will be shown. Refer to the figure below as the example.

```
moxa# c?
clear
cli
configure
copy
```

In addition, when pressing **Tab** after typing the prefix letter, the syntax of the commands starting with that letter will be shown. See the figure below for details.

```
moxa# c
EXEC commands :

  clear logging event-log
  clear screen
  clear spanning-tree detected protocols interface { <interface-type> <interface
-id> | port-channel <integer> }
  clear statistics [interfaces {port-channel <integer> | <interface-type> <inter
face-id> }]
  cli eth-index-naming { modular | non-modular }
  cli pagination turn {on | off}
  configure [ terminal ]
  copy event-log {tftp://server/filename | sftp://<user-name>:<pass-word>@server
/filename}
  copy running-config startup-config
  copy running-config {tftp://server/filename | sftp://<user-name>:<pass-word>@s
erver/filename} [included-default] [password <string(60)>]
  copy startup-config {tftp://server/filename | sftp://<user-name>:<pass-word>@s
erver/filename} [included-default] [password <string(60)>]
  copy { tftp://server/filename running-config | sftp://<user-name>:<pass-word>@
server/filename running-config } [password decrypt-password]
  copy { tftp://server/filename | sftp://<user-name>:<pass-word>@server/filename
--More--
```

## No and Default Forms of Commands

A “no” command can be used to perform the “delete”, “disable”, or “reset to default” functions. Type “no ?” to check how parameters can be used.

```
moxa(config)# no ?
contact          Reset the contact information of the device
description      Reset the description of the device
dot1x            Configure dot1x parameters
event-notification Configure event notification parameters
hostname         Reset the hostname of the device
interface        Configure interface parameters
ip              Configure IP parameters
ipv6            Configure IPv6 parameters
lldp            Configure LLDP parameters
location         Reset the location information of the device
logging          Configure logging parameters
logging-server   Logging server parameters
login           Configure login related configuration
mac-address-table Configure MAC address table parameters
management      Configure management parameters
monitor         Configure Port Mirror parameters
ntp             Configure NTP/SNTP parameters
poe             Configure PoE parameters
port-channel     Configure port-channel parameters
radius-server    Configure RADIUS server configuration
--More--
```

The following example shows how a “no” command can run the “reset to default” function.

```
moxa(config)# hostname test
moxa(config)#
test(config)# no hostname
test(config)#
moxa(config)#
```

The following example shows how “no” can run the “disable” function.

```
moxa(config-if)# gvrp
moxa(config-if)# no gvrp
moxa(config-if)#
```

## CLI Error Messages

You may encounter some error messages while configuring Moxa’s Ethernet switch. Refer the following table for an overview of error messages and solutions.

Error Message	Meaning	Solution
% Ambiguous command	The characters you entered are insufficient for the switch to recognize the command.	Re-enter the command with a space between the command and the question mark (?). The possible keywords with the command will appear.
% Incomplete command	The keywords or values you entered are incomplete.	Re-enter the command with a space between the command and the question mark (?). The possible keywords with the command will appear.
% Invalid input detected at '^' marker.	The command you entered is incorrect. The point of invalid input will be indicated by a caret (^).	Enter a question mark (?) to display all the available commands in this command mode. The possible keywords with the command will appear.





## **Command History**

Use the Up arrow and Down arrow keys to show to cycle through the history of previously entered commands.

Pressing the Up arrow will display the previously entered command. Pressing the Down arrow will display the next command in the history.

This chapter covers all commands for users to configure Moxa's managed Ethernet switch.

The following topics are covered in this chapter:

□ **System**

- System Management
- Account Management
- Network
- Time

□ **Port**

- Port Interface
- Link Aggregation
- PoE

□ **Layer 2 Switching**

- VLAN
- MAC
- QoS
- Multicast

□ **Network Redundancy**

- Layer 2 Redundancy

□ **Management**

- Network Management

□ **Security**

- Device Security
- Network Security
- Authentication

□ **Diagnostics**

- System Status
- Event Notification
- Diagnosis
- Maintenance and Tool

# System

## System Management

### Information Setting

#### Configure Device Hostname

##### Commands

**hostname** text

**no hostname**

Syntax Description	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>hostname</b>	Configure the device hostname parameters
	device-name	The hostname of the device consisting of lower case letters, numbers, and hyphens
Defaults	hostname: moxa	
Command Modes	Global Configuration	
Usage Guidelines	N/A	
Examples	moxa# configure terminal moxa(config)# hostname device-name device-name(config)# no hostname moxa(config)#	
Error Messages	N/A	
Related Commands	N/A	

#### Configure Device Description

##### Commands

**description** text

**no description**

Syntax Description	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>description</b>	Configure the device description parameters
	text	The description of the device
Defaults	N/A	
Command Modes	Global Configuration	
Usage Guidelines	N/A	
Examples	moxa# configure terminal moxa(config)# description "description data" moxa(config)# no description	
Error Messages	N/A	
Related Commands	N/A	

## Configure Contact Information

### Commands

**contact** text

**no contact**

Syntax Description	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>contact</b>	Configure device contact information
	text	The contact information of the device
Defaults	N/A	
Command Modes	Global Configuration	
Usage Guidelines	N/A	
Examples	moxa# configure terminal moxa(config)# contact "contact info" moxa(config)# no contact	
Error Messages	N/A	
Related Commands	N/A	

## Show Location Information

### Commands

**location** text

**no location**

Syntax Description	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>location</b>	Configure the device location information
	text	The location information of the device
Defaults	N/A	
Command Modes	Global Configuration	
Usage Guidelines	N/A	
Examples	moxa# configure terminal moxa(config)# location "location info" moxa(config)# no location	
Error Messages	N/A	
Related Commands	N/A	

## Show System Information

### Commands

#### show system information

Syntax Description	<b>show</b>	Display configuration/status information
	<b>system</b>	Display system information
	<b>information</b>	Display system information
Defaults	N/A	
Command Modes	User EXEC Privileged EXEC	
Usage Guidelines	N/A	
Examples	<pre>moxa# show system information  Hardware Version           : V0.0.0 Firmware Version          : v0.3 build 2019_050202111 Device Contact             : Device Name                : moxa Device Location            : Device Description         : Device Uptime              :0 Days, 1 Hrs, 35 Mins, 21 Secs Login Authentication Mode  : Local</pre>	
Error Messages	N/A	
Related Commands	N/A	

## Firmware Upgrade

### Upgrade the Firmware

#### Commands

#### copy { tftp\_url | sftp\_url> } device-firmware

Syntax Description	<b>copy</b>	Copy the target file or input
	<b>device-firmware</b>	The system firmware
	tftp_url	The address of the remote TFTP server in the format "tftp://server/filename"
	sftp_url	The address of the remote SFTP server in the format "sftp://username:password@server/filename"
Defaults	N/A	
Command Modes	Privileged EXEC	
Usage Guidelines	N/A	
Examples	<pre>copy tftp://192.168.127.2/FWR_TSN-G5000_v0.1_2019_0904_1452.rom device- firmware</pre>	
Error Messages	N/A	
Related Commands	N/A	

## Configuration Backup and Restore

### Copy Running Configuration

#### Commands

**copy running-config** { <tftp\_url> | <sftp\_url> }

**copy** { <tftp\_url> | <sftp\_url> } **running-config**

Syntax Description	<b>copy</b>	Copy the target file or input
	<b>running-config</b>	The running configuration to be copied
	tftp_url	The location of the file to be copied on the remote TFTP server
	sftp_url	The location of the file to be copied on the remote SFTP server
Defaults	N/A	
Command Modes	Privileged EXEC	
Usage Guidelines	N/A	
Examples	copy running-config tftp://192.168.127.2 copy tftp://192.168.127.2 running-config	
Error Messages	N/A	
Related Commands	N/A	

### Copy Startup Configuration

#### Commands

**copy startup-config** { <tftp\_url> | <sftp\_url> }

**copy** { <tftp\_url> | <sftp\_url> } **startup-config**

Syntax Description	<b>copy</b>	Copy the target file or input
	<b>startup-config</b>	The startup configuration to be copied
	tftp_url	The location of the file to be copied on the remote TFTP server
	sftp_url	The location of the file to be copied on the remote SFTP server
Defaults	N/A	
Command Modes	Privileged EXEC	
Usage Guidelines	N/A	
Examples	copy startup-config tftp://192.168.127.2 copy tftp://192.168.127.2 startup-config	
Error Messages	N/A	
Related Commands	N/A	

## Event Log Backup

### Commands

**copy event-log** { <tftp\_url> | <sftp\_url> }

Syntax Description	<b>copy</b>	Copy the target file or input
	<b>event-log</b>	The system event log to be copied
	tftp_url	The address of the remote TFTP server in the format "tftp://server/filename"
	sftp_url	The address of the remote SFTP server in the format "sftp://username:password@server/filename"
Defaults	N/A	
Command Modes	Privileged EXEC	
Usage Guidelines	N/A	
Examples	copy event-log tftp://192.168.127.2	
Error Messages	N/A	
Related Commands	N/A	

## Account Management

### User Account

#### Configure User Account Setting

### Commands

**username** <username> **password** <passwd> **group** { admin | user | supervisor } **status** { enable | disable } **email** <email>  
**no username** username

Syntax Description	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>username</b>	Configures username parameters
	username	The username to be used for login
	<b>password</b>	Configures password parameters
	password	The password to be entered by the user
	<b>group</b>	Configures the user privilege level
	group	Valid values are "admin", "supervisor", and "user" "admin" for admin group, "supervisor" for supervisor, and "user" for normal user group
	<b>status</b>	Configures user status parameters
	enable	Enable the user
	disable	Disable the user
Syntax Description	<b>email</b>	Configures the user email
	email	The user's email address
Defaults	N/A.	
Command Modes	Global configuration	
Usage Guidelines	N/A	
Examples	(config)# username testuser password test123 group admin status enable email test@test.com	
Error Messages	% Max User Account Amount Reached % Invalid Username Format % Password doesn't comply with password rules. % Invalid Email Format	

	% Invalid Password Format % User does not exist % At least one admin should be active. % User status cannot be updated by self. % User Deletion Failed % User cannot be disabled by self % User cannot be modified group by self % User cannot be deleted by self
Related Commands	Show user

## Show User Information

### Commands

#### show user

Syntax Description	<b>show</b>	Display running information for the function
	<b>user</b>	Display user parameters
Defaults	N/A	
Command Modes	Global configuration/ User EXEC	
Usage Guidelines	N/A	
Examples	<pre># show user USER           ACTIVE           PRIVILEGE           EMAIL admin           1                 admin                admin@sample.com user            1                 user                 user@sample.com supervisor     1                 supervisor           supervisor@sample.com</pre>	
Error Messages	N/A	
Related Commands	username	

## Password Policy

### Configure Password Maximum Lifetime

#### Commands

#### password max-life-time [<days (0-365)>]

Syntax Description	<b>password</b>	Configure password parameters
	<b>max-life-time</b>	Configure the maximum lifetime of the password
	days	Maximum lifetime in days; a 0 or "no" value means it does not expire
Defaults	0	
Command Modes	Global configuration	
Usage Guidelines	N/A	
Examples	<pre>moxa# config moxa(config)# password max-life-time 30 moxa(config)# password max-life-time</pre>	
Error Messages	N/A	
Related Commands	show password max-life-time	



## Configure Password Validation Rules

### Commands

**password validate-rules** [lowercase] [uppercase] [numbers] [symbols]

Syntax Description	<b>password</b>	Configure password parameters
	<b>validate-rules</b>	Configure validation rules
	lowercase	Configure at least 1 lowercase flag for password validation
	uppercase	Configure at least 1 uppercase flag for password validation
	numbers	Configure at least 1 numbers flag for password validation
	symbols	Configure at least 1 symbols flag for password validation
Defaults	There are no validation rules configured by default	
Command Modes	Global configuration	
Usage Guidelines	N/A	
Examples	moxa# config moxa(config)# password validate-rules lowercase numbers moxa(config)# password validate-rules	
Error Messages	N/A	
Related Commands	show password validate-rules	

## Configure Password Minimum Length

### Commands

**password minimum-length** <minimum-len (4-63)>

Syntax Description	<b>password</b>	Configure password parameters
	<b>minimum-length</b>	Configure the minimum password length
	minimum-len	The minimum password length
Defaults	4	
Command Modes	Global configuration	
Usage Guidelines	N/A	
Examples	moxa# config moxa(config)# password minimum-length 8	
Error Messages	N/A	
Related Commands	show password minimum-length	

## Show Password Minimum Length

### Commands

**show minimum password minimum-length**

Syntax Description	<b>show</b>	Display running information for the function
	<b>password</b>	Display password parameters
	<b>minimum-length</b>	Display the minimum length of the password
Defaults	N/A	
Command Modes	Global configuration	
Usage Guidelines	N/A	
Examples	moxa# show password minimum-length 8	
Error Messages	N/A	
Related Commands	password minimum-length	

## Show Password Validation Rules

### Commands

#### show password validate-rules

Syntax Description	<b>show</b>	Display running information for the function
	<b>password</b>	Display password parameters
	<b>validate-rules</b>	Display the password validation rules
Defaults	N/A	
Command Modes	Global configuration	
Usage Guidelines	N/A	
Examples	moxa# show password validate-rules	
Error Messages	N/A	
Related Commands	password validate-rules	

## Network

### IP Configuration

#### Configure IP Management Address

### Commands

#### ip management address { dhcp | ipv4-address ipv4-netmask [ ipv4-gateway ] }

Syntax Description	<b>ip</b>	Configure IP parameters
	<b>management</b>	Configure IPv4 management address parameters
	<b>address</b>	Configure the IPv4 management address of the device
	<b>dhcp</b>	Assign the IPv4 address by DHCP
	ipv4-address	The IPv4 address
	ipv4-netmask	The IPv4 subnet mask
	ipv4-gateway	The IPv4 gateway
Defaults	ipv4-address: 192.168.127.253 ipv4-netmask: 255.255.255.0 ipv4-gateway: 0.0.0.0	
Command Modes	Global Configuration	
Usage Guidelines	N/A	
Examples	moxa# configure terminal moxa(config)# ip management address dhcp moxa(config)# ip management address 10.1.1.1 255.255.255.0 10.1.1.254	
Error Messages	Invalid: Invalid IPv4 Management Address ipv4-address/ipv4-netmask. Invalid: Gateway ipv4-gateway is not reachable.	
Related Commands	N/A	

## DHCP Server

### Show IP DHCP

#### Commands

**show ip dhcp** [ { binding | static | port-based-ip-assignment } ]

Syntax Description	<b>show</b>	Display configuration/status information
	<b>ip</b>	Display IP information
	<b>dhcp</b>	Display DHCP server information
	binding	Display binding information
	static	Display MAC-based IP assignment information
	port-based-ip-assignment	Display port-based IP assignment information
Defaults	N/A	
Command Modes	User EXEC Privileged EXEC	
Usage Guidelines	N/A	
Examples	<pre> moxa# show ip dhcp DHCP Server Mode: DHCP / MAC-based IP Assignment  DHCP Pool List ----- Index          : 1 State          : Enable First IP Address : 192.168.127.10 Last IP Address  : 192.168.127.20 Netmask        : 255.255.255.0 Lease Time (secs) : 86400 Default Gateway : NTP Server     : DNS Server 1   : DNS Server 2   :  moxa# show ip dhcp binding Host Name      IP Address      MAC Address      Time Left ----- VirtualBox    192.168.127.10  08:00:27:f6:bf:98  23 h: 59 m: 55 s  // A MAC-based IP assignment is created  moxa# show ip dhcp static DHCP Server Mode: DHCP / MAC-based IP Assignment  MAC-based IP Assignment List ----- Index          : 1 State          : Enable Host Name      : host1 Host IP Address : 192.168.127.30 Host Netmask   : 255.255.255.0 MAC Address    : 08:00:27:f6:bf:98 Lease Time (secs) : 86400 Default Gateway : NTP Server     : DNS Server 1   : DNS Server 2   : </pre>	

	<pre> moxa# show ip dhcp binding Host Name          IP Address      MAC Address      Time Left ----- host1              192.168.127.30  08:00:27:f6:bf:98 (static)  // A Port-based IP assignment is created  moxa# show ip dhcp port-based-ip-assignment DHCP Server Mode: Port-based IP Assignment  Port-based IP Assignment List ----- Port              : 2 State             : Enable Static IP Address : 192.168.127.40 Host Netmask      : 255.255.255.0 Lease Time (secs) : 86400 Default Gateway   : NTP Server        : DNS Server 1      : DNS Server 2      :  moxa# show ip dhcp binding Host Name          IP Address      MAC Address      Time Left -----                   192.168.127.40                (static)                 </pre>
Error Messages	N/A
Related Commands	N/A

### Configure/Disable DHCP Server Mode

**Commands**

**dhcp-server mode disable**

**dhcp-server mode dhcp-and-mac-based-ip-assignment**

**dhcp-server mode port-based-ip-assignment**

Syntax Description	<b>dhcp-server</b>	Configure DHCP server parameters
	<b>mode</b>	Configure DHCP server mode parameters
	<b>disable</b>	Disable the DHCP server
	<b>dhcp-and-mac-based-ip-assignment</b>	Standard DHCP server and MAC-based DHCP
	<b>port-based-ip-assignment</b>	Port-based DHCP sever
Defaults	N/A	
Command Modes	Privileged EXEC Global Configuration	
Usage Guidelines	N/A	
Examples	Moxa(config)# dhcp-server mode disable	
Error Messages	N/A	
Related Commands	N/A	

## Enable/Disable IP DHCP Pool

### Commands

**ip dhcp pool** <integer> [ { enable | disable } ]

Syntax Description	<b>ip</b>	Configure IP parameters
	<b>dhcp</b>	Configure DHCP server parameters
	<b>pool</b>	Configure address pool parameters
	<integer>	Pool number
	enable	Enable the address pool
	disable	Disable the address pool
Defaults	N/A	
Command Modes	Privileged EXEC Global Configuration	
Usage Guidelines	N/A	
Examples	moxa(config)# ip dhcp pool 1 enable moxa(dhcp-config)#	
Error Messages	N/A	
Related Commands	N/A	

## Remove IP DHCP Pool

### Commands

**no ip dhcp pool** <integer>

Syntax Description	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>ip</b>	Configure IP parameters
	<b>dhcp</b>	Configure DHCP server parameters
	<b>pool</b>	Configure address pool parameters
	<integer>	The address pool number
Defaults	N/A	
Command Modes	Privileged EXEC Global Configuration	
Usage Guidelines	N/A	
Examples	moxa# no ip dhcp pool 1	
Error Messages	N/A	
Related Commands	N/A	

## Enable/Disable IP DHCP Static Pool

### Commands

**ip dhcp static pool** <string (63)> [ { enable | disable } ]

Syntax Description	<b>ip</b>	Configure IP parameters
	<b>dhcp</b>	Configure DHCP server parameters
	<b>static</b>	Configure MAC-based IP assignment parameters
	<b>pool</b>	Configure address pool parameters
	<string (63)>	The client host name (DHCP option 12)
	enable	Enable the address pool
	disable	Disable the address pool
Defaults	N/A	
Command Modes	Privileged EXEC Global Configuration	
Usage Guidelines	N/A	
Examples	moxa(config)# ip dhcp static pool host1 enable moxa(dhcp-config)#	
Error Messages	N/A	
Related Commands	N/A	

## Remove IP DHCP Static Pool

### Commands

**no ip dhcp static pool** <string (63)>

Syntax Description	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>ip</b>	Configure IP parameters
	<b>dhcp</b>	Configure DHCP server parameters
	<b>static</b>	Configure MAC-based IP assignment parameters
	<b>pool</b>	Configure address pool parameters
	string (63)	The client host name (DHCP option 12)
Defaults	N/A	
Command Modes	Privileged EXEC Global Configuration	
Usage Guidelines	N/A	
Examples	moxa(config)# no ip dhcp static pool host1	
Error Messages	N/A	
Related Commands	N/A	

## DHCP and MAC-based IP Assignment

### Configure DHCP Server Pool

#### Commands

**network** <uicast\_addr> <uicast\_addr> <ip\_mask>

Syntax Description	<b>network</b>	Configure network parameters
	<uicast_addr>	The address pool starting IP address
	<uicast_addr>	The address pool ending IP address
	<ip_mask>	The subnet mask
Defaults	N/A	
Command Modes	Privileged EXEC DHCP Configuration	
Usage Guidelines	N/A	
Examples	moxa(dhcp-config)# network 192.168.127.10 192.168.127.20 255.255.255.0	
Error Messages	N/A	
Related Commands	N/A	

### Configure DHCP Server Host IP Address

#### Commands

**host** <uicast\_addr> <ip\_mask>

Syntax Description	<b>host</b>	Configure host parameters
	<uicast_addr>	The unicast IP address
	<ip_mask>	The subnet mask
Defaults	N/A	
Command Modes	Privileged EXEC DHCP Configuration	
Usage Guidelines	N/A	
Examples	moxa(dhcp-config)# host 192.168.127.100	
Error Messages	N/A	
Related Commands	N/A	

### Configure DHCP Server Host MAC Address

#### Commands

**hardware-address** <uicast\_mac>

Syntax Description	<b>hardware-address</b>	Configure the MAC address
	<uicast_mac>	The MAC address
Defaults	N/A	
Command Modes	Privileged EXEC DHCP Configuration	
Usage Guidelines	N/A	
Examples	moxa(dhcp-config)# hardware-address 00:90:e8:11:22:33	
Error Messages	N/A	
Related Commands	N/A	

## Configure Lease Time

### Commands

**lease** <integer (10-604800)>

Syntax Description	<b>lease</b>	Configure the IP lease duration
	<integer (10-604800)>	The IP lease duration in seconds
Defaults	N/A	
Command Modes	Privileged EXEC DHCP Configuration	
Usage Guidelines	N/A	
Examples	moxa(dhcp-config)# lease 3600	
Error Messages	N/A	
Related Commands	N/A	

## Reset Lease time

### Commands

**no lease**

Syntax Description	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>lease</b>	Configure the IP lease duration
Defaults	N/A	
Command Modes	Privileged EXEC DHCP Configuration	
Usage Guidelines	N/A	
Examples	moxa(dhcp-config)# no lease	
Error Messages	N/A	
Related Commands	N/A	

## Configure Default Router IP Address

### Commands

**default-router** <ucast\_addr>

Syntax Description	<b>default-router</b>	Configure the default router
	<ucast_addr>	The unicast IP address
Defaults	N/A	
Command Modes	Privileged EXEC DHCP Configuration	
Usage Guidelines	N/A	
Examples	moxa(dhcp-config)# default-router 192.168.127.254	
Error Messages	N/A	
Related Commands	N/A	



## Remove Default Router IP Address

### Commands

#### no default-router

Syntax Description	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>default-router</b>	Configure the default router
Defaults	N/A	
Command Modes	Privileged EXEC DHCP Configuration	
Usage Guidelines	N/A	
Examples	moxa(dhcp-config)# no default-router	
Error Messages	N/A	
Related Commands	N/A	

## Configure DNS Server IP Address

### Commands

#### dns-server <ucast\_addr> [ <ucast\_addr> ]

Syntax Description	<b>dns-server</b>	Configure the DNS server
	<ucast_addr>	The unicast IP address
	<ucast_addr>	The unicast IP address
Defaults	N/A	
Command Modes	Privileged EXEC DHCP Configuration	
Usage Guidelines	N/A	
Examples	moxa(dhcp-config)# dns-server 192.168.127.254 moxa(dhcp-config)# dns-server 192.168.127.251 192.168.127.252	
Error Messages	N/A	
Related Commands	N/A	

## Remove DNS Server IP Address

### Commands

#### no dns-server

Syntax Description	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>dns-server</b>	Configure the DNS server
Defaults	N/A	
Command Modes	Privileged EXEC DHCP Configuration	
Usage Guidelines	N/A	
Examples	moxa(dhcp-config)# no dns-server	
Error Messages	N/A	
Related Commands	N/A	

## Configure NTP Server IP Address

### Commands

**ntp-server** <ucast\_addr>

Syntax Description	<b>ntp-server</b>	Configure the NTP server
	<ucast_addr>	The unicast IP address
Defaults	N/A	
Command Modes	Privileged EXEC DHCP Configuration	
Usage Guidelines	N/A	
Examples	moxa(dhcp-config)# ntp-server 192.168.127.254	
Error Messages	N/A	
Related Commands	N/A	

## Remove NPT Server IP Address

### Commands

**no ntp-server**

Syntax Description	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>ntp-server</b>	Configure the NTP server
Defaults	N/A	
Command Modes	Privileged EXEC DHCP Configuration	
Usage Guidelines	N/A	
Examples	moxa(dhcp-config)# no ntp-server	
Error Messages	N/A	
Related Commands	N/A	

## Configure Port-based IP Assignment

### Commands

**ip dhcp port-based-ip-assignment** <ucast\_addr> <ip\_mask>

Syntax Description	<b>ip</b>	Configure IP parameters
	<b>dhcp</b>	Configure DHCP server parameters
	<b>port-based-ip-assignment</b>	Configure port-based IP assignment parameters
	<ucast_addr>	The unicast IP address
	<ip_mask>	The subnet mask
Defaults	N/A	
Command Modes	Privileged EXEC Interface Configuration	
Usage Guidelines	N/A	
Examples	moxa(config)# interface ethernet 1/2 moxa(config-if)# ip dhcp port-based-ip-assignment 192.168.127.100 255.255.255.0	
Error Messages	N/A	
Related Commands	N/A	

## Remove Port-based IP Assignment

### Commands

#### **no ip dhcp port-based-ip-assignment**

Syntax Description	<b>no</b>	Remove configuration / delete entry / reset to default value
	<b>ip</b>	Configure IP parameters
	<b>dhcp</b>	Configure DHCP server parameters
	<b>port-based-ip-assignment</b>	Configure port-based IP assignment parameters
Defaults	N/A	
Command Modes	Privileged EXEC Interface Configuration	
Usage Guidelines	N/A	
Examples	moxa(config)# interface ethernet 1/2 moxa(config-if)# no ip dhcp port-based-ip-assignment	
Error Messages	N/A	
Related Commands	N/A	

## Enable/Disable Port-based IP Assignment

### Commands

#### **ip dhcp port-based-ip-assignment { enable | disable }**

Syntax Description	<b>ip</b>	Configure IP parameters
	<b>dhcp</b>	Configure DHCP server parameters
	<b>port-based-ip-assignment</b>	Configure port-based IP assignment parameters
	enable	Enable port-based IP assignment
	disable	Disable port-based IP assignment
Defaults	N/A	
Command Modes	Privileged EXEC Interface Configuration	
Usage Guidelines	N/A	
Examples	moxa(config)# interface ethernet 1/2 moxa(config-if)# ip dhcp port-based-ip-assignment enable moxa(config-if)# ip dhcp port-based-ip-assignment disable	
Error Messages	N/A	
Related Commands	N/A	

## Configure Port-based IP Assignment Parameters

### Commands

**ip dhcp port-based-ip-assignment** { { lease <integer (10-604800)> } | { default-router <ucast\_addr> } } | { dns-server <ucast\_addr> [ <ucast\_addr> ] } | { ntp-server <ucast\_addr> } }

Syntax Description	<b>ip</b>	Configure IP parameters
	<b>dhcp</b>	Configure DHCP server parameters
	<b>port-based-ip-assignment</b>	Configure port-based IP assignment parameters
	<b>lease</b>	Configure duration of lease
	<integer (10-604800)>	The duration of the lease in seconds
	default-router	Configure the default router
	<ucast_addr>	The unicast IP address
	dns-server	Configure the DNS server
	<ucast_addr>	The primary DNS server IP address
	<ucast_addr>	The secondary DNS server IP address
	ntp-server	Configure the NTP server
	<ucast_addr>	The unicast IP address
Defaults	N/A	
Command Modes	Privileged EXEC Interface Configuration	
Usage Guidelines	N/A	
Examples	<pre>moxa(config-if)# ip dhcp port-based-ip-assignment lease 3600 moxa(config-if)# ip dhcp port-based-ip-assignment default-router 192.168.127.254 moxa(config-if)# ip dhcp port-based-ip-assignment dns-server 192.168.127.254 moxa(config-if)# ip dhcp port-based-ip-assignment dns-server 192.168.127.251 192.168.127.252 moxa(config-if)# ip dhcp port-based-ip-assignment ntp-server 192.168.127.254</pre>	
Error Messages	N/A	
Related Commands	N/A	

## Remove Port-based IP Assignment Parameters

### Commands

**no ip dhcp port-based-ip-assignment** { lease | default-router | dns-server | ntp-server }

Syntax Description	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>ip</b>	Configure IP parameters
	<b>dhcp</b>	Configure DHCP server parameters
	<b>port-based-ip-assignment</b>	Configure port-based IP assignment parameters
	lease	Configure the IP lease duration
	default-router	Configure the default router
	dns-server	Configure the DNS server
	ntp-server	Configure the NTP server
Defaults	N/A	
Command Modes	Privileged EXEC Interface Configuration	
Usage Guidelines	N/A	
Examples	<pre>moxa(config-if)# no ip dhcp port-based-ip-assignment lease moxa(config-if)# no ip dhcp port-based-ip-assignment default-router moxa(config-if)# no ip dhcp port-based-ip-assignment dns-server moxa(config-if)# no ip dhcp port-based-ip-assignment ntp-server</pre>	
Error Messages	N/A	

Related Commands	N/A
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## Time

### Time Zone

#### Configure Clock Time Zone

##### Commands

**clock timezone** { "-12" | "-11" | "-10" | "-9:30" | "-9" | "-8" | "-7" | "-6" | "-5" | "-4" | "-3:30" | "-3" | "-2" | "-1" | "0" | "1" | "2" | "3" | "3:30" | "4" | "4:30" | "5" | "5:30" | "5:45" | "6" | "6:30" | "7" | "8" | "8:30" | "8:45" | "9" | "9:30" | "10" | "10:30" | "11" | "12" | "12:45" | "13" | "14" }

Syntax Description	<b>clock</b>	Configure system clock parameters
	<b>timezone</b>	Configure the timezone
	"-12"	UTC-12:00
	"-11"	UTC-11:00
	"-10"	UTC-10:00
	"-9:30"	UTC-09:30
	"-9"	UTC-09:00
	"-8"	UTC-08:00
	"-7"	UTC-07:00
	"-6"	UTC-06:00
	"-5"	UTC-05:00
	"-4"	UTC-04:00
	"-3:30"	UTC-03:30
	"-3"	UTC-03:00
	"-2"	UTC-02:00
	"-1"	UTC-01:00
	"0"	UTC+00:00
	"1"	UTC+01:00
	"2"	UTC+02:00
	"3"	UTC+03:00
	"3:30"	UTC+03:30
	"4"	UTC+04:00
	"4:30"	UTC+04:30
	"5"	UTC+05:00
	"5:30"	UTC+05:30
	"5:45"	UTC+05:45
	"6"	UTC+06:00
	"6:30"	UTC+06:30
	"7"	UTC+07:00
	"8"	UTC+08:00
	"8:30"	UTC+08:30
	"8:45"	UTC+08:45
	"9"	UTC+09:00
	"9:30"	UTC+09:30
	"10"	UTC+10:00
	"10:30"	UTC+10:30
	"11"	UTC+11:00
	"12"	UTC+12:00

	"12:45"	UTC+12:45
	"13"	UTC+13:00
	"14"	UTC+14:00
Defaults	N/A	
Command Modes	Global Configuration	
Usage Guidelines	N/A	
Examples	moxa# configure terminal moxa(config)# clock timezone "8"	
Error Messages	N/A	
Related Commands	N/A	

## System Time

### Configure Clock Source

#### Commands

**clock source** { local | ntp | sntp }

Syntax Description	<b>clock</b>	Configure system clock parameters
	<b>source</b>	Configure the source of the system clock
	local	Use the local clock
	ntp	Use Network Time Protocol (NTP)
	sntp	Use Simple Network Time Protocol (SNTP)
Defaults	clock source: local	
Command Modes	Global Configuration	
Usage Guidelines	N/A	
Examples	moxa# configure terminal moxa(config)# clock source local	
Error Messages	N/A	
Related Commands	N/A	

### Configure Clock Setting

#### Commands

**clock set** hh:mm:ss [ month ] [ day ] [ year ]

Syntax Description	<b>clock</b>	Configure system clock parameters
	<b>set</b>	Configure the system time
	hh:mm:ss	The system time in the format hh:mm:ss
	month	The month, January (1) to December (12)
	day	The day of the month (1 to 31)
	year	The year
Defaults	N/A	
Command Modes	Global Configuration	
Usage Guidelines	N/A	
Examples	moxa# configure terminal moxa(config)# clock set 11:11:11 12 31 2019	
Error Messages	N/A	
Related Commands	N/A	

## Enable Clock Summer Time

### Commands

#### clock summer-time enable

Syntax Description	<b>clock</b>	Configure system clock parameters
	<b>summer-time</b>	Configure Daylight Savings Time parameters
	<b>enable</b>	Enable Daylight Savings Time
Defaults	Daylight saving time is disabled by default	
Command Modes	Global Configuration	
Usage Guidelines	N/A	
Examples	moxa# configure terminal moxa(config)# clock summer-time enable	
Error Messages	Invalid: The start date plus offset should before the end date.	
Related Commands	N/A	

## Disable Clock Summertime

### Commands

#### clock summer-time disable

Syntax Description	<b>clock</b>	Configure system clock parameters
	<b>summer-time</b>	Configure Daylight Savings Time parameters
	<b>disable</b>	Disable Daylight Savings Time
Defaults	Daylight saving time is disabled by default	
Command Modes	Privileged EXEC Global Configuration	
Usage Guidelines	N/A	
Examples	moxa# configure terminal moxa(config)# clock summer-time disable	
Error Messages	N/A	
Related Commands	N/A	

## Configure Clock Summertime Start Date

### Commands

#### clock summer-time start-date [ month ] [ day ] [ year ] [hour minute hh:mm:ss ]

Syntax Description	<b>clock</b>	Configure system clock parameters
	<b>summer-time</b>	Configure Daylight Savings Time parameters
	<b>start-date</b>	Configure the start date of Daylight Saving Time
	month	The month, January (1) to December (12)
	day	The day of the month (1 to 31)
	year	The year
	hour	The hour
	minute	The minutes
Defaults	The daylight saving time start date is set to Jan 01 2000 00:00	
Command Modes	Global Configuration	
Usage Guidelines	N/A	
Examples	moxa# configure terminal moxa(config)# clock summer-time start-date 1 1 2019 23 30	
Error Messages	Invalid: Start date is invalid. Invalid: The start date plus offset should before the end date.	
Related Commands	N/A	

## Configure Clock Summertime End Date

### Commands

**clock summer-time start-date** month day year hour minute

Syntax Description	<b>clock</b>	Configure system clock parameters
	<b>summer-time</b>	Configure Daylight Savings Time parameters
	<b>end-date</b>	Configure the end date of Daylight Savings Time
	month	The month, January (1) to December (12)
	day	The day of the month (1 to 31)
	year	The year
	hour	The hour
	minute	The minutes
Defaults	The daylight saving time end date is set to Dec 31 2000 23:00	
Command Modes	Global Configuration	
Usage Guidelines	N/A	
Examples	moxa# configure terminal moxa(config)# clock summer-time end-date 7 31 2019 23 30	
Error Messages	Invalid: End date is invalid Invalid: The start date plus offset should before the end date.	
Related Commands	N/A	

## Configure Clock Summertime Offset

### Commands

**clock summer-time offset** offset-hour [ offset-minute ]

Syntax Description	<b>clock</b>	Configure system clock parameters
	<b>summer-time</b>	Configure Daylight Savings Time parameters
	<b>offset</b>	Configure the offset of Daylight Saving Time
	offset-hour	The time offset hours
	offset-minute	The time offset minutes
Defaults	daylight saving time offset: 0 Hour 0 Minutes	
Command Modes	Global Configuration	
Usage Guidelines	N/A	
Examples	moxa# configure terminal moxa(config)# clock summer-time offset 1 30	
Error Messages	Invalid: The start date plus offset should before the end date.	
Related Commands	N/A	



## Configure NTP Authentication Key

### Commands

**ntp authentication-key** key-index key-id md5 key-string

**no ntp authentication-key** key-index

Syntax Description	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>ntp</b>	Configure NTP/SNTP parameters
	<b>authentication-key</b>	Configure the NTP authentication key
	key-index	The index of the key, ranging from 1 to 10
	key-id	The key ID, ranging from 1 to 65535
	md5	Use MD5 authentication
	key-string	The authentication key with a maximum length of 32 characters for plain text, 66 characters for Moxa-encrypted hex
Defaults	N/A	
Command Modes	Global Configuration	
Usage Guidelines	N/A	
Examples	<pre>moxa# configure terminal moxa(config)# ntp authentication-key 1 1 md5 1a2b3c4d moxa(config)# no ntp authentication-key 1</pre>	
Error Messages	Invalid: Authentication key ID <i>key-id</i> is duplicated.	
Related Commands	N/A	

## Configure NTP Remote Server

### Commands

**ntp remote-server ntp** server-index server-address [ authentication key key-id ]

**no ntp remote-server ntp** server-index [ authentication ]

Syntax Description	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>ntp</b>	Configure NTP/SNTP parameters
	<b>remote-server</b>	Configure remote time server parameters
	<b>ntp</b>	Configure NTP server parameters
	server-index	The index of the server, ranging from 1 to 2
	server-address	The NTP server address
	authentication	Configure NTP authentication parameters
	key	Use key authentication
	key-id	The ID of the authentication key
Defaults	NTP time server: time.nist.gov	
Command Modes	Global Configuration	
Usage Guidelines	N/A	
Examples	<pre>moxa# configure terminal moxa(config)# ntp remote-server ntp 1 1.1.1.1 moxa(config)# ntp remote-server ntp 2 2.2.2.2 authentication key 1 moxa(config)# no ntp remote-server ntp 2 authentication moxa(config)# no ntp remote-server ntp 1</pre>	
Error Messages	Invalid: Authentication key ID <i>key-id</i> of NTP client <i>server-index</i> does not exist.	
Related Commands	N/A	

## Configure SNTP Remote Server

### Commands

**ntp remote-server sntp** server-index server-address

**no ntp remote-server sntp** server-index server-address

Syntax Description	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>ntp</b>	Configure NTP/SNTP parameters
	<b>remote-server</b>	Configure remote time server parameters
	<b>sntp</b>	Configure SNTP server parameters
	server-index	The index of the server, ranging from 1 to 2
	server-address	The SNTP server address
Defaults	The default SNTP time server is set to time.nist.gov	
Command Modes	Global Configuration	
Usage Guidelines	N/A	
Examples	<pre>moxa# configure terminal moxa(config)# ntp remote-server sntp 1 1.1.1.1 moxa(config)# no ntp remote-server sntp 1</pre>	
Error Messages	N/A	
Related Commands	N/A	

## Enable NTP Server

### Commands

**ntp server enable**

Syntax Description	<b>ntp</b>	Configure NTP/SNTP parameters
	<b>server</b>	Configure NTP server parameters
	<b>enable</b>	Enable the NTP server
Defaults	NTP server: disable	
Command Modes	Global Configuration	
Usage Guidelines	N/A	
Examples	<pre>moxa# configure terminal moxa(config)# ntp server enable</pre>	
Error Messages	N/A	
Related Commands	N/A	

## Disable NTP Server

### Commands

**ntp server disable**

Syntax Description	<b>ntp</b>	Configure NTP/SNTP parameters
	<b>server</b>	Configure NTP server parameters
	<b>disable</b>	Disable the NTP server
Defaults	The NTP server is disabled by default	
Command Modes	Global Configuration	
Usage Guidelines	N/A	
Examples	<pre>moxa# configure terminal moxa(config)# ntp server disable</pre>	
Error Messages	N/A	
Related Commands	N/A	

## Configure NTP Server Authentication

### Commands

#### ntp server authentication

Syntax Description	<b>ntp</b>	Configure NTP/SNTP parameters
	<b>server</b>	Configure NTP server parameters
	<b>authentication</b>	Enable authentication
Defaults	NTP server authentication is disabled by default	
Command Modes	Global Configuration	
Usage Guidelines	N/A	
Examples	moxa# configure terminal moxa(config)# ntp server authentication	
Error Messages	N/A	
Related Commands	N/A	

## Disable NTP Server Authentication

### Commands

#### no ntp server authentication

Syntax Description	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>ntp</b>	Configure NTP/SNTP parameters
	<b>server</b>	Configure NTP server parameters
	<b>authentication</b>	NTP authentication
Defaults	NTP server authentication is disabled by default	
Command Modes	Global Configuration	
Usage Guidelines	N/A	
Examples	moxa# configure terminal moxa(config)# no ntp server authentication	
Error Messages	N/A	
Related Commands	N/A	

## Show Clock Information

### Commands

#### show clock

Syntax Description	<b>show</b>	Display configuration/status information
	<b>clock</b>	Display system clock information
Defaults	N/A	
Command Modes	User EXEC Privileged EXEC	
Usage Guidelines	N/A	
Examples	<pre> moxa# show clock Clock Source           : Local Time Zone              : UTC+00:00 Current Time           : Fri May 03 22:59:33 2019 Daylight Saving        : Disabled   Start Date           : Jan 01 2000 00:00   End Date              : Dec 31 2000 23:00   Offset                : 0 Minutes  Authentication Keys NTP Client Time Server   [1] time.nist.gov (No Auth) SNTP Client Time Server   [1] time.nist.gov NTP/SNTP Server        : Disabled   Authentication        : Disabled </pre>	
Error Messages	N/A	
Related Commands	N/A	

# Port

## Port Interface

### Port Setting

#### Show Interface Status

##### Commands

##### show interface status

Syntax Description	<b>show</b>	Show running system information				
	<b>interface</b>	Display interface information				
	<b>status</b>	The status of the interface				
Defaults	N/A					
Command Modes	Privileged EXEC					
Usage Guidelines	N/A					
Examples	moxa# show interface status					
	Port	Status	Duplex	Speed	Negotiation	MDI/MDIX
	----	-----	-----	-----	-----	-----
	Eth1/1	connected	Full	1 Gbps	Auto	MDIX(Auto)
	Eth1/2	connected	Full	1 Gbps	Auto	MDIX(Auto)
	Eth1/3	not connected	Half	-	Auto	-
	Eth1/4	not connected	Half	-	Auto	-
	Eth2/1	not present	-	-	-	-
	Eth2/2	not present	-	-	-	-
	Eth2/3	not present	-	-	-	-
	Eth2/4	not present	-	-	-	-
	Eth3/1	not connected	Half	-	Auto	-
	Eth3/2	not connected	Half	-	Auto	-
	Eth3/3	not connected	Half	-	Auto	-
Error Messages	N/A					
Related Commands	N/A					

## Show Interface Type and ID

### Commands

**show interfaces** [<interface-type> <interface-id> ]

**show interfaces** [{ [<interface-type> <interface-id>] [{ description | storm-control | flowcontrol | status } ] }

Syntax Description	<b>show</b>	Display configuration/statistics/general
	<b>interfaces</b>	Display interface information
	interface-type	The Ethernet type
	interface-id	The slot number/port number
	description	Description about the interface
	storm-control	Broadcast, multicast, and unicast storm control suppression levels for an interface
	flowcontrol	Receive or send flow control value for an interface
	status	The status of the interface
Defaults	N/A	
Command Modes	Privileged EXEC	
Usage Guidelines	N/A	
Examples	<pre>moxa# show interfaces ethernet 1/1  Eth1/1 up, line protocol is down (not connect) Bridge Port Type: Customer Bridge Port  Interface SubType: gigabitEthernet Interface Alias: Slot1/1 Media Type: 1000TX,RJ45,PTP  Hardware Address is 00:00:00:00:00:05 MTU 1522 bytes, Half duplex, 1 Gbps, Auto-Negotiation HOL Block Prevention enabled. CPU Controlled Learning disabled. Auto-MDIX invalid Input flow-control is off,output flow-control is off Port State: Discarding  Link Up/Down Trap is enabled  Reception Counters   Octets                : 0   Unicast Packets       : 0   Multicast Packets     : 0   Octets                : 0   Unicast Packets       : 0   Multicast Packets     : 0   Broadcast Packets     : 0   Discarded Packets     : 0   Error Packets         : 0   Unknown Protocol      : 0   CRC Errors            : 0   Symbol Errors         : 0   Good CRC Frame Size Errors: 0   Oversized w/ Bad CRC  : 0</pre>	

	Transmission Counters
	Octets : 0
	Unicast Packets : 0
	Multicast Packets : 0
	Broadcast Packets : 0
	Discarded Packets : 0
	Error Packets : 0
	Bad CRC : 0
	Error Drops : 0
	Timeout Drops : 0
	Error Packets : 0
Error Messages	N/A
Related Commands	N/A

## Show Interface Description

### Commands

#### show interface description

Syntax Description	<b>show</b>	Display configuration/statistics/general information
	<b>interface</b>	Display interface information
	<b>description</b>	Description about the interface
Defaults	N/A	
Command Modes	Privileged EXEC	
Usage Guidelines	N/A	
Examples	<pre>moxa# show interfaces description  Interface   AdminStatus   OperProtocol   Description ----- Eth1/1      up             down Eth1/2      up             down Eth1/3      up             down Eth1/4      up             down Eth2/1      up             down Eth2/2      up             down Eth2/3      up             down Eth2/4      up             down Eth3/1      up             down Eth3/2      up             down Eth3/3      up             down Eth3/4      up             down Eth4/1      up             down Eth4/2      up             down Eth4/3      up             down Eth4/4      up             down Eth5/1      up             down</pre>	
Error Messages	N/A	
Related Commands	N/A	

## Show Flow Control

### Commands

**show flow-control** [ interface [{ port-channel <port-channel-id> | ethernet <slot>/<port> } ] ]

Syntax Description	<b>show</b>	Display configuration/statistics/general information					
	<b>flow-control</b>	Display flow-control information					
	interface	Protocol-specific configuration of the interface					
	port-channel	The port channel interface					
	port-channel-id	The port channel ID					
	interface-type	The Ethernet interface					
	slot/port	The slot number or port number					
Defaults	N/A						
Command Modes	Privileged EXEC						
Usage Guidelines	N/A						
Examples	moxa# show flow-control						
	Port	Admin	Oper	Tx Pause	Rx Pause	HC TxPause	HC RxPause
	-----	-----	-----	-----	-----	-----	-----
	Eth1/1	off	off	0	0	0	0
	Eth1/2	off	off	0	0	0	0
	Eth1/3	off	off	0	0	0	0
	Eth1/4	off	off	0	0	0	0
	Eth2/1	off	off	0	0	0	0
	Eth2/2	off	off	0	0	0	0
	Eth2/3	off	off	0	0	0	0
	Eth2/4	off	off	0	0	0	0
	Eth3/1	off	off	0	0	0	0
	Eth3/2	off	off	0	0	0	0
	Eth3/3	off	off	0	0	0	0
	Eth3/4	off	off	0	0	0	0
	Eth4/1	off	off	0	0	0	0
	Eth4/2	off	off	0	0	0	0
	Eth4/3	off	off	0	0	0	0
	Eth4/4	off	off	0	0	0	0
	Eth5/1	off	off	0	0	0	0
Eth5/2	off	off	0	0	0	0	
Eth5/3	off	off	0	0	0	0	
Error Messages	N/A						
Related Commands	N/A						



## Show Linkup Delay Status

### Commands

**show linkup-delay**

**show linkup-delay** [ interface <iftype> <ifnum> ]

Syntax Description	<b>show</b>	Display configuration/statistics/general
	<b>linkup-delay</b>	Display linkup-delay information
	interface	Interface-related configuration
	iftype	The Ethernet type
	ifnum	The slot number or port number
Defaults	N/A	
Command Modes	Privileged EXEC	
Usage Guidelines	N/A	
Examples	<pre> moxa# show linkup-delay LinkUp Delay Table ----- Interface Id           : Eth1/1 Link Up Delay System Status      : DISABLED Link Up Delay Port Status        : DISABLED Link Up Delay Port Time         : 2 Seconds Link Up Delay Remaining Time    : 0 Seconds  LinkUp Delay Table ----- Interface Id           : Eth1/2 Link Up Delay System Status      : DISABLED Link Up Delay Port Status        : DISABLED Link Up Delay Port Time         : 2 Seconds Link Up Delay Remaining Time    : 0 Seconds </pre>	
Error Messages	N/A	
Related Commands	N/A	

## Configure Shutdown Settings

### Commands

**shutdown**

**no shutdown**

Syntax Description	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>shutdown</b>	Configure shutdown parameters
Defaults	Physical ports are enabled by default	
Command Modes	Interface Configuration	
Usage Guidelines	N/A	
Examples	moxa(config-if)# shutdown	
Error Messages	N/A	
Related Commands	N/A	

## Configure Description Settings

### Commands

**description** <description of this interface>

**no description**

Syntax Description	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>description</b>	Configure description parameters
	description of this interface	The description of the interface
Defaults	Empty string	
Command Modes	Interface Configuration	
Usage Guidelines	N/A	
Examples	moxa(config-if)# description moxa	
Error Messages	% Port Setting: Invalid: data.portTable[0].description must be shorter than or equal to 127 characters	
Related Commands	N/A	

## Configure Duplex Settings

### Commands

**duplex** { full | half }

Syntax Description	<b>duplex</b>	Configure duplex parameters
	full	Set the port to full-duplex mode
	half	Set the port to half-duplex mode
Defaults	The port is full-duplex without auto-negotiation by default	
Command Modes	Interface Configuration	
Usage Guidelines	N/A	
Examples	moxa(config-if)# no auto-negotiation moxa(config-if)# duplex full	
Error Messages	% Port Setting: Invalid: Fiber port can only be configured to full duplex/auto-mdix. % Port Setting: Invalid: Speed, Duplex and MDI/MDIX can only be configured when the port exists.	
Related Commands	speed { 10   100 }	

## Configure Speed Settings

### Commands

**speed** { 10 | 100 }

Syntax Description	<b>speed</b>	Configure port speed parameters
	10	Set the port to run at 10 Mbps
	100	Set the port to run at 100 Mbps
Defaults	The port is set to 100 Mbps by default if auto-negotiation is disabled on the port	
Command Modes	Interface Configuration	
Usage Guidelines	N/A	
Examples	moxa(config-if)# no auto-negotiation moxa(config-if)# speed 100	
Error Messages	% Port Setting: Invalid: Speed cannot configure a speed which is over the ability of the port. % Port Setting: Invalid: If a speed is equal to or faster than 10G, the port cannot configure autoNego/duplex/speed. % Port Setting: Invalid: Speed, Duplex and MDI/MDIX can only be configured when the port exists.	
Related Commands	duplex { full   half }	

## Enable/Disable Flow Control Setting

### Commands

**flowcontrol** { on | off }

Syntax Description	<b>flowcontrol</b>	Configure flow-control parameters
	on	Enable flow control
	off	Disable flow control
Defaults	Flow control is disabled by default	
Command Modes	Interface Configuration	
Usage Guidelines	N/A	
Examples	moxa(config-if)# flowcontrol off	
Error Messages	N/A	
Related Commands	N/A	

## Configure MDIX Setting

### Commands

**mdix** { auto | mdi | mdix }

Syntax Description	<b>mdix</b>	Configure MDI/MDIX parameters
	auto	Set the port as an auto-crossover port
	mdi	Set the port as an MDI port
	mdix	Set the port as an MDIX port
Defaults	Auto-crossover is enabled by default	
Command Modes	Interface Configuration	
Usage Guidelines	N/A	
Examples	moxa(config-if)# mdix auto	
Error Messages	% Port Setting: Invalid: Fiber port can only be configured to full duplex/auto-mdix. % Port Setting: Invalid: Speed, Duplex and MDI/MDIX can only be configured when the port exists.	
Related Commands	N/A	

## Linkup Delay

### Enable/Disable Linkup Delay

#### Commands

**linkup-delay** { enable | disable }

**no linkup-delay**

Syntax Description	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>linkup-delay</b>	Configure linkup-delay parameters
	enable	Enable linkup-delay in the system
	disable	Disable linkup-delay in the system
Defaults	System-wide linkup-delay is disabled by default	
Command Modes	Global Configuration	
Usage Guidelines	N/A	
Examples	moxa(config)# linkup-delay disable	
Error Messages	N/A	
Related Commands	linkup-delay linkup-delay timer <integer (1-1000)>	

## Configure Linkup Delay Timer

### Commands

**linkup-delay timer** <integer (1-1000)>

Syntax Description	<b>linkup-delay</b>	Configure linkup-delay parameters
	<b>timer</b>	Set the timer for linkup-delay
	integer (1-1000)	Timer value ranger from 1 to 1000 seconds
Defaults	The linkup delay timer is 2 seconds by default	
Command Modes	Interface Configuration	
Usage Guidelines	N/A	
Examples	moxa(config-if)# linkup-delay timer 2	
Error Messages	N/A	
Related Commands	linkup-delay [ enable   disable ] linkup-delay	

## Configure Auto-Negotiation Setting

### Commands

**auto-negotiation**

**no auto-negotiation**

Syntax Description	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>auto-negotiation</b>	Configure auto-negotiation parameters
Defaults	Auto-negotiation is enabled by default	
Command Modes	Interface Configuration	
Usage Guidelines	N/A	
Examples	moxa(config-if)# auto-negotiation	
Error Messages	N/A	
Related Commands	speed { 10   100 } duplex { full   half }	

## Link Aggregation

### Port Channel

#### Configure Interface Port Channel

##### Commands

**interface port-channel** <port-channel-id>

**no interface port-channel** [<port-channel-id>]

Syntax Description	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>interface</b>	Configure interface parameters
	<b>port-channel</b>	The port-channel interface
	port-channel-id	Configure port-channel ID parameters
Defaults	N/A	
Command Modes	Global Configuration Mode	
Usage Guidelines	N/A	
Examples	<pre>moxa# configure terminal moxa(config)# interface port-channel 10 moxa(config-if)# no shutdown moxa(config-if)# exit moxa(config)# no interface port-channel 10</pre>	
Error Messages	<pre>'Invalid: Link Aggregation/Port-Channel group is out of range.'</pre> <pre>'Invalid: Port channel should be activated before setting the selection policy configuration.'</pre> <pre>'Invalid: The port-channel does not exist.'</pre>	
Related Commands	show port-channel load-balance	

#### Configure Port Channel Shutdown Settings

##### Commands

**shutdown**

**no shutdown**

Syntax Description	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>shutdown</b>	Shut down the port-channel
Defaults	N/A	
Command Modes	port channel Interface Mode	
Usage Guidelines	N/A	
Examples	<pre>moxa# configure terminal moxa(config)# interface port-channel 10 moxa(config-if)# no shutdown moxa(config-if)# shutdown</pre>	
Error Messages	N/A	
Related Commands	show port-channel port	

## Configure Port Channel Load Balance

### Commands

**port-channel load-balance** { src-mac | dest-mac | src-dest-mac } [ <port-channel-id>]

**no port-channel load-balance** [<port-channel-id>]

Syntax Description	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>port-channel</b>	Configure port-channel parameters
	<b>load-balance</b>	Configure load balancing policy parameters
	src-mac	Load distribution is based on the source MAC address
	dest-mac	Load distribution is based on the destination MAC address
	src-dest-mac	Load distribution is based on the source and destination MAC address
	<port-channel-id>	Configure port-channel ID parameters
Defaults	Port-channel load balancing is set to source/destination MAC address (src-dest-mac) by default	
Command Modes	Global Configuration	
Usage Guidelines	N/A	
Examples	<pre>moxa# configure terminal moxa(config)# interface port-channel 10 moxa(config-if)# no shutdown moxa(config-if)# exit moxa(config-if)# port-channel load-balance src-mac 10 moxa(config-if)# no port-channel load-balance src-mac 10</pre>	
Error Messages	<p>'Invalid: Link Aggregation/Port-Channel group is out of range.'</p> <p>'Invalid: Port channel should be activated before setting the selection policy configuration.'</p> <p>'Invalid: The port-channel does not exist.'</p>	
Related Commands	show port-channel load-balance	

## Configure Channel Group Mode

### Commands

**channel-group** <port-channel-id> **mode** { on | active | passive }

**no channel-group**

Syntax Description	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>channel-group</b>	Configure port-channel parameters
	port-channel-id	Configure channel group number parameters
	<b>mode</b>	Configure mode for port-channel parameters
	on	Configure the interface to use static trunk channel without LACP
	active	Configure LACP negotiation to start unconditionally
	passive	Configure LACP negotiation to start only when a LACP packet is received from the peer
Defaults	N/A	
Command Modes	Interface Configuration Mode	
Usage Guidelines	N/A	
Examples	<pre>moxa# configure terminal moxa(config)# interface ethernet 1/1 moxa(config-if)# channel-group 10 mode on moxa(config-if)# channel-group 10 mode active moxa(config-if)# channel-group 10 mode passive moxa(config-if)# no channel-group</pre>	
Error Messages	<pre>'Invalid: Switch shall have at least 2 ports.'</pre> <pre>'Invalid: This port cannot join as it exceeds the maximum number of port channels.'</pre> <pre>'Invalid: Interface index duplication.'</pre> <pre>'Invalid: Link Aggregation/Port-Channel group is out of range.'</pre> <pre>'Invalid: When a port joins the port channel, the Interface Duplexity should be Full Duplex.'</pre> <pre>'Invalid: Port-channel cannot be created when flow control on the port is enabled.'</pre> <pre>'Invalid: This port-channel is used by Turbo Ring/Turbo Chain/Dual Homing, it could not be destroyed.'</pre> <pre>'Invalid: The port-channel does not exist.'</pre> <pre>'Invalid: In the same port-channel, the member port mode should be the same.'</pre> <pre>'Invalid: Port-channel cannot be created when ports are operating at different speeds.'</pre>	
Related Commands	<pre>show port-channel [&lt;channel-group-ID&gt;] {detail   load-balance   port   port-channel   summary   protocol }</pre> <pre>show interface [&lt;interface-type&gt; &lt;interface-id&gt; ] port-channel</pre>	

## Configure LACP Wait Time

### Commands

**lacp wait-time** < wait-time-value >

**no lacp wait-time**

Syntax Description	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>lacp</b>	Configure LACP parameters
	<b>wait-time</b>	Configure LACP wait-time parameters
	wait-time-value	Configure the LACP wait-time value
Defaults	The default wait time is 2 seconds	
Command Modes	Interface Configuration Mode	
Usage Guidelines	N/A	
Examples	<pre>moxa# configure terminal moxa(config)# interface ethernet 1/1 moxa(config-if)# lacp wait-time 5 moxa(config-if)#no lacp wait-time moxa(config-if)# end</pre>	
Error Messages	N/A	
Related Commands	N/A	

## Configure LACP Timeout Settings

### Commands

**lacp timeout** { long | short }

**no lacp timeout**

Syntax Description	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>lacp</b>	Configure LACP parameters
	<b>timeout</b>	Configure timeout parameters
	long	Configure the longest timeout of 90 seconds
	short	Configure the shortest timeout of 3 seconds
Defaults	LACP timeout is set to long be default	
Command Modes	Interface Configuration Mode	
Usage Guidelines	N/A	
Examples	<pre>moxa# configure terminal moxa(config)# interface ethernet 1/1 moxa(config-if)# lacp timeout short moxa(config-if)#no lacp timeout moxa(config-if)# end</pre>	
Error Messages	N/A	
Related Commands	N/A	



## Show Link Aggregation Information

### Commands

**show port-channel** [<port-channel-id>] [{ detail | load-balance | port | port-channel | summary | protocol }]

Syntax Description	<b>show</b>	Display configuration / status information
	<b>port-channel</b>	Display port-channel information
	port-channel-id	Display channel group information
	detail	Display detailed information
	load-balance	Display load-balance scheme among ports in the port-channel
	port	Display port-channel port information
	port-channel	Display port-channel information
	summary	Display summary per channel group
	protocol	Display protocol used in the port-channel
Defaults	N/A	
Command Modes	User EXEC Privileged EXEC	
Usage Guidelines	N/A	
Examples	moxa# show port-channel 10 detail moxa# show port-channel 10 load-balance moxa# show port-channel 10 port moxa# show port-channel 10 port-channel moxa# show port-channel 10 summary moxa# show port-channel	
Error Messages	'Invalid: The port-channel does not exist.'	
Related Commands	interface port-channel channel-group <channel-group-id> mode { on   active   passive}	

## Show Port Channel Interfaces

### Commands

**show interfaces** { [ { <interface-type> <interface-id > } ] port-channel }

Syntax Description	<b>show</b>	Display configuration / status information
	<b>interfaces</b>	Display interface specific information
	interface-type	Display interface type
	interface-id	Display interface id
	port-channel	Display port-channel information
Defaults	N/A	
Command Modes	User EXEC Privileged EXEC	
Usage Guidelines	N/A	
Examples	moxa# show interfaces ethernet 0/1 port-channel	
Error Messages	N/A	
Related Commands	channel-group <channel-group-id> mode { on   active   passive} show port-channel [<port-channel-id>] [{ detail   load-balance   port   port-channel   summary   protocol } ]	

## PoE

### PoE General Settings

#### Enable/Disable PoE Output Setting

##### Commands

**poe** { enable | disable }

Syntax Description	<b>poe</b>	Configure PoE parameters
	enable	Enable PoE on the switch
	disable	Disable PoE on the switch
Defaults	PoE is enabled by default	
Command Modes	Privileged EXEC Global Configuration	
Usage Guidelines	Enable global power output.	
Examples	moxa(config)# poe {enable   disable}	
Error Messages	N/A	
Related Commands	show poe [interface <iftyp> <ifnum>] {config   status   diagnosis}	

#### Configure Power Budget Setting

##### Commands

**poe system-power-budget** <watt: integer(30-720)>

Syntax Description	<b>poe</b>	Configure PoE parameters
	<b>system-power-budget</b>	The total power budget for all PDs connected to the switch
	watt: integer r(30-720)	Set the power budget depending on the external power supply's (EPS) output ability
Defaults	The default power budget is set to 720 watts	
Command Modes	Privileged EXEC Global Configuration	
Usage Guidelines	Data range: watt: 30-720	
Examples	moxa(config)# poe system-power-budget <watt: integer(30-720)>	
Error Messages	'Invalid: Sum of power allocation cannot exceed system power budget.'	
Related Commands	show poe [interface <iftyp> <ifnum>] {config   status   diagnosis}	

## Configure Auto Power Cutting Settings

### Commands

**poe auto-power-cutting**

**no poe auto-power-cutting**

Syntax Description	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>poe</b>	Configure PoE parameters
	<b>auto-power-cutting</b>	Cut power automatically when the PoE power consumption exceeds the system power budget
Defaults	PoE automatic power cutting is disabled by default	
Command Modes	Privileged EXEC Global Configuration	
Usage Guidelines	Enable auto-power-cutting to ensure the power supply for higher priority PDs	
Examples	moxa(config)# poe auto-power-cutting moxa(config)# no poe auto-power-cutting	
Error Messages	N/A	
Related Commands	show poe [interface <iftype> <ifnum>] {config   status   diagnosis} poe priority {critical   high   low}	

## PD Failure Check

### Configure Port PD Failure Check Setting

#### Commands

```
poe pd-failure-check [ { device-ip <ucast_addr> | check-frequency <seconds: integer(5-300)> | no-response-times <times: integer(1-10)> | action { no-action | restart-pd | shutdown-pd } } ]
no poe pd-failure-check
```

Syntax Description	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>po</b> e	Configure PoE parameters
	<b>pd-failure-check</b>	Check the PD fail status
	<b>device-ip</b>	Check the device IP
	ucast_addr	The device IP address
	<b>check-frequency</b>	Check device frequency
	seconds: integer (5-300)	The check frequency in seconds
	<b>no-response-times</b>	The limit for the amount of no response checks the switch performs
	times: integer (1-10)	The amount of checks
	<b>action</b>	Trigger an action if the no response times reaches the set limit
	<b>no-action</b>	Perform no action
	<b>restart-pd</b>	Restart the PD
	<b>shutdown-pd</b>	Shutdown the PD
Defaults	<b>device-ip:</b> 0.0.0.0 seconds: 10 times: 3 <b>action: no-action</b> Data range: seconds: 5-300 times: 1-10	
Command Modes	Privileged EXEC Interface Configuration	
Usage Guidelines	Set PoE PD Failure Check on ports. The switch pings <b>device-ip</b> every <b>check-frequency</b> second(s). The <b>Action</b> will be triggered if the no response times of ping reach <b>no-response-times</b> .	
Examples	moxa(config-if)# poe pd-failure-check [{device-ip <ucast_addr>   check-frequency <integer(5-300)>   no-response-times <integer(1-10)>   action {no-action   restart-pd   shutdown-pd}}] moxa(config-if)# no poe pd-failure-check	
Error Messages	'Invalid: Device IP is not a valid IP address.'	
Related Commands	show poe pd-failure-check	

## PoE Scheduling

### Configure Scheduling Rule Setting

#### Commands

**poe scheduling** <rule-name: string(63)> <start-date-year: integer(1970-2038)> <start-date-month: integer(1-12)> <start-date-day: integer(1-31)> <start-time-hour: integer(0-24)> <start-time-min: integer(0-59)> <end-time-hour: integer(0-24)> <end-time-min: integer(0-59)>

Syntax Description	<b>poe</b>	Configure PoE parameters
	<b>scheduling</b>	Schedule PoE availability with rules
	rule-name: string (63)	The scheduling rule name
	start-date-year: integer (1970-2038)	The scheduling rule starting year
	start-date-month: integer (1-12)	The scheduling rule starting month
	start-date-day: integer (1-31)	The scheduling rule starting day
	start-time-hour: integer (0-24)	The scheduling rule starting hour
	start-time-min: integer (0-59)	The scheduling rule starting minute
	end-time-hour: integer (0-24)	The scheduling rule ending hour
end-time-min: integer (0-59)	The scheduling rule ending minute	
Defaults	N/A	
Command Modes	Privileged EXEC Global Configuration	
Usage Guidelines	Add a scheduling rule or modify rule times of an existing rule. By default, a new rule is not activate and is non-repeating. Rules need to be applied to ports.	
Examples	moxa(config)# poe scheduling <rule-name: string(63)> <start-date-year: integer(1970-2038)> <start-date-month: integer(1-12)> <start-date-day: integer(1-31)> <start-time-hour: integer(0-24)> <start-time-min: integer(0-59)> <end-time-hour: integer(0-24)> <end-time-min: integer(0-59)>	
Error Messages	'Invalid: Schedule is not valid.' 'Invalid: Start Date is not valid.' 'Invalid: Start Time is not valid.' 'Invalid: End Time is not valid.' 'Invalid: The start time cannot exceed the end time.' 'Invalid: Schedule is conflict.'	
Related Commands	show poe scheduling [<rule-name: string(63)>] no poe scheduling <rule-name: string(63)> poe scheduling <rule-name: string(63)> activate no poe scheduling <rule-name: string(63)> activate poe scheduling <rule-name: string(63)> repeat {daily   weekday   weekend   sunday   monday   tuesday   wednesday   thursday   friday   saturday} no poe scheduling <rule-name: string(63)> repeat {daily   weekday   weekend   sunday   monday   tuesday   wednesday   thursday   friday   saturday} poe scheduling <rule-name: string(63)> no poe scheduling <rule-name: string(63)>	

## Apply Port Scheduling Rule

### Commands

**poe scheduling** <rule-name: string (63)>

**no poe scheduling** <rule-name: string (63)>

Syntax Description	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>poe</b>	Configure PoE parameters
	<b>scheduling</b>	Schedule PoE with rules
	rule-name: string(63)	The scheduling rule name as the index key
Defaults	Scheduling rules are not applied to ports by default	
Command Modes	Privileged EXEC Interface Configuration	
Usage Guidelines	Apply PoE scheduling rules to ports.	
Examples	moxa(config-if)# poe scheduling <rule-name: string (63)> moxa(config-if)# no poe scheduling <rule-name: string (63)>	
Error Messages	N/A	
Related Commands	show poe scheduling [ <rule-name: string (63)> ]	

## Remove PoE Schedule Setting

### Commands

**no poe scheduling** <rule-name: string (63)>

Syntax Description	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>poe</b>	Configure PoE parameters
	<b>scheduling</b>	Schedule PoE with rules
	rule-name: string (63)	The scheduling rule name as the index key
Defaults	N/A	
Command Modes	Privileged EXEC Global Configuration	
Usage Guidelines	Delete a scheduling rule.	
Examples	moxa(config)# no poe scheduling <rule-name: string(63)>	
Error Messages	N/A	
Related Commands	show poe scheduling [ <rule-name: string(63)> ] poe scheduling <rule-name: string(63)> <start-date-year: integer(1970-2038)> <start-date-month: integer(1-12)> <start-date-day: integer(1-31)> <start-time-hour: integer(0-24)> <start-time-min: integer(0-59)> <end-time-hour: integer(0-24)> <end-time-min: integer(0-59)>	

## Configure Scheduling Rule Setting

### Commands

**poe scheduling** <rule-name: string(63)> **activate**

**no poe scheduling** <rule-name: string(63)> **activate**

Syntax Description	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>poe</b>	Configure PoE parameters
	<b>scheduling</b>	Schedule PoE with rules
	rule-name: string (63)	The scheduling rule name as the index key
	<b>activate</b>	Activate the PoE scheduling rule
Defaults	The scheduling rule is not activated by default	
Command Modes	Privileged EXEC Global Configuration	
Usage Guidelines	Activate a rule to apply the rule.	
Examples	moxa(config)# poe scheduling <rule-name: string (63)> activate moxa(config)# no poe scheduling <rule-name: string (63)> activate	
Error Messages	N/A	
Related Commands	show poe scheduling [<rule-name: string(63)>] poe scheduling <rule-name: string(63)> <start-date-year: integer(1970-2038)> <start-date-month: integer(1-12)> <start-date-day: integer(1-31)> <start-time-hour: integer(0-24)> <start-time-min: integer(0-59)> <end-time-hour: integer(0-24)> <end-time-min: integer(0-59)>	

## Configure Scheduling Repeat Setting

### Commands

**po e scheduling** <rule-name: string(63)> **repeat** { daily | weekday | weekend | sunday | monday | tuesday | wednesday | thursday | friday | saturday }

**no po e scheduling** <rule-name: string(63)> **repeat** { daily | weekday | weekend | sunday | monday | tuesday | wednesday | thursday | friday | saturday }

Syntax Description	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>po e</b>	Configure PoE parameters
	<b>scheduling</b>	Schedule PoE with rules
	rule-name: string (63)	The scheduling rule name as the index key
	<b>repeat</b>	Repeat PoE scheduling rules
	daily	Repeat daily
	weekday	Repeat on weekdays
	weekend	Repeat on weekends
	sunday	Repeat every Sunday
	monday	Repeat every Monday
	tuesday	Repeat every Tuesday
	wednesday	Repeat every Wednesday
	thursday	Repeat every Thursday
	friday	Repeat every Friday
saturday	Repeat every Saturday	
Defaults	N/A	
Command Modes	Privileged EXEC Global Configuration	
Usage Guidelines	Set PoE scheduling rules to repeat on the specified day(s).	
Examples	moxa(config)# no po e scheduling <rule-name: string(63)> repeat {daily   weekday   weekend   sunday   monday   tuesday   wednesday   thursday   friday   saturday}	
Error Messages	N/A	
Related Commands	show po e scheduling [<rule-name: string(63)>] po e scheduling <rule-name: string(63)> <start-date-year: integer(1970-2038)> <start-date-month: integer(1-12)> <start-date-day: integer(1-31)> <start-time-hour: integer(0-24)> <start-time-min: integer(0-59)> <end-time-hour: integer(0-24)> <end-time-min: integer(0-59)>	

## Configure Port Power Output Setting

### Commands

**po e**

**no po e**

Syntax Description	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>po e</b>	Configure PoE parameters
Defaults	Port PoE power output is enabled by default	
Command Modes	Privileged EXEC Interface Configuration	
Usage Guidelines	N/A	
Examples	moxa(config-if)# po e moxa(config-if)# no po e	
Error Messages	N/A	
Related Commands	show po e [interface <iftype> <ifnum>] {config   status   diagnosis}	



## Configure Port Power Output Mode Setting

### Commands

**poe output-mode** { auto | high-power | force power-allocation <watt: integer(0-36)> }

Syntax Description	<b>poe</b>	Configure PoE parameters
	<b>output-mode</b>	The power output mode depending on the connected PD
	auto	Standard output mode
	high-power	Standard output mode with a higher power limit
	force	Non-standard or legacy output mode
	power-allocation	Power output limit for high-power mode and force mode
	watt: integer (0-36)	The port PoE power output limit
Defaults	The output mode is set to auto by default	
Command Modes	Privileged EXEC Interface Configuration	
Usage Guidelines	Auto mode is suitable for standard 802.3af/at PDs. The power allocation value should be set to 0. High-power mode is suitable for standard 802.3af/at PDs that require more than 30 watts of power. The power allocation value should be set to 36. Force mode is suitable for non-standard PDs.	
Examples	moxa(config-if)# poe output-mode {auto   high-power   force power-allocation <watt: integer(0-36)>}	
Error Messages	'Invalid: In PoE Output Auto Mode, the Power Allocation value is not valid.' 'Invalid: Sum of power allocation cannot exceed system power budget.' 'Invalid: In PoE Output High-Power Mode, the Power Allocation value is not valid.'	
Related Commands	show poe [interface <iftype> <ifnum>] {config   status   diagnosis}	

## Reset PoE Output Mode

### Commands

**no poe output-mode**

Syntax Description	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>poe</b>	Configure PoE parameters
	<b>output-mode</b>	The power output mode depending on the connected PD
Defaults	The output-mode is set to auto by default	
Command Modes	Privileged EXEC Global Configuration	
Usage Guidelines	N/A	
Examples	moxa(config-if)# no poe output-mode	
Error Messages	'Invalid: In PoE Output Auto Mode, the Power Allocation value is not valid.'	
Related Commands	show poe [interface <iftype> <ifnum>] {config   status   diagnosis}	

## Configure Port Legacy PD Detection Settings

### Commands

**poe legacy-pd-detection**

**no poe legacy-pd-detection**

Syntax Description	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>poe</b>	Configure PoE parameters
	<b>legacy-pd-detection</b>	Use legacy PD detection to power PDs if the capacitance of the PD is higher than 2.7 $\mu$ F or less than 10 $\mu$ F
Defaults	Legacy PD detection is disabled by default.	
Command Modes	Privileged EXEC Interface Configuration	
Usage Guidelines	Enable legacy PD detection on ports to power PDs within the 2.7 to 10 $\mu$ F capacitance range	
Examples	moxa(config-if)# poe legacy-pd-detection moxa(config-if)# no poe legacy-pd-detection	
Error Messages	N/A	
Related Commands	show poe [interface <iftyp> <ifnum>] {config   status   diagnosis}	

## Configure Port Auto Power Cutting Priority Setting

### Commands

**poe priority** { critical | high | low }

**no poe priority**

Syntax Description	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>poe</b>	Configure PoE parameters
	<b>priority</b>	The priority for automatically PoE cutting power
	critical	Critical priority
	high	High priority
	low	Low priority
Defaults	The priority is set to low by default	
Command Modes	Privileged EXEC Interface Configuration	
Usage Guidelines	Set the port priority for automatically cutting PoE power. Lower priority devices will be cut off first.	
Examples	moxa(config-if)# poe priority { critical   high   low } moxa(config-if)# no poe priority	
Error Messages	N/A	
Related Commands	show poe [interface <iftyp> <ifnum>] {config   status   diagnosis} poe auto-power-cutting no poe auto-power-cutting	

## PoE Status

### Show System and Port Setting, Status, and Diagnosis

#### Commands

**show poe** [ interface <iftype> <ifnum> ] { config | status | diagnosis }

Syntax Description	<b>show</b>	Display configuration/status information
	<b>poe</b>	Display PoE information
	interface	Interface information
	iftype	The interface type
	ifnum	The interface number
	config	The current PoE configuration applied to the port
	status	The PoE status
	diagnosis	PoE diagnosis
Defaults	N/A	
Command Modes	User EXEC Privileged EXEC	
Usage Guidelines	N/A	
Examples	moxa# show poe [interface <iftype> <ifnum>] {config   status   diagnosis}	
Error Messages	N/A	
Related Commands	<p>poe {enable   disable}</p> <p>poe system-power-budget &lt;watt: integer(30-720)&gt;</p> <p>poe auto-power-cutting</p> <p>no poe auto-power-cutting</p> <p>poe</p> <p>no poe</p> <p>poe output-mode { auto   high-power   force power-allocation &lt;watt: integer(0-36)&gt; }</p> <p>poe legacy-pd-detection</p> <p>no poe legacy-pd-detection</p> <p>poe priority { critical   high   low }</p> <p>no poe priority</p>	

### Show Port PD Failure Check Setting and Status

#### Commands

**show poe pd-failure-check** [ interface <iftype> <ifnum> ] { config | status }

Syntax Description	<b>show</b>	Display configuration/status information
	<b>poe</b>	Display PoE information
	<b>pd-failure-check</b>	Check the PD failure status
	interface	Interface information
	iftype	The interface type
	ifnum	The interface number
	config	The current PoE configuration applied to the port
	status	PoE status
Defaults	N/A	
Command Modes	User EXEC Privileged EXEC	
Usage Guidelines	N/A	
Examples	moxa# show poe pd-failure-check [interface <iftype> <ifnum>] {config   status}	
Error Messages	N/A	
Related Commands	<p>poe pd-failure-check [ { device-ip &lt;ucast_addr&gt;   check-frequency &lt;seconds: integer(5-300)&gt;   no-response-times &lt;times: integer(1-10)&gt;   action { no-action   restart-pd   shutdown-pd } } ]</p> <p>no poe pd-failure-check</p>	

## Show Scheduling Rule Setting

### Commands

**show poe scheduling** [ <rule-name: string(63)> ]

Syntax Description	<b>show</b>	Display configuration/status information
	<b>poe</b>	Display PoE information
	<b>scheduling</b>	Schedule PoE availability with rules
	rule-name:string (63)	The scheduling rule name
Defaults	N/A	
Command Modes	User EXEC Privileged EXEC	
Usage Guidelines	N/A	
Examples	moxa# show poe scheduling [<rule-name: string(63)>]	
Error Messages	N/A	
Related Commands	<p>poe scheduling &lt;rule-name: string(63)&gt; &lt;start-date-year: integer(1970-2038)&gt; &lt;start-date-month: integer(1-12)&gt; &lt;start-date-day: integer(1-31)&gt; &lt;start-time-hour: integer(0-24)&gt; &lt;start-time-min: integer(0-59)&gt; &lt;end-time-hour: integer(0-24)&gt; &lt;end-time-min: integer(0-59)&gt;</p> <p>poe scheduling &lt;rule-name: string(63)&gt; activate</p> <p>no poe scheduling &lt;rule-name: string(63)&gt; activate</p> <p>poe scheduling &lt;rule-name: string(63)&gt; repeat { daily   weekday   weekend   sunday   monday   tuesday   wednesday   thursday   friday   saturday }</p> <p>no poe scheduling &lt;rule-name: string(63)&gt; repeat { daily   weekday   weekend   sunday   monday   tuesday   wednesday   thursday   friday   saturday }</p> <p>poe scheduling &lt;rule-name: string(63)&gt;</p> <p>no poe scheduling &lt;rule-name: string(63)&gt;</p>	

# Layer 2 Switching

## VLAN

### IEEE 802.1Q

#### Show VLAN Device Information

##### Commands

##### show vlan device info

Syntax Description	<b>vlan</b>	Display VLAN bridge status and information
	<b>device</b>	The VLAN device
	<b>info</b>	Information
Defaults	N/A	
Command Modes	Privileged EXEC/ User EXEC	
Usage Guidelines	N/A	
Examples	<pre>moxa# show vlan device info  vlan device configurations ----- vlan Status                : Enabled vlan Oper status           : Enabled gvrp status                 : Enabled gmrp status                 : Enabled gvrp Oper status           : Enabled gmrp Oper status           : Enabled Bridge Mode                 : Customer Bridge Base-Bridge Mode           : Vlan Aware Bridge blan Operational Learning Mode : IVL Hybrid Default Learning Mode : IVL Version number              : 1 Max Vlan id                 : 4094 Max supported vlans         : 256</pre>	
Error Messages	N/A	
Related Commands	gvrp gmrp bridge-mode	

## Show VLAN Interface Status

### Commands

**show vlan** [{brief | id <vlan-range> | summary | ascending}]

Syntax Description	<b>show</b>	Display configuration/statistics/general information
	<b>Vlan</b>	Display the VLAN interface status
	brief	Display the VLAN entry related information of all active VLANs and VLANs (that are not active) for which the port details are configured.
	id	The VLAN index
	vlan-range	The VLAN index range (ex: 1-10 means the VID 1 to VID 10)
	summary	Display the total number of VLANs
	ascending	Display information for all VLANs in ascending order
Defaults	N/A	
Command Modes	Privileged EXEC/ User EXEC	
Usage Guidelines	N/A	
Examples	<pre> moxa# show vlan brief  vlan database ----- vlan ID          : 1 Member Ports    : Eth1/1, Eth1/2, Eth1/3, Eth1/4, Eth2/1, Eth2/2                   Eth2/3, Eth2/4, Eth3/1, Eth3/2, Eth3/3, Eth3/4                   Eth4/1, Eth4/2, Eth4/3, Eth4/4, Eth5/1, Eth5/2                   Eth5/3, Eth5/4, Eth6/1, Eth6/2, Eth6/3, Eth6/4                   Eth7/1, Eth7/2, Eth7/3, Eth7/4 Untagged Ports  : Eth1/1, Eth1/2, Eth1/3, Eth1/4, Eth2/1, Eth2/2                   Eth2/3, Eth2/4, Eth3/1, Eth3/2, Eth3/3, Eth3/4                   Eth4/1, Eth4/2, Eth4/3, Eth4/4, Eth5/1, Eth5/2                   Eth5/3, Eth5/4, Eth6/1, Eth6/2, Eth6/3, Eth6/4                   Eth7/1, Eth7/2, Eth7/3, Eth7/4 Forbidden Ports  : None Name            : Status          : Permanent Egress Ethertype : 0x8100 ----- </pre>	
Error Messages	N/A	
Related Commands	<pre> vlan &lt;vlan-id&gt; ports add &lt;interface-type&gt; &lt;1/a-b&gt; untagged &lt;interface-type&gt; &lt;1/a-b&gt; forbidden &lt;interface-type&gt; &lt;1/a-b&gt; vlan active vlan name </pre>	

## Show VLAN Port Configuration

### Commands

**show vlan port config port** [port {port-channel <integer> | < interface-type > < interface-id> }]

Syntax Description	<b>show</b>	Display configuration/statistics/general information
	<b>vlan</b>	Display VLAN interface status
	<b>port</b>	The port interface
	<b>config</b>	The port's configuration
	<b>port</b>	The port interface
	port-channel <integer>	The port channel ID This number is the max number of trunk group IDs
	interface-type	The Ethernet type
	interface-id integer	The interface ID: slot number/port number
Defaults	N/A	
Command Modes	Privileged EXEC/ User EXEC	
Usage Guidelines	N/A	
Examples	<pre> moxa# show vlan port config port ethernet 1/3  Vlan Port configuration table ----- Port Eth1/3 Bridge Port Type           : Customer Bridge Port Port Vlan ID                : 1 Port Acceptable Frame Type  : Admit All Port Ingress Filtering      : Disabled Port Mode                   : Hybrid Port Gvrp Status            : Enabled Port Gmrp Status            : Enabled Port Gvrp Failed Registrations : 0 Gvrp last pdu origin        : 00:00:00:00:00:00 Port Restricted Vlan Registration : Disabled Port Restricted Group Registration : Disabled Default Priority             : 0 Filtering Criteria          : Default Ingress EtherType           : 0x8100 Egress EtherType            : 0x8100 </pre>	
Error Messages	N/A	
Related Commands	Switchport pvid Switchport acceptable-frame-type Switchport ingress-filter Switchport mode gvrp gmrp vlan restricted group restricted switchport filtering-utility-criteria	

## Show MAC Address Table Information

### Commands

**show mac-address-table** [vlan <vlan-range>] [address <aa:aa:aa:aa:aa:aa>] [interface <interface-type> <interface-id> ]

**show mac-address-table aging-time**

**show mac-address-table count** [vlan <vlan-id>]

**show mac-address-table dynamic multicast** [vlan <vlan-range>] [address <aa:aa:aa:aa:aa:aa>] [interface {port-channel <integer> | <interface-type> <interface-id> }]

**show mac-address-table dynamic unicast** [vlan <vlan-range>] [address <aa:aa:aa:aa:aa:aa>] [interface {port-channel <integer> | <interface-type> <interface-id> }]

**show mac-address-table static multicast** [vlan <vlan-range>] [address <aa:aa:aa:aa:aa:aa>] [interface {port-channel <integer> | <interface-type> <interface-id> }]

**show mac-address-table static unicast** [vlan <vlan-range>] [address <aa:aa:aa:aa:aa:aa>] [interface {port-channel <integer> | <interface-type> <interface-id> }]

Syntax Description	<b>show</b>	Display configuration/statistics/general information
	<b>mac-address-table</b>	Display MAC address information
	<b>address</b>	MAC address entry
	<b>aging-time</b>	Maximum age of a Mac address table entry
	<b>count</b>	Number of MAC addresses present on all the VLANs or on a specified VLAN
	<b>dynamic</b>	Dynamic learned MAC address
	<b>static</b>	Static configured MAC address
	<b>multicast</b>	Multicast MAC address
	<b>unicast</b>	Unicast MAC address
	vlan	The VLAN interface
	vlan-range	The VLAN ID range for which the details will be displayed. This value ranges from 1 to 4094. For example, 4000-4010 will show information for those VLAN IDs.
	interface-type port-channel	The Ethernet type
	interface-id integer	The interface ID: slot number/port number
Defaults	N/A	
Command Modes	Privileged EXEC/ User EXEC	
Usage Guidelines	N/A	
Examples	<pre>moxa# show mac-address-table  vlan   Mac Address           Type      ConnectionId    Ports ----   - 1      00:00:5e:00:01:02    Learnt 1      00:21:cc:62:f7:0b    Learnt 1      00:21:cc:72:a8:d7    Learnt                                 Eth1/3                                 Eth1/3                                 Eth1/3  Total Mac Addresses displayed: 3</pre>	
Error Messages	N/A	
Related Commands	mac-address-table	



## Show MAC Address Table for Dynamic Multicast and Unicast

### Commands

**show mac-address-table dynamic multicast** [vlan <vlan-range>] [address <aa:aa:aa:aa:aa:aa>]  
[interface {port-channel <integer> | <interface-type> <interface-id> }]

**show mac-address-table dynamic unicast** [vlan <vlan-range>] [address <aa:aa:aa:aa:aa:aa>]  
[interface {port-channel <integer> | <interface-type> <interface-id> }]

Syntax Description	<b>show</b>	Display configuration/statistics/general information
	<b>mac-address-table</b>	Display MAC address information
	<b>dynamic</b>	Display dynamically learned MAC addresses
	<b>multicast</b>	The multicast MAC addresses
	<b>unicast</b>	The unicast MAC addresses
	vlan	The VLAN interface
	vlan-range	The VLAN ID range for which the details will be displayed. This value ranges from 1 to 4094. For example, 4000-4010 will show information for those VLAN IDs.
	interface-type port-channel	The Ethernet type The port-channel
	interface-id	The slot number/port number
Defaults	N/A	
Command Modes	Privileged EXEC/User EXEC	
Usage Guidelines	N/A	
Examples	<pre> moxa# show mac-address-table dynamic unicast  vlan   Mac Address           Type   ConnectionId   Ports ----   - 1      00:00:5e:00:01:02   Learnt 1      00:05:1b:a1:ae:62   Learnt 1      00:0c:29:9b:83:e9   Learnt .... Total Mac Addresses displayed: 44  iss# show mac-address-table dynamic multicast  vlan   Mac Address           Type   ConnectionId   Ports ----   - Total Mac Addresses displayed: 0 </pre>	
Error Messages	N/A	
Related Commands	mac-address-table	

## Show MAC Address Table for Static Multicast and Unicast

### Commands

**show mac-address-table static multicast** [vlan <vlan-range>] [address <aa:aa:aa:aa:aa:aa>] [interface {port-channel <integer> | <interface-type> <interface-id> }]

**show mac-address-table static unicast** [vlan <vlan-range>] [address <aa:aa:aa:aa:aa:aa>] [interface {port-channel <integer> | <interface-type> <interface-id> }]

Syntax Description	<b>show</b>	Display configuration/statistics/general information
	<b>mac-address-table</b>	Display MAC address information
	<b>static</b>	Static entry
	<b>multicast</b>	The multicast MAC address
	<b>unicast</b>	The unicast MAC address
	vlan	The VLAN interface
	vlan-range	The VLAN ID range for which the details will be displayed. This value ranges from 1 to 4094. For example, 4000-4010 will show information for those VLAN IDs.
	interface-type port-channel	The Ethernet type The port-channel
	interface-id	The slot number/port number
Defaults	N/A	
Command Modes	Privileged EXEC/ User EXEC	
Usage Guidelines	N/A	
Examples	<pre> moxa# show mac-address-table static multicast vlan 1  Static Multicast Table ----- Vlan          : 1 Mac Address   : 01:00:00:00:11:22 Receive Port  : Eth1/3 Member Ports  : Eth1/1 Forbidden Ports : Status       : Permanent -----  Vlan          : 1 Mac Address   : 01:00:00:11:22:33 Receive Port  : Member Ports  : Eth1/1, Eth1/2, Eth1/3, Eth1/4, Eth1/5, Eth1/6                Eth1/7, Eth1/8, Eth1/9, Eth1/10, Eth1/11, Eth1/12 Forbidden Ports : Status       : Permanent -----  Total Mac Addresses displayed: 2  iss# show mac-address-table static unicast  vlan  Mac Address      RecvPort Status      ConnectionId      Ports ----- 1     00:12:23:34:45:56      Permanent 1     00:31:13:31:13:13      DeleteOnReset 1     00:44:33:44:33:44      Permanent -----  Total Mac Addresses displayed: 3 </pre>	

Error Messages	N/A
Related Commands	mac-address-table

## Show GVRP Statistics

### Commands

**show gvrp statistics** [{port {port-channel <integer> | <interface-type> <interface-id>}]

Syntax Description	<b>show</b>	Display configuration/statistics/general information
	<b>gvrp statistics</b>	Display GVRP statistics
	interface-type	The Ethernet type
	port-channel	The port-channel
	interface-id	The slot number/port number
Defaults	N/A	
Command Modes	Privileged EXEC/ User EXEC	
Usage Guidelines	N/A	
Examples	<pre> moxa# show gvrp statistics port ethernet 1/3  GVRP Statistics for Port Eth1/3 ----- Total valid GVRP Packets Received:  18 Join Emptys           0 Join In                1 Leave In               0 Leave All              17 Leave Empty            0 Empty                 0 Total valid GVRP Packets Transmitted: 324 Join Emptys           0 Join In               324 Leave In               0 Leave All              0 Leave Empty            0 Empty                 0  moxa# show gmrp statistics port ethernet 1/3  GMRP Statistics for Port Eth1/3 ----- Total valid GMRP Packets Received 0: Join Emptys           0 Join In               0 Leave In               0 Leave All              0 Leave Empty            0 Empty                 0 Total valid GMRP Packets Transmitted:358 Join Emptys           0 Join In               358 Leave In               0 Leave All              0 Leave Empty            0 Empty                 0 </pre>	

Error Messages	N/A
Related Commands	vlan active

## Show VLAN Management

### Commands

#### show management vlan

Syntax Description	<b>show</b>	Display configuration/statistics/general information
	<b>management</b>	Display Management VLAN information
	<b>vlan</b>	The VLAN interface
Defaults	N/A	
Command Modes	Privileged EXEC/ User EXEC	
Usage Guidelines	N/A	
Examples	<pre>moxa# show management vlan  Management VLAN-List 1,2, .....</pre>	
Error Messages	N/A	
Related Commands	Management vlan No management vlan	

## Create/Delete a VLAN

### Commands

**vlan** <vlan-id>

**no vlan** <vlan-id>

**vlan active**

**vlan name** < vlan name string >

SyntaxDescription	<b>vlan/no vlan</b>	Create/delete a VLAN
	vlan-id	The VLAN identifier
	<b>active</b>	Activate the VLAN
	name < vlan name string >	The VLAN name string consisting of a total of 32 characters
Defaults	N/A	
Command Modes	Configuration	
Usage Guidelines	N/A	
Examples	<pre>moxa(config)# vlan 100 moxa(config-vlan)# vlan active moxa(config)# no vlan 100 moxa(config)#</pre>	
Error Messages	N/A	
Related Commands	interface vlan <vlan-id> show vlan	

## Configure VLAN Mode

### Commands

**ports add** {member ([<iftype> <iface\_list>][port-channel <integer>]) | untagged ([<iftype> <iface\_list>][port-channel <integer>]) | forbidden ([<iftype> <iface\_list>][port-channel <integer>])}

**vlan ports set member** ([<iftype> <iface\_list>][port-channel <integer>]) [untagged ([<iftype> <iface\_list>][port-channel <integer>])] [forbidden ([<iftype> <iface\_list>][port-channel <integer>])]

**vlan ports add** {member | untagged | forbidden} [<interface-type> <slot/port-port,slot/port,...>]  
 [port-channel <integer>]  
**no ports** [<interface-type> <slot/port-port,slot/port,...>] [port-channel <integer>] [untagged  
 ([<interface-type> <slot/port-port,slot/port,...>] [port-channel <integer>])] [forbidden ([<interface-type>  
 <slot/port-port,slot/port,...>] [port-channel <integer>])]

Syntax Description	<b>Ports/no ports</b>	Set/delete member/untagged/forbidden port
	<b>add</b>	Add member/untag/forbidden port
	<b>set</b>	Overwrite member/untagged/forbidden port
	<b>slot/port-port</b>	The slot number/port number
	interface-type	The Ethernet type
	port-channel	<1-N> Set the list of port channel interfaces or a specific port channel identifier.
	member	Configure the ports to be set as a member of the VLAN
	untagged	Configure the ports that will be used by the VLAN to transmit egress traffic as untagged packets.
	forbidden	Configures the ports to never receive packets from the VLAN
Defaults	N/A	
Command Modes	Config VLAN mode	
Usage Guidelines	This command can only be executed from within VLAN configuration mode. From Configuration mode, enter <b>vlan</b> <vlan-id> to enter VLAN config mode.	
Examples	<pre>moxa(config)# vlan 10 moxa(config-vlan)#ports add member ethernet 1/3 untagged all moxa(config-vlan)#ports add member ethernet 1/3 untagged ethernet 1/3 forbidden ethernet 1/2</pre>	
Error Messages	N/A	
Related Commands	<pre>vlan active switchport mode show vlan show mac-address-table count</pre>	

## Configure a Static Unicast MAC Address in the Forwarding Database

### Commands

**mac-address-table static unicast** <aa:aa:aa:aa:aa:aa> vlan <vlan-id> set [interface ([<interface-type> <slot/port-port,slot/port,...>] [<interface-type> <slot/port-port,slot/port,...>] [port-channel <a,b,c-d>] )] [status { permanent }]

**no mac-address-table static unicast** <aa:aa:aa:aa:aa:aa> vlan <vlan-id>

Syntax Description	<b>mac-address-table</b>	Configure mac-address-table parameters
	<b>static</b>	The statically configured MAC address
	<b>unicast</b>	Configure the unicast MAC address
	aa:aa:aa:aa:aa:aa	The unicast MAC address
	vlan	Configure the VLAN
	vlan-id	The VLAN id
	set	Set the unicast MAC address to a specified port
	interface-type	The Ethernet type The port-channel
	interface-id	The slot number/port number
	status	Set the status of the static unicast entry
	permanent	The entry remains even after the next reset of the bridge
Defaults	N/A	
Command Modes	Configuration	
Usage Guidelines	N/A	
Examples	moxa(config)#mac-address-table static unicast 00:11:22:33:22:11 vlan 1 set ethernet 1/2 status permanent	
Error Messages	N/A	
Related Commands	mac-address-table static multicast vlan vlan ports add show mac-address-table static unicast	

## Globally Enable/Disable GVRP on All Ports

### Commands

**gvrp** {enable | disable}

Syntax Description	<b>gvrp</b>	Configure GVRP parameters
	enable	Enable on all ports and start the GVRP on the switch
	disable	Disable GVRP on all ports.
Defaults	GVRP is disabled by default	
Command Modes	Configuration	
Usage Guidelines	N/A	
Examples	moxa(config)# gvrp enable	
Error Messages	N/A	
Related Commands	bridge-mode show vlan device info show gvrp statistics	

## Enable/Disable GVRP on Specific Ports

### Commands

**gvrp**

**no gvrp**

Syntax Description	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>gvrp</b>	Configure GVRP parameters GVRP: Enable GVRP on the specific port(s) No GVRP: Disable GVRP on the specific port(s)
Defaults	GVRP is disabled by default	
Command Modes	Configuration	
Usage Guidelines	N/A	
Examples	moxa# interface Ethernet 1/1 moxa(config-if)# gvrp	
Error Messages	N/A	
Related Commands	show vlan port config show gvrp statistics	

## Configure MAC Address Table Aging Time

### Commands

**mac-address-table aging-time** <10-300 seconds>

**no mac-address-table aging-time**

Syntax Description	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>mac-address-table</b>	Configure the MAC-address-table
	<b>aging-time</b>	Maximum age of an entry in the MAC address table to its default value.
	second	The aging time ranging from 10 to 300 seconds
Defaults	300s	
Command Modes	Configuration	
Usage Guidelines	N/A	
Examples	moxa(config)# mac-address-table aging-time 100	
Error Messages	N/A	
Related Commands	show mac-address-table aging-time	

## Configure PVID on a Specified Port

### Commands

**switchport pvid** <vlan-id>

**no switchport pvid**

Syntax Description	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>pvid</b>	Configure port-based VLAN parameters
	<b>vlan-id</b>	The VLAN ID, ranging from 1 to 4094.
Defaults	1	
Command Modes	Configuration	
Usage Guidelines	<p>If a PVID does not exist for this system, it will be created automatically after configuration.</p> <p>If the port is configured to be in Access Mode, the actions below will be applied automatically.</p> <ol style="list-style-type: none"> <li>1. Remove this port from member port list if it is bound to another VID which is different from PVID</li> <li>2. Modify this port into an untagged member of this PVID</li> </ol> <p>If the port is configured to be in Trunk Mode, the port will automatically be modified into a tagged member of this PVID.</p>	
Examples	moxa(config-if)# switchport pvid 1	
Error Messages	N/A	
Related Commands	switchport vlan vlan active switchport acceptable-frame-type	

## Configure VLAN-dependent BPDU Frames

### Commands

**switchport acceptable-frame-type** {all | tagged | untaggedAndPrioritytagged }

Syntax Description	<b>acceptable-frame-type</b>	Configure acceptable-frame-type parameters
	all	Configures the acceptable frame type as all which are acceptable and subjected to ingress filtering.
	tagged	Configures the acceptable frame type as tagged.
	untaggedAndPrioritytagged	Configures the acceptable frame type as untagged and priority tagged.
Defaults	all	
Command Modes	Configuration	
Usage Guidelines	N/A	
Examples	moxa(config-if)# switchport acceptable-frame-type untaggedAndPrioritytagged	
Error Messages	N/A	
Related Commands	switchport switchport pvid switchport ingress-filter switchport mode show vlan port config	



## Enable/Disable Ingress Filter

### Commands

**switchport ingress-filter**

**no switchport ingress-filtering**

Syntax Description	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>switchport</b>	The switch port
	<b>ingress-filtering</b>	Enable ingress-filtering
Defaults	disable	
Command Modes	Configuration	
Usage Guidelines	N/A	
Examples	moxa (config-if)# switchport ingress-filter moxa (config-if)# no switchport ingress-filter	
Error Messages	N/A	
Related Commands	switchport switchport acceptable-frame-type show vlan port config	

## Configure Switch Port Operation Mode

### Commands

**switchport mode** {access | trunk | hybrid}

Syntax Description	<b>switchport</b>	Configure the switch port
	<b>mode</b>	Configure switch port mode parameters
	access	Configure the port as an access port that accepts and sends only untagged packets. This kind of port is added as a member to a specific VLAN and only carries traffic for the VLAN to which the port is assigned. The port can only be set as an access port if the following 4 conditions are met: <ol style="list-style-type: none"> <li>1. GVRP is disabled for that port.</li> <li>2. The acceptable frame type is set as "Admit untagged and pri-tagged".</li> <li>3. The port is not a tagged member of any VLAN.</li> <li>4. The PVID is the same as the only untagged VLAN it joined.</li> </ol>
	trunk	Configures the port as trunk port that accepts and sends only tagged frames. This kind of port is added as members of several existing VLANs, and carries traffic for all of them. The port can only be set as a trunk port. if the following 2 conditions are met: <ol style="list-style-type: none"> <li>1. The acceptable frame type is set as "Admit tagged only"</li> <li>2. The port is not an untagged member of any VLAN.</li> </ol>
	hybrid	Configures the port as a hybrid port that accepts and sends both tagged and untagged frames
Defaults	The default port operation mode is set to Hybrid	
Command Modes	Configuration	
Usage Guidelines	<p>When changing from trunk or hybrid to access mode, the following changes will be automatically applied:</p> <ul style="list-style-type: none"> <li>Forces the port to become an untagged member of the PVID domain</li> <li>If the port exists in another VLAN, it will be removed</li> <li>Forces the accept frame type to be set to "Admit untagged and pri-tagged"</li> </ul> <p>When changing from access or hybrid to trunk mode, the following changes will be automatically applied:</p>	

	<p>Forces the port to become a tagged member of the PVID domain</p> <p>If the port was an untagged member in another VLAN, it will be changed into a tagged member.</p> <p>Forces the acceptable frame type to be set to "Admit tagged only"</p> <p>When changing from access or trunk to hybrid mode, there will be no changes</p>
Examples	moxa (config-if)# switchport mode hybrid
Error Messages	N/A
Related Commands	<p>switchport</p> <p>port gvrp</p> <p>vlan ports</p> <p>switchport acceptable-frame-type</p> <p>show vlan port config</p>

## Configure Restricted VLAN Registration

### Commands

#### vlan restricted

Syntax Description	<b>vlan restricted</b>	<p>Configure restricted VLAN parameters</p> <p>Enable or disable the restricted VLAN registration feature on the port. Enabled means the creation or modification of a dynamic VLAN entry is permitted only for VLANs for which static VLAN registration entries exist. Disabled means the creation or modification of a dynamic VLAN entry is permitted for all VLANs.</p>
Defaults	Restricted VLAN registration is disabled by default	
Command Modes	Privileged EXEC/ User EXEC	
Usage Guidelines	N/A	
Examples	moxa(config-if)# vlan restricted	
Error Messages	N/A	
Related Commands	show vlan port config	

## Create Filtering Utility Criteria

### Commands

#### switchport filtering-utility-criteria {default | enhanced}

Syntax Description	<b>filtering-utility-criteria</b>	Configure VLAN filtering utility criteria
	default	Only allow the learning of a source MAC from a packet received on the port if there is at least one member port for a VLAN mentioned in the packet.
	enhanced	<p>Only allow the learning of source MAC from a packet received on the port if the following conditions are met:</p> <p>At least one VLAN that uses the FID indicates the reception port and at least one other port with a port state of learning or forwarding in its member set</p> <p>Ingress to the VLAN is permitted through a port other than the source and reception ports. This port can be or not be a member of the VLAN.</p>
Defaults	By default, the VLAN filtering utility criteria is set to default	
Command Modes	Privileged EXEC/ User EXEC	
Usage Guidelines	N/A	
Examples	moxa(config-if)# switchport filtering-utility-criteria default	
Error Messages	N/A	
Related Commands	show vlan port config	

## Set VLAN Access Port

### Commands

**switchport access** vlan <vlan-id>

Syntax Description	<b>switchport access</b>	Configure the port as an access port
	vlan <vlan-id>	The specified VLAN ID for which this access port will carry traffic, ranging from 1 to 4094.
Defaults	The port mode is set to access port by default	
Command Modes	Privileged EXEC/ User EXEC	
Usage Guidelines	<p>Disgarding the current operation mode of the port, this command will change the port to access mode and the following changes will automatically apply:</p> <p>Forces the acceptable frame type to be set to "untagged AND priority tagged"</p> <p>Sets PVID to specified a VLAN</p> <p>Changes the port into an untagged member of a specified VLAN and removes this port from any other VLANs.</p> <p>Sets the port mode to access mode</p>	
Examples	moxa(config-if)# switchport access vlan 10	
Error Messages	N/A	
Related Commands	show vlan port config show vlan	

## Configure VLAN Management

### Commands

**management vlan** <vlan-id>

**no management vlan** <vlan>

Syntax Description	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>management</b>	Configure management
	<b>vlan</b>	Configure the management VLAN
	vlan-id	The management VLAN ID
Defaults	The default management VLAN ID is set to 1	
Command Modes	Privileged EXEC/ User EXEC	
Usage Guidelines	N/A	
Examples	moxa(config)# management vlan 1	
Error Messages	N/A	
Related Commands	N/A	

## Show VLAN Statistic

### Commands

**show vlan statistics** [vlan <vlan-range>]

Syntax Description	<b>show</b>	Display configuration/statistics/general information
	<b>vlan</b>	Configure VLAN parameters
	<b>statistics</b>	Display VLAN-related statistics
	vlan	Display the VLAN
	vlan-range	Display the VLAN range
Defaults	N/A	
Command Modes	Privileged EXEC/ User EXEC	
Usage Guidelines	N/A	
Examples	<pre>moxa# show vlan statistics vlan 3</pre> <p>Software Statistics Disabled</p> <p>Unicast/broadcast Vlan statistics</p>	
Error Messages	N/A	
Related Commands	N/A	

## GARP

### Show GARP Timer

#### Commands

**show garp timer** [port {port-channel <integer> | <interface-type> <interface-id>}]

Syntax Description	<b>show</b>	Display configuration/statistics/general information																																														
	<b>garp timer</b>	Display GARP timer information																																														
	interface-type	The Ethernet type																																														
	port-channel	The port-channel																																														
	interface-id	The slot number/port number																																														
Defaults	N/A																																															
Command Modes	Privileged EXEC/ User EXEC																																															
Usage Guidelines	N/A																																															
Examples	<pre>moxa# show garp timer</pre> <p>Garp Port Timer Info (in milli seconds)</p> <p>-----</p> <table border="1"> <thead> <tr> <th>Port</th> <th>Join-time</th> <th>Leave-time</th> <th>Leave-all-time</th> </tr> <tr> <th>----</th> <th>-----</th> <th>-----</th> <th>-----</th> </tr> </thead> <tbody> <tr> <td>Eth1/1</td> <td>200</td> <td>600</td> <td>10000</td> </tr> <tr> <td>Eth1/2</td> <td>200</td> <td>600</td> <td>10000</td> </tr> <tr> <td>Eth1/3</td> <td>200</td> <td>600</td> <td>10000</td> </tr> <tr> <td>Eth1/4</td> <td>200</td> <td>600</td> <td>10000</td> </tr> <tr> <td>Eth2/1</td> <td>200</td> <td>600</td> <td>10000</td> </tr> <tr> <td>Eth2/2</td> <td>200</td> <td>600</td> <td>10000</td> </tr> <tr> <td>Eth2/3</td> <td>200</td> <td>600</td> <td>10000</td> </tr> <tr> <td>Eth2/4</td> <td>200</td> <td>600</td> <td>10000</td> </tr> <tr> <td>....</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>				Port	Join-time	Leave-time	Leave-all-time	----	-----	-----	-----	Eth1/1	200	600	10000	Eth1/2	200	600	10000	Eth1/3	200	600	10000	Eth1/4	200	600	10000	Eth2/1	200	600	10000	Eth2/2	200	600	10000	Eth2/3	200	600	10000	Eth2/4	200	600	10000	....			
Port	Join-time	Leave-time	Leave-all-time																																													
----	-----	-----	-----																																													
Eth1/1	200	600	10000																																													
Eth1/2	200	600	10000																																													
Eth1/3	200	600	10000																																													
Eth1/4	200	600	10000																																													
Eth2/1	200	600	10000																																													
Eth2/2	200	600	10000																																													
Eth2/3	200	600	10000																																													
Eth2/4	200	600	10000																																													
....																																																
Error Messages	N/A																																															
Related Commands	garp timer no shutdown garp																																															

## MAC

### Static Unicast

#### Configure a Static Unicast MAC Address in the Forwarding Database

##### Commands

**config mac-address-table static unicast** <aa:aa:aa:aa:aa:aa> vlan <vlan-id> **set** [interface ([<interface-type> <slot/port-port,slot/port,...>] [<interface-type> <slot/port-port,slot/port,...>] [port-channel <a,b,c-d>] )] [status { permanent }]

**config no mac-address-table static unicast** <aa:aa:aa:aa:aa:aa> vlan <vlan-id>

Syntax Description	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>mac-address-table</b>	Configure MAC address table parameters
	<b>static</b>	Statically configured MAC address
	<b>unicast</b>	The unicast MAC address
	<b>set</b>	Overwrite port
	interface-type	The Ethernet type The port-channel
	interface-id	The slot number/port number
	status	Specify the status of the static unicast entry: permanent - entry remains even after the next reset of the bridge
Defaults	N/A	
Command Modes	Privileged EXEC/ User EXEC	
Usage Guidelines	N/A	
Examples	moxa(config)# mac-address-table static unicast aa:aa:aa:bb:bb:cc vlan 168 set interface ethernet 2/4 status permanent	
Error Messages	N/A	
Related Commands	mac-address-table static multicast vlan vlan ports add show mac-address-table static unicast	

## MAC Address Table

### Show MAC Address Table Information

#### Commands

**show mac-address-table** [vlan <vlan-range>] [address <aa:aa:aa:aa:aa:aa>] [interface <interface-type> <interface-id> ]

**show mac-address-table aging-time**

**show mac-address-table count** [vlan <vlan-id>]

**show mac-address-table dynamic multicast** [vlan <vlan-range>] [address <aa:aa:aa:aa:aa:aa>] [interface {port-channel <integer> | <interface-type> <interface-id> }]

**show mac-address-table dynamic unicast** [vlan <vlan-range>] [address <aa:aa:aa:aa:aa:aa>] [interface {port-channel <integer> | <interface-type> <interface-id> }]

**show mac-address-table static multicast** [vlan <vlan-range>] [address <aa:aa:aa:aa:aa:aa>] [interface {port-channel <integer> | <interface-type> <interface-id> }]

**show mac-address-table static unicast** [vlan <vlan-range>] [address <aa:aa:aa:aa:aa:aa>] [interface {port-channel <integer> | <interface-type> <interface-id> }]

Syntax Description	<b>mac-address-table</b>	Display MAC address information
	<b>address</b>	The MAC address entry
	<b>aging-time</b>	The maximum age of a MAC address table entry
	<b>count</b>	The number of MAC addresses present on all VLANs or on a specified VLAN
	<b>dynamic</b>	Dynamically learned MAC address
	<b>static</b>	Statically configured MAC address
	<b>multicast</b>	The multicast MAC address
	<b>unicast</b>	The unicast MAC address
	vlan	The VLAN interface
	vlan-range	The VLAN ID range for which the details will be displayed. This value ranges from 1 to 4094. For example, 4000-4010 will show information for those VLAN IDs.
	interface-type port-channel	The Ethernet type The port-channel
	interface-id	The slot number/port number
Defaults	N/A	
Command Modes	Privileged EXEC/ User EXEC	
Usage Guidelines	N/A	
Examples	<pre>moxa# show mac-address-table  vlan   Mac Address           Type    ConnectionId    Ports ----   - 1      00:00:5e:00:01:02    Learnt 1      00:21:cc:62:f7:0b    Learnt 1      00:21:cc:72:a8:d7    Learnt  Total Mac Addresses displayed: 3</pre>	
Error Messages	N/A	
Related Commands	mac-address-table	

# QoS

## Classification

### Configure Mapping Rule for DSCP Priority

#### Commands

**qos ip-dscp-mapping dscp-priority** <dscp-priority(0-63)> cos-priority <cos-priority(0-7)>

Syntax Description	<b>qos</b>	Configure QoS parameters
	<b>ip-dscp-mapping</b>	Configure mapping rules for DSCP priority
	<b>dscp-priority</b>	The DSCP priority
	dscp-priority (0-63)	The Differentiated Services Code Point (DSCP) value
	cos-priority	The CoS priority
	cos-priority (0-7)	The Class of Service (CoS) value
Defaults	N/A	
Command Modes	Privileged EXEC Global Configuration	
Usage Guidelines	N/A	
Examples	moxa (config)# qos ip-dscp-mapping dscp-priority 0 cos-priority 1	
Error Messages	N/A	
Related Commands	moxa # show qos ip-dscp-mapping [dscp-priority <integer (0-63)>]	

### Configure COS Mapping Rule

#### Commands

**qos cos-mapping cos-priority** <cos-priority(0-7)> queue-id <queue-id(1-8)>

Syntax Description	<b>qos</b>	Configure QoS parameters
	<b>cos-mapping</b>	Configure mapping rules for CoS priority
	<b>cos-priority</b>	The CoS priority
	cos-priority (0-7)	The VLAN priority
	queue-id	The queue index
	queue-id (1-8)	The queue index value, ranging from 1 to 8
Defaults	N/A	
Command Modes	Global Configuration Mode	
Usage Guidelines	N/A	
Examples	moxa (config)# qos cos-mapping cos-priority 1 queue-id 2	
Error Messages	N/A	
Related Commands	moxa# show qos cos-mapping [cos-priority <integer (0-7)>]	

## Configure QoS Default Priority Setting

### Commands

**qos default-priority** <default-priority(0-7)>

Syntax Description	<b>qos</b>	Configure QoS parameters
	<b>default-priority</b>	Configure the default user priority
	default-priority (0-7)	The VLAN priority
Defaults	N/A	
Command Modes	Interface Configuration Mode	
Usage Guidelines	N/A	
Examples	moxa (config-if)# qos default-priority 1	
Error Messages	N/A	
Related Commands	moxa # show qos defaultPriority [ interface <iftyp> <ifnum> ]	

## Configure QoS P-bit Preference

### Commands

**qos pbit-preference** {dscp | cos}

Syntax Description	<b>qos</b>	Configure QoS parameters
	<b>pbit-preference</b>	Configure pbit preference parameters
	dscp	Use DSCP priority
	cos	Use CoS priority
Defaults	N/A	
Command Modes	Interface Configuration Mode	
Usage Guidelines	N/A	
Examples	moxa (config-if)#qos pbit-preference dscp	
Error Messages	N/A	
Related Commands	moxa # show qos pbit-preference [interface <iftyp> <ifnum>]	



## Show QoS DSCP Mapping Rule

### Commands

**show qos ip-dscp-mapping** [dscp-priority <integer (0-63)>]

Syntax Description	<b>show</b>	Display configuration/status information
	<b>qos</b>	Display QoS information
	<b>ip-dscp-mapping</b>	Display the QoS DSCP mapping table
	dscp-priority	The DSCP priority
	dscp-priority (0-63)	The Differentiated Services Code Point (DSCP) value
Defaults	N/A	
Command Modes	Privileged EXEC Mode	
Usage Guidelines	N/A	
Examples	<pre> moxa # show qos ip-dscp-mapping dscp-priority 1  QoS DSCP Priority Mapping ----- Dscp Priority  1 mapping to CoS Priority 0  moxa# show qos ip-dscp-mapping  QoS DSCP Priority Mapping ----- Dscp Priority  0 mapping to CoS Priority 0 Dscp Priority  1 mapping to CoS Priority 0 Dscp Priority  2 mapping to CoS Priority 0 Dscp Priority  3 mapping to CoS Priority 0 Dscp Priority  4 mapping to CoS Priority 0 Dscp Priority  5 mapping to CoS Priority 0 Dscp Priority  6 mapping to CoS Priority 0 ..... Dscp Priority 63 mapping to CoS Priority 7 </pre>	
Error Messages	N/A	
Related Commands	<pre> moxa (config)# qos ip-dscp-mapping dscp-priority &lt;dscp-priority(0-63)&gt; cos-priority &lt;cos-priority(0-7)&gt; </pre>	

## Show QoS CoS Mapping Rule

### Commands

**show qos cos-mapping** [cos-priority <integer (0-7)>]

Syntax Description	<b>show</b>	Display configuration/status information
	<b>qos</b>	Display QoS information
	<b>cos-mapping</b>	Display the QoS CoS mapping table
	cos-priority	The CoS priority
	cos-priority (0-7)	The VLAN priority value
Defaults	N/A	
Command Modes	Privileged EXEC Mode	
Usage Guidelines	N/A	
Examples	<pre>moxa# show qos cos-mapping cos-priority 1  QoS CoS Priority Mapping ----- CoS Priority 1 mapping to Queue ID 2  moxa # show qos cos-mapping  QoS CoS Priority Mapping ----- CoS Priority 0 mapping to Queue ID 1 CoS Priority 1 mapping to Queue ID 2 CoS Priority 2 mapping to Queue ID 3 CoS Priority 3 mapping to Queue ID 4 CoS Priority 4 mapping to Queue ID 5 CoS Priority 5 mapping to Queue ID 6 CoS Priority 6 mapping to Queue ID 7 CoS Priority 7 mapping to Queue ID 8</pre>	
Error Messages	N/A	
Related Commands	moxa (config)# qos cos-mapping cos-priority <cos-priority(0-7)> queue-id <queue-id(1-8)>	

## Show QoS Default Priority Setting

### Commands

**show qos defaultPriority** [ interface <iftype> <ifnum> ]

Syntax Description	<b>show</b>	Display configuration/status information
	<b>qos</b>	Display QoS information
	<b>default-priority</b>	Display the QoS default user priority
	interface	Interface information
	iftype	The interface type
	ifnum	The interface index
Defaults	N/A	
Command Modes	Privileged EXEC Mode	
Usage Guidelines	N/A	
Examples	<pre>moxa # show qos default-priority interface ethernet 1/1  QoS Default Priority ----- Interface Ethernet 1/1 Default Priority is 3  moxa # show qos default-priority  QoS Default Priority ----- Interface Ethernet 1/1 Default Priority is 3 Interface Ethernet 1/2 Default Priority is 3 Interface Ethernet 1/3 Default Priority is 3 Interface Ethernet 1/4 Default Priority is 3 Interface Ethernet 2/1 Default Priority is 3 Interface Ethernet 2/2 Default Priority is 3 ..... Interface Ethernet 7/4 Default Priority is 3</pre>	
Error Messages	N/A	
Related Commands	moxa (config)# qos default-priority <default-priority(0-7)>	

## Show QoS P-bit Preference

### Commands

**show qos pbit-preference** [interface <iftype> <ifnum>]

Syntax Description	<b>show</b>	Display configuration/status information
	<b>qos</b>	Display QoS information
	<b>pbit-preference</b>	Display the pbit preference
	interface	Interface information
	iftype	The interface type
	ifnum	The interface index
Defaults	N/A	
Command Modes	Privileged EXEC Mode	
Usage Guidelines	If no interface is entered, the QoS pbit preference is shown for all ports.	
Examples	<pre>moxa # show qos pbit-preference interface ethernet 1/1  QoS P-bit Preference Status ----- Interface Ethernet 1/1 P-bit Preference is CoS  moxa # show qos pbit-preference  QoS P-bit Preference Status ----- Interface Ethernet 1/1 P-bit Preference is CoS Interface Ethernet 1/2 P-bit Preference is CoS Interface Ethernet 1/3 P-bit Preference is CoS Interface Ethernet 1/4 P-bit Preference is CoS Interface Ethernet 2/1 P-bit Preference is CoS Interface Ethernet 2/2 P-bit Preference is CoS Interface Ethernet 2/3 P-bit Preference is CoS Interface Ethernet 2/4 P-bit Preference is CoS ..... Interface Ethernet 7/4 P-bit Preference is CoS</pre>	
Error Messages	N/A	
Related Commands	moxa (config)# qos pbit-preference {dscp   cos}	

## Ingress Rate Limit

### Configure Ingress Rate Limit Simple Token Bucket Conform Action: None

#### Commands

**qos rate-limit-type simple-token-bucket cir** <cir(1-1000)> [cbs <cbs(10-10240)>] **conform-action do-nothing violate-action drop**

Syntax Description	<b>qos</b>	Configure QoS parameters
	<b>rate-limit-type</b>	Configure QoS rate limit parameters
	<b>simple-token-bucket</b>	Simple Token Bucket
	<b>cir</b>	Committed Information Rate
	cir(1-1000)	Committed information rate in Mbps
	<b>cbs</b>	Committed Burst Size
	cbs(10-10240)	Committed burst size in KByte
	<b>conform-action</b>	Configure the conform action parameter
	<b>do-nothin</b>	Do not perform any action
	<b>violate-action</b>	Configure the violate action parameter
	<b>drop</b>	Drop the packet
Defaults	N/A	
Command Modes	Interface configuration mode	
Usage Guidelines	N/A	
Examples	moxa (config-if)# qos rate-limit-type simple-token-bucket cir 100 cbs 2000 conform-action do-nothing violate-action drop	
Error Messages	'Invalid: {} is greater than the maximum of {}'.format(pre_m_obj['meterCirValue'], max_rate) 'Invalid: {} is greater than the maximum of {}'.format(pre_m_obj['shaperCirValue'], max_rate) 'Invalid: {} is greater than the maximum of {}'.format(pre_m_obj['shaperCbsValue'], max_size) 'Invalid: {} is greater than the maximum of {}'.format(pre_m_obj[key], max_size) 'Invalid: In Simple token bucket mode, when violation action is not drop, conform action and violate action should be the same.'	
Related Commands	moxa # show qos rate-limit [interface <iftyp> <ifnum>	

## Configure Ingress Rate Limit Simple Token Bucket Conform Action:

### Remark-cos

#### Commands

**qos rate-limit-type simple-token-bucket cir** <cir(1-1000)> [cbs <cbs(10-10240)>] **conform-action remark-cos** <cos-priority(0-7)> **violate-action** {drop | remark-cos <cos-priority(0-7)>}

Syntax Description	<b>qos</b>	Configure QoS parameters
	<b>rate-limit-type</b>	Configure QoS rate limit parameters
	<b>simple-token-bucket</b>	Simple Token Bucket
	<b>cir</b>	Committed Information Rate
	Cir (1-1000)	Committed information rate in Mbps
	<b>cbs</b>	Committed Burst Size
	Cbs (10-10240)	Committed burst size in KByte
	<b>conform-action</b>	Configure the conform action parameter
	<b>remark-cos</b>	Remark packet CoS priority
	cos-priority (0-7)	The VLAN priority value
	<b>violate-action</b>	Configure the violate action parameter
	<b>drop</b>	Drop the packet
	<b>remark-cos</b>	Remark the packet CoS priority
	cos-priority (0-7)	The VLAN priority value
Defaults	N/A	
Command Modes	Interface configuration mode	
Usage Guidelines	N/A	
Examples	moxa (config-if)# qos rate-limit-type simple-token-bucket cir 500 cbs 2000 conform-action remark-cos 6 violate-action drop	
Error Messages	'Invalid: {} is greater than the maximum of {}'.format(pre_m_obj['meterCirValue'], max_rate) 'Invalid: {} is greater than the maximum of {}'.format(pre_m_obj['shaperCirValue'], max_rate) 'Invalid: {} is greater than the maximum of {}'.format(pre_m_obj['shaperCbsValue'], max_size) 'Invalid: {} is greater than the maximum of {}'.format(pre_m_obj[key], max_size) 'Invalid: In Simple token bucket mode, when violation action is not drop, conform action and violate action should be the same.'	
Related Commands	moxa # show qos rate-limit [interface <iftyp> <ifnum>]	

## Configure Ingress Rate Limit Simple Token Bucket Conform Action:

### Remark-dscp

#### Commands

**qos rate-limit-type simple-token-bucket cir** <cir(1-1000)> [cbs <cbs(10-10240)>] **conform-action remark-dscp** <dscp-priority(0-63)> **violate-action** {drop | remark-dscp <dscp-priority(0-63)>}

Syntax Description	<b>qos</b>	Configure QoS parameters
	<b>rate-limit-type</b>	Configure QoS rate limit parameters
	<b>simple-token-bucket</b>	Simple Token Bucket
	<b>cir</b>	Committed Information Rate
	Cir (1-1000)	Committed information rate in Mbps
	<b>cbs</b>	Committed Burst Size
	cbs (10-10240)	Committed burst size in KByte
	<b>conform-action</b>	Configure the conform action parameter
	<b>remark-dscp</b>	Remark the packet DSCP priority
	dscp-priority (0-63)	The Differentiated Services Code Point (DSCP) value
	<b>violate-action</b>	Configure the violate action parameter
	<b>drop</b>	Drop the packet
	<b>remark-dscp</b>	Remark the packet DSCP priority
dscp-priority (0-63)	The Differentiated Services Code Point (DSCP) value	
Defaults	N/A	
Command Modes	Interface configuration mode	
Usage Guidelines	N/A	
Examples	moxa (config-if)# qos rate-limit-type simple-token-bucket cir 500 cbs 2000 conform-action remark-dscp 50 violate-action drop	
Error Messages	'Invalid: {} is greater than the maximum of {}'.format(pre_m_obj['meterCirValue'], max_rate) 'Invalid: {} is greater than the maximum of {}'.format(pre_m_obj['shaperCirValue'], max_rate) 'Invalid: {} is greater than the maximum of {}'.format(pre_m_obj['shaperCbsValue'], max_size) 'Invalid: {} is greater than the maximum of {}'.format(pre_m_obj[key], max_size) 'Invalid: In Simple token bucket mode, when violation action is not drop, conform action and violate action should be the same.'	
Related Commands	moxa # show qos rate-limit [interface <iftyp> <ifnum>]	

## Configure Ingress Rate Limit srTCM Conform Action: None

### Commands

**qos rate-limit-type srtcm cir** <cir(1-1000)> [cbs <cbs(1-10240)>] [ebs <ebs(1-10240)>] **conform-action none exceed-action drop violate-action drop**

Syntax Description	<b>qos</b>	Configure QoS parameters
	<b>rate-limit-type</b>	Configure QoS rate limit parameters
	<b>srtcm</b>	Single Rate Three Color Marker
	<b>cir</b>	Committed Information Rate
	cir (1-1000)	Committed information rate in Mbps
	<b>cbs</b>	Committed Burst Size
	cbs (10-10240)	Committed burst size in KByte
	<b>ebs</b>	Excess Burst Size (or PBS)
	ebs (10-10240)	Excess burst size that unit of KByte
	<b>conform-action</b>	Configure the conform action parameter
	<b>none</b>	Do not perform any action
	<b>exceed-action</b>	Configure the exceed action parameter
	<b>drop</b>	Drop the packet
	<b>violate-action</b>	Configure the violate action parameter
<b>drop</b>	Drop the packet	
Defaults	N/A	
Command Modes	Interface configuration mode	
Usage Guidelines	N/A	
Examples	moxa (config-if)# qos rate-limit-type srtcm cir 500 cbs 2000 ebs 2500 conform-action none exceed-action drop violate-action drop	
Error Messages	'Invalid: {} is greater than the maximum of {}'.format(pre_m_obj['meterCirValue'], max_rate) 'Invalid: {} is greater than the maximum of {}'.format(pre_m_obj['shaperCirValue'], max_rate) 'Invalid: {} is greater than the maximum of {}'.format(pre_m_obj['shaperCbsValue'], max_size) 'Invalid: {} is greater than the maximum of {}'.format(pre_m_obj[key], max_size) 'Invalid: In srTCM mode, when exceed action is remark-cos, conform action should be remark-cos and violate action should not be remark-dscp.' 'Invalid: In srTCM mode, when exceed action is remark-dscp, conform action should be remark-dscp and violate action should not be remark-cos.'	
Related Commands	moxa # show qos rate-limit [interface <iftyp> <ifnum>]	



## Configure Ingress Rate Limit srTCM Conform Action: Remark-cos

### Commands

**qos rate-limit-type srtcm cir** <cir(1-1000)> [**cbs** <cbs(10-10240)>] [**ebs** <ebs(10-10240)>] **conform-action remark-cos** <cos-priority(0-7)> **exceed-action** {drop | remark-cos <cos-priority(0-7)>} **violate-action** {drop | remark-cos <cos-priority(0-7)>}

Syntax Description	<b>qos</b>	Configure QoS parameters
	<b>rate-limit-type</b>	Configure QoS rate limit parameters
	<b>srtcm</b>	Single Rate Three Color Marker
	<b>cir</b>	Committed Information Rate
	xir (1-1000)	Committed information rate in Mbps
	<b>cbs</b>	Committed Burst Size
	cbs (10-10240)	Committed burst size that in KByte
	<b>ebs</b>	Excess Burst Size (or PBS)
	ebs (10-10240)	Excess burst size in KByte
	<b>conform-action</b>	Configure the conform action parameter
	<b>remark-cos</b>	Remark the packet CoS priority
	cos-priority (0-7)	The VLAN priority value
	<b>exceed-action</b>	Configure the exceed action parameter
	<b>drop</b>	Drop the packet
	<b>remark-cos</b>	Remark the packet CoS priority
	cos-priority (0-7)	The VLAN priority value
	<b>violate-action</b>	Configure the violate action parameter
<b>drop</b>	Drop the packet	
<b>remark-cos</b>	Remark the packet CoS priority	
cos-priority (0-7)	The VLAN priority value	
Defaults	N/A	
Command Modes	Interface configuration mode	
Usage Guidelines	N/A	
Examples	moxa (config-if)# qos rate-limit-type srtcm cir 500 cbs 2000 ebs 2500 conform-action remark-cos 7 exceed-action drop violate-action drop	
Error Messages	'Invalid: {} is greater than the maximum of {}'.format(pre_m_obj['meterCirValue'], max_rate) 'Invalid: {} is greater than the maximum of {}'.format(pre_m_obj['shaperCirValue'], max_rate) 'Invalid: {} is greater than the maximum of {}'.format(pre_m_obj['shaperCbsValue'], max_size) 'Invalid: {} is greater than the maximum of {}'.format(pre_m_obj[key], max_size) 'Invalid: In srTCM mode, when exceed action is remark-cos, conform action should be remark-cos and violate action should not be remark-dscp.' 'Invalid: In srTCM mode, when exceed action is remark-dscp, conform action should be remark-dscp and violate action should not be remark-cos.'	
Related Commands	moxa # show qos rate-limit [interface <iftyp> <ifnum>]	

## Configure Ingress Rate Limit srTCM Conform Action: Remark-dscp

### Commands

**qos rate-limit-type srtcm cir** <cir(1-1000)> [cbs <cbs(10-10240)>] [ebs <ebs(10-10240)>] **conform-action remark-dscp** <dscp-priority(0-63)> **exceed-action** {drop | remark-dscp <dscp-priority(0-63)>} **violate-action** {drop | remark-dscp <dscp-priority(0-63)>}

Syntax Description	<b>qos</b>	Configure QoS parameters
	<b>rate-limit-type</b>	Configure QoS rate limit parameters
	<b>srtcm</b>	Single Rate Three Color Marker
	<b>cir</b>	Committed Information Rate
	cir (1-1000)	Committed information rate in Mbps
	<b>cbs</b>	Committed Burst Size
	cbs (10-10240)	Committed burst size in KByte
	<b>ebs</b>	Excess Burst Size (or PBS)
	ebs (10-10240)	Excess burst size that in KByte
	<b>conform-action</b>	Configure the conform action parameter
	<b>remark-cos</b>	Remark the packet CoS priority
	dscp-priority (0-7)	Differentiated Services Code Point(DSCP) value
	<b>exceed-action</b>	Configure the exceed action parameter
	<b>drop</b>	Drop the packet
	<b>remark-cos</b>	Remark the packet CoS priority
	dscp-priority (0-7)	The Differentiated Services Code Point (DSCP) value
	<b>violate-action</b>	Configure the violate action parameter
<b>drop</b>	Drop the packet	
<b>remark-cos</b>	Remark the packet CoS priority	
<dscp-priority(0-7)>	The Differentiated Services Code Point (DSCP) value	
Defaults	N/A	
Command Modes	Interface configuration mode	
Usage Guidelines	N/A	
Examples	moxa (config-if)# qos rate-limit-type srtcm cir 500 cbs 2000 ebs 2500 conform-action remark-cos 7 exceed-action drop violate-action drop	
Error Messages	'Invalid: {} is greater than the maximum of {}'.format(pre_m_obj['meterCirValue'], max_rate) 'Invalid: {} is greater than the maximum of {}'.format(pre_m_obj['shaperCirValue'], max_rate) 'Invalid: {} is greater than the maximum of {}'.format(pre_m_obj['shaperCbsValue'], max_size) 'Invalid: {} is greater than the maximum of {}'.format(pre_m_obj[key], max_size) 'Invalid: In srTCM mode, when exceed action is remark-cos, conform action should be remark-cos and violate action should not be remark-dscp.' 'Invalid: In srTCM mode, when exceed action is remark-dscp, conform action should be remark-dscp and violate action should not be remark-cos.'	
Related Commands	moxa # show qos rate-limit [interface <iftyp> <ifnum>]	

## Show Ingress Rate Limit Parameters

### Commands

**show qos rate-limit** [interface <iftype> <ifnum>]

Syntax Description	<b>show</b>	Display configuration/status information
	<b>qos</b>	Display QoS information
	<b>rate-limit</b>	Display QoS rate limit information
	interface	Interface information
	iftype	The interface type
	ifnum	The interface index
Defaults	N/A	
Command Modes	Privileged EXEC Mode	
Usage Guidelines	N/A	
Examples	<pre> moxa # show qos rate-limit interface ethernet 1/1  QoS Rate Limit Statue of Interface Ethernet 1/1 ----- Meter Type           : Simple Token Bucket CIR                  : Disable CBS                  : Disable EBS                  : Disable Color Mode           : Blind Confirm Action       : None Remark CoS Value     : None Remark DSCP Value    : None Exceed Action        : Drop Remark CoS Value     : None Remark DSCP Value    : None Violate Action       : Drop Remark CoS Value     : None Remark DSCP Value    : None  moxa # show qos rate-limit  QoS Rate Limit Statue of Interface Ethernet 1/1 ----- Meter Type           : Simple Token Bucket CIR                  : Disable CBS                  : Disable EBS                  : Disable Color Mode           : Blind Confirm Action       : None Remark CoS Value     : None Remark DSCP Value    : None Exceed Action        : Drop Remark CoS Value     : None Remark DSCP Value    : None Violate Action       : Drop Remark CoS Value     : None Remark DSCP Value    : None  QoS Rate Limit Statue of Interface Ethernet 1/2 ----- </pre>	

	Meter Type : Simple Token Bucket CIR : Disable CBS : Disable EBS : Disable Color Mode : Blind .....
Error Messages	N/A
Related Commands	moxa(config-if)# qos rate-limit-type {simple-token-bucket   rtcm} [cir <cir(1-1000)>] [cbs <cbs(1-10240)>] [ebs <ebs(1-10240)>] [conform-action {none   remark-cos <cos-priority(0-7)>   remark-dscp <dscp-priority(0-63)>}] [exceed-action {drop   remark-cos <cos-priority(0-7)>   remark-dscp <dscp-priority(0-63)>}] [violate-action {drop   remark-cos <cos-priority(0-7)>   remark-dscp <dscp-priority(0-63)>}]

## Scheduler

### Configure Qos Scheduler Type Setting

#### Commands

**qos scheduler-type** {strict-priority | wrr}

Syntax Description	<b>qos</b>	Configure QoS parameters
	<b>scheduler-type</b>	Configure QoS scheduler parameters
	strict-priority	Strict Priority
	wrr	Weighted Round Robin
Defaults	The QoS scheduler type is set to strict priority by default	
Command Modes	Interface configuration mode	
Usage Guidelines	N/A	
Examples	moxa (config-if)# qos scheduler-type wrr	
Error Messages	N/A	
Related Commands	moxa # show qos scheduler [ interface <iftype> <ifnum> ]	

## Show QoS Scheduler Setting

### Commands

**show qos scheduler** [ interface <iftype> <ifnum> ]

Syntax Description	<b>show</b>	Display configuration/status information
	<b>qos</b>	Display QoS information
	<b>scheduler</b>	Display QoS scheduler
	interface	The interface information
	iftype	The interface type
	ifnum	The interface index
Defaults	N/A	
Command Modes	Privileged EXEC mode	
Usage Guidelines	N/A	
Examples	<pre> moxa # show qos scheduler interface ethernet 1/1  QoS Scheduler Algorithm ----- Interface Ethernet 1/1 Scheduler Algorithm is : Strict Priority  moxa# show qos scheduler  QoS Scheduler Algorithm ----- Interface Ethernet 1/1 Scheduler Algorithm is : Strict Priority Interface Ethernet 1/2 Scheduler Algorithm is : Strict Priority Interface Ethernet 1/3 Scheduler Algorithm is : Strict Priority Interface Ethernet 1/4 Scheduler Algorithm is : Strict Priority Interface Ethernet 2/1 Scheduler Algorithm is : Strict Priority Interface Ethernet 2/2 Scheduler Algorithm is : Strict Priority Interface Ethernet 2/3 Scheduler Algorithm is : Strict Priority Interface Ethernet 2/4 Scheduler Algorithm is : Strict Priority Interface Ethernet 3/1 Scheduler Algorithm is : Strict Priority ..... </pre>	
Error Messages	N/A	
Related Commands	moxa (config-if)# qos scheduler-type {strict-priority   wrr}	

## Egress Shaper

### Configure Shaper Setting

#### Commands

**qos shaper** cir <cir(1-1000)> **cbs** <cbs(10-10240)>

Syntax Description	<b>qos</b>	Configure QoS parameters
	<b>shaper</b>	Configure QoS shaper parameters
	cir	Committed Information Rate
	cir (1-1000)	The Committed Information Rate in Kbps
	<b>cbs</b>	Committed Burst Size
	cbs (10-10240)	The Committed Burst Size in KByte
Defaults	N/A	
Command Modes	Interface configuration mode	
Usage Guidelines	N/A	
Examples	moxa (config-if)# qos shaper cir 500 cbs 2000	
Error Messages	N/A	
Related Commands	moxa# show qos shaper [interface <iftype> <ifnum>]	

### Show Shaper Setting

#### Commands

**show qos shaper** [interface <iftype> <ifnum>]

Syntax Description	<b>show</b>	Display configuration/status information
	<b>qos</b>	Display QoS information
	<b>shaper</b>	Display QoS shaper information
	interface	The interface information
	iftype	The interface type
	ifnum	The interface index
Defaults	N/A	
Command Modes	Privileged EXEC Mode	
Usage Guidelines	N/A	
Examples	<pre>moxa# show qos shaper interface ethernet 1/1 QoS Shaper Statue of Interface Ethernet 1/1 ----- CIR : 1000 CBS : 2000 -----  moxa# show qos shaper QoS Shaper Statue of Interface Ethernet 1/1 ----- CIR : Disable CBS : Disable  QoS Shaper Statue of Interface Ethernet 1/2 ----- CIR : Disable CBS : Disable .....</pre>	
Error Messages	N/A	
Related Commands	moxa(config-if)# qos shaper cir <cir(1-1000)> cbs <cbs(10-10240)>	

## Multicast

### IGMP Snooping

#### Enable/disable System-based IGMP Snooping

##### Commands

**igmp-snooping** {enable | disable}

Syntax Description	<b>igmp-snooping</b>	Configure IGMP Snooping parameters
	enable	Enable system-based IGMP Snooping
	disable	Disable system-based IGMP Snooping
Defaults	N/A	
Command Modes	Global Configuration	
Usage Guidelines	GMRP has to be disabled in order to enable GMP snooping	
Examples	<pre>moxa# configure terminal moxa(config)# igmp-snooping enable  moxa# configure terminal moxa(config)# igmp-snooping disable</pre>	
Error Messages	<pre>'Invalid: If IGMP snooping is enabled, then GMRP must be disabled.'</pre> <pre>'Invalid: VLAN ID cannot have duplicated data.'</pre> <pre>'Invalid: VLAN ID must exist in the VLAN configuration.'</pre> <pre>'Invalid: The port-channel does not exist.'</pre> <pre>'Invalid: this port is a member port of port-channel.'</pre> <pre>'Invalid: this port is not a member port of VLAN.'</pre>	
Related Commands	moxa# show igmp-snooping globals	

#### Configure VLAN-based IGMP Snooping

##### Commands

**igmp-snooping**

**no igmp-snooping**

Syntax Description	<b>igmp-snooping</b>	Configure IGMP Snooping parameters
	<b>no</b>	Remove configuration/delete entry/reset to default value
Defaults	VLAN-based IGMP Snooping is disabled by default	
Command Modes	Config-VLAN Mode	
Usage Guidelines	N/A	
Examples	<pre>moxa# configure terminal moxa(config)# vlan 2 moxa(config-vlan)# igmp-snooping  moxa# configure terminal moxa(config)# vlan 2 moxa(config-vlan)# no igmp-snooping</pre>	
Error Messages	<pre>'Invalid: If IGMP snooping is enabled, then GMRP must be disabled.'</pre> <pre>'Invalid: VLAN ID cannot have duplicated data.'</pre> <pre>'Invalid: VLAN ID must exist in the VLAN configuration.'</pre> <pre>'Invalid: The port-channel does not exist.'</pre> <pre>'Invalid: this port is a member port of port-channel.'</pre> <pre>'Invalid: this port is not a member port of VLAN.'</pre>	
Related Commands	moxa# show igmp snooping [vlan < vlanid> ]	

## Configure IGMP Querier Role

### Commands

**igmp-snooping querier**

**no igmp-snooping querier**

Syntax Description	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>igmp-snooping</b>	Configure IGMP Snooping parameters
	<b>querier</b>	Configure the IGMP Snooping role
Defaults	By default, the switch is configured as a non-querier	
Command Modes	Config-VLAN Mode	
Usage Guidelines	N/A	
Examples	<pre>moxa# configure terminal moxa(config)# vlan 2 moxa(config-vlan)# igmp-snooping moxa(config-vlan)# igmp-snooping querier  moxa# configure terminal moxa(config)# vlan 2 moxa(config-vlan)# igmp-snooping moxa(config-vlan)# no igmp-snooping querier</pre>	
Error Messages	<p>'Invalid: If IGMP snooping is enabled, then GMRP must be disabled.'</p> <p>'Invalid: VLAN ID ca not have duplicated data.'</p> <p>'Invalid: VLAN ID must exist in the VLAN configuration.'</p> <p>'Invalid: The port-channel does not exist.'</p> <p>'Invalid: this port is a member port of port-channel.'</p> <p>'Invalid: this port is not a member port of VLAN.'</p>	
Related Commands	moxa# show igmp-snooping [vlan < vlanid> ]	

## Configure IGMP Snooping Version

### Commands

**igmp-snooping version {v1 | v2 | v3}**

Syntax Description	<b>igmp-snooping</b>	Configure IGMP Snooping parameters
	<b>version</b>	The operating version of the IGMP Snooping switch for a specific VLAN
	v1	Configure IGMP Snooping to Version 1
	v2	Configure IGMP Snooping to Version 2
	v3	Configure IGMP Snooping to Version 3
Defaults	The default IGMP Snooping version is v2	
Command Modes	Config-VLAN Mode	
Usage Guidelines	N/A	
Examples	<pre>moxa# configure terminal moxa(config)# vlan 2 moxa(config-vlan)# igmp-snooping moxa(config-vlan)# igmp-snooping version v3</pre>	
Error Messages	<p>'Invalid: If IGMP snooping is enabled, then GMRP must be disabled.'</p> <p>'Invalid: VLAN ID cannot have duplicated data.'</p> <p>'Invalid: VLAN ID must exist in the VLAN configuration.'</p> <p>'Invalid: The port-channel does not exist.'</p> <p>'Invalid: this port is a member port of port-channel.'</p> <p>'Invalid: this port is not a member port of VLAN.'</p>	
Related Commands	moxa# show igmp-snooping [vlan < vlanid> ]	



## Configure IGMP Snooping General Query Interval

### Commands

**igmp-snooping query-interval** <integer (20 - 600) second>

**no igmp-snooping query-interval**

Syntax Description	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>igmp-snooping</b>	Configure IGMP Snooping parameters
	<b>query-interval</b>	The interval in which the general queries are sent by the IGMP Snooping switch when configured as a querier
	integer (20-600)	The general query interval period in seconds
Defaults	The default IGMP Snooping general query interval is set to 125 seconds	
Command Modes	Config-VLAN Mode	
Usage Guidelines	N/A	
Examples	<pre>moxa# configure terminal moxa(config)# vlan 2 moxa(config-vlan)# igmp-snooping query-interval 200  moxa# configure terminal moxa(config)# vlan 2 moxa(config-vlan)# no igmp-snooping query-interval</pre>	
Error Messages	<pre>'Invalid: If IGMP snooping is enabled, then GMRP must be disabled.'</pre> <pre>'Invalid: VLAN ID cannot have duplicated data.'</pre> <pre>'Invalid: VLAN ID must exist in the VLAN configuration.'</pre> <pre>'Invalid: The port-channel does not exist.'</pre> <pre>'Invalid: this port is a member port of port-channel.'</pre> <pre>'Invalid: this port is not a member port of VLAN.'</pre>	
Related Commands	moxa# show igmp-snooping [vlan <vlanid> ]	

## Assign IGMP Snooping Router Port

### Commands

**igmp-snooping router-port** [<interface-type> <slot/port-port,slot/port,...>] [port-channel <integer>]

**no igmp-snooping router-port** [<interface-type> <slot/port-port,slot/port,...>] [port-channel <integer>]

Syntax Description	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>igmp-snooping</b>	Configure IGMP Snooping parameters
	<b>router-port</b>	The IGMP Snooping router port status
	interface-type	The interface type
	slot/port-port, slot/port,	The interface list (slot number/port ID, slot number/port ID-port ID....)
	port-channel	The port-channel interface
	integer	The port-channel index
Defaults	N/A	
Command Modes	Config-VLAN Mode	
Usage Guidelines	IGMP snooping of VLAN must enabled	
Examples	<pre>moxa# configure terminal moxa(config)# vlan 2 moxa(config-vlan)# igmp-snooping moxa(config-vlan)# igmp-snooping router-port ethernet 1/1-3 ----- moxa# configure terminal moxa(config)# vlan 2 moxa(config-vlan)# igmp-snooping moxa(config-vlan)# no igmp-snooping router-port ethernet 1/1-3</pre>	
Error Messages	<p>'Invalid: If IGMP snooping is enabled, then GMRP must be disabled.'</p> <p>'Invalid: VLAN ID cannot have duplicated data.'</p> <p>'Invalid: VLAN ID must exist in the VLAN configuration.'</p> <p>'Invalid: The port-channel does not exist.'</p> <p>'Invalid: this port is a member port of port-channel.'</p> <p>'Invalid: this port is not a member port of VLAN.'</p>	
Related Commands	moxa# show igmp-snooping router-port [Vlan <vlan-id/vfi-id>]	

## Show System IGMP Snooping Information

### Commands

#### show igmp-snooping globals

Syntax Description	<b>show</b>	Display configuration/status information
	<b>igmp-snooping</b>	Display IGMP Snooping information
	<b>globals</b>	IGMP Snooping system-based information
Defaults	N/A	
Command Modes	User EXEC Privileged EXEC	
Usage Guidelines	N/A	
Examples	moxa# show igmp-snooping globals IGMP Snooping global status is enabled	
Error Messages	'Invalid: If IGMP snooping is enabled, then GMRP must be disabled.' 'Invalid: VLAN ID cannot have duplicated data.' 'Invalid: VLAN ID must exist in the VLAN configuration.' 'Invalid: The port-channel does not exist.' 'Invalid: this port is a member port of port-channel.' 'Invalid: this port is not a member port of VLAN.'	
Related Commands	moxa(config)# igmp-snooping {enable   disable}	

## Show IGMP Information of VLAN

### Commands

#### show igmp-snooping [vlan <vlan-id/vfi-id>]

Syntax Description	<b>show</b>	Display configuration/status information
	<b>igmp-snooping</b>	Display IGMP Snooping information
	<b>vlan</b>	Protocol specific information for the VLAN
	vlan-id/vfi-id	The VLAN ID range between 1-4094 and the VFI ID range between 4096-65535
Defaults	N/A	
Command Modes	User EXEC Privileged EXEC	
Usage Guidelines	N/A	
Examples	moxa# show igmp-snooping vlan 1  IGMP Snooping VLAN Configuration for the VLAN 1  IGMP Snooping enabled IGMP Snooping cmoxaonfigured version V2 IGMP Snooping is configured as Non-Querier IGMP Snooping is acting as Non-Querier General Query Interval is 125 seconds Startup Query Interval is 31 seconds Startup Query Count is 2 Other Querier Present Interval is 255 seconds	
Error Messages	'Invalid: If IGMP snooping is enabled, then GMRP must be disabled.' 'Invalid: VLAN ID cannot have duplicated data.' 'Invalid: VLAN ID must exist in the VLAN configuration.' 'Invalid: The port-channel does not exist.' 'Invalid: this port is a member port of port-channel.' 'Invalid: this port is not a member port of VLAN.'	
Related Commands	moxa(config-vlan)# igmp-snooping moxa(config-vlan)# igmp-snooping querier moxa(config-vlan)# igmp-snooping version {v1   v2   v3} moxa(config-vlan)# igmp-snooping query-interval <(20 - 600) second>	

## Show IGMP Information of Forwarding Database

### Commands

**show igmp-snooping forwarding-database** [vlan <vlan-id/vfi-id>]

Syntax Description	<b>show</b>	Display configuration/status information																
	<b>igmp-snooping</b>	Display IGMP Snooping information																
	<b>forwarding-database</b>	Display the forwarding database																
	vlan	Protocol specific information for the VLAN																
	vlan-id/vfi-id	The VLAN ID range between 1-4094 and the VFI ID range between 4096-65535																
Defaults	N/A																	
Command Modes	User EXEC Privileged EXEC																	
Usage Guidelines	N/A																	
Examples	<pre>moxa# show igmp-snooping forwarding-database vlan1</pre> <table border="1"> <thead> <tr> <th>VLAN</th> <th>Group Address</th> <th>Source Address</th> <th>Port List</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>12.0.0.10</td> <td>227.1.1.1</td> <td>Eth1/1, Eth1/3, Eth1/4</td> </tr> <tr> <td>1</td> <td>12.0.0.20</td> <td>227.1.1.1</td> <td>Eth1/1, Eth1/3, Eth1/4</td> </tr> <tr> <td>1</td> <td>12.0.0.30</td> <td>227.1.1.1</td> <td>Eth1/1, Eth1/2, Eth1/4</td> </tr> </tbody> </table>		VLAN	Group Address	Source Address	Port List	1	12.0.0.10	227.1.1.1	Eth1/1, Eth1/3, Eth1/4	1	12.0.0.20	227.1.1.1	Eth1/1, Eth1/3, Eth1/4	1	12.0.0.30	227.1.1.1	Eth1/1, Eth1/2, Eth1/4
VLAN	Group Address	Source Address	Port List															
1	12.0.0.10	227.1.1.1	Eth1/1, Eth1/3, Eth1/4															
1	12.0.0.20	227.1.1.1	Eth1/1, Eth1/3, Eth1/4															
1	12.0.0.30	227.1.1.1	Eth1/1, Eth1/2, Eth1/4															
Error Messages	'Invalid: If IGMP snooping is enabled, then GMRP must be disabled.' 'Invalid: VLAN ID cannot have duplicated data.' 'Invalid: VLAN ID must exist in the VLAN configuration.' 'Invalid: The port-channel does not exist.' 'Invalid: this port is a member port of port-channel.' 'Invalid: this port is not a member port of VLAN.'																	
Related Commands	N/A																	

## Show IGMP Information of Group Membership Table

### Commands

**show igmp-snooping groups** [Vlan <vlan-id/vfi-id>]

Syntax Description	<b>show</b>	Display configuration/status information										
	<b>igmp-snooping</b>	Display IGMP Snooping information										
	<b>groups</b>	The group table information										
	vlan	Protocol specific information for the VLAN										
	vlan-id/vfi-id	The VLAN ID range between 1-4094 and the VFI ID range between 4096-65535										
Defaults	N/A											
Command Modes	User EXEC Privileged EXEC											
Usage Guidelines	N/A											
Examples	<pre>moxa# show igmp-snooping groups vlan 1</pre> <table border="1"> <thead> <tr> <th>VLAN</th> <th>Group Address</th> <th>Filter Mode</th> <th>Port List</th> <th>Source Address</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>224.1.1.1</td> <td>EXCLUDE</td> <td>Eth 1/1</td> <td>192.168.127.251</td> </tr> </tbody> </table>		VLAN	Group Address	Filter Mode	Port List	Source Address	1	224.1.1.1	EXCLUDE	Eth 1/1	192.168.127.251
VLAN	Group Address	Filter Mode	Port List	Source Address								
1	224.1.1.1	EXCLUDE	Eth 1/1	192.168.127.251								
Error Messages	'Invalid: If IGMP snooping is enabled, then GMRP must be disabled.' 'Invalid: VLAN ID cannot have duplicated data.' 'Invalid: VLAN ID must exist in the VLAN configuration.' 'Invalid: The port-channel does not exist.' 'Invalid: this port is a member port of port-channel.' 'Invalid: this port is not a member port of VLAN.'											
Related Commands	N/A											

## Show IGMP Information of Router Port

### Commands

**show igmp-snooping router-port** [vlan <vlan-id/vfi-id>]

Syntax Description	<b>show</b>	Display configuration/status information
	<b>igmp-snooping</b>	Display IGMP Snooping information
	<b>router-port</b>	The IGMP Snooping router port status
	vlan	Protocol specific information for the VLAN
	vlan-id/vfi-id	The VLAN ID range between 1-4094 and the VFI ID range between 4096-65535
Defaults	N/A	
Command Modes	User EXEC Privileged EXEC	
Usage Guidelines	N/A	
Examples	<pre>moxa# show igmp-snooping router-port  VLAN Static Router Port List -----   1 Eth 1/1  VLAN Dynamic Router Port List ----- 1 Eth 1/3</pre>	
Error Messages	<p>'Invalid: If IGMP snooping is enabled, then GMRP must be disabled.'</p> <p>'Invalid: VLAN ID cannot have duplicated data.'</p> <p>'Invalid: VLAN ID must exist in the VLAN configuration.'</p> <p>'Invalid: The port-channel does not exist.'</p> <p>'Invalid: this port is a member port of port-channel.'</p> <p>'Invalid: this port is not a member port of VLAN.'</p>	
Related Commands	<pre>moxa(config-vlan)# igmp-snooping router-port [&lt;interface-type&gt; &lt;slot/port- port,slot/port,...&gt;] [port-channel &lt;integer&gt;]</pre>	

## GMRP

### Show Global GMRP information

#### Commands

#### show vlan device info

Syntax Description	<b>show</b>	Display configuration/statistics/general information
	<b>vlan device info</b>	Display the VLAN device information
Defaults	N/A	
Command Modes	Privileged EXEC Mode.	
Usage Guidelines	N/A	
Examples	<pre> moxa# show vlan device info vlan device configurations ----- vlan Status : Enabled vlan Oper status : Enabled gvrp status : Disabled gmrp status : Disabled gvrp Oper status : Disabled gmrp Oper status : Disabled Mac-vlan Status : Disabled Subnet-vlan Status : Disabled Protocol-Vlan Status : Enabled Bridge Mode : Provider Edge Bridge Base-Bridge Mode : Vlan Aware Bridge Traffic Classes : Enabled vlan Operational Learning Mode : IVL Hybrid Default Learning Mode : IVL Version number : 1 Max Vlan id : 4158 Max supported vlans : 4160 Global mac learning status : Enabled Filtering Utility Criteria : Enabled Unicast mac learning limit : 768 </pre>	
Error Messages	N/A	
Related Commands	moxa(config)# set gmrp enable	

## Show Port GMRP Information

### Commands

**show vlan port config** [{port <interface-id> }]

Syntax Description	<b>show</b>	Display configuration/statistics/general information
	<b>vlan port config</b>	Display VLAN port configuration
	port interface-id	The input port number
Defaults	N/A	
Command Modes	Privileged EXEC Mode.	
Usage Guidelines	N/A	
Examples	<pre> moxa# show vlan port config 1/1  vlan Port configuration table -----  Port 1-1 Bridge Port Type           : Customer Bridge Port Port Vlan ID               : 1 Port Acceptable Frame Type : Admit All Port Mac Learning Status   : Enabled Port Ingress Filtering     : Disabled Port Mode                  : Hybrid Port Gvrp Status           : Enabled Port Gmrp Status           : Disabled Port Gvrp Failed Registrations : 0 Gvrp last pdu origin      : 00:00:00:00:00:00 Port Restricted Vlan Registration : Disabled Port Restricted Group Registration : Enabled Mac Based Support          : Disabled Subnet Based Support       : Disabled Port-and-Protocol Based Support : Enabled Default Priority           : 0 Filtering Utility Criteria : Default Port Protected Status      : Disabled Ingress EtherType         : 0x8100 Egress EtherType          : 0x8100 Egress TPID Type          : Portbased Allowable TPID 1          : 0x0 Allowable TPID 2          : 0x0 Allowable TPID 3          : 0x0 Reflection Status         : Disabled </pre>	
Error Messages	N/A	
Related Commands	<pre> moxa(config)# set port gmrp enable moxa(config-if)# group restrict enable </pre>	



## Configure GMRP Global Setting

### Commands

**gmrp** { enable | disable }

Syntax Description	<b>gmrp</b>	Configure the GMRP parameters
	enable	Enable GMRP on all switch ports and automatically start the GARP on the switch if the GARP is disabled.
	disable	Disable GMRP on all switch ports.
Defaults	Global GMRP is enabled by default	
Command Modes	Global Configuration Mode	
Usage Guidelines	N/A	
Examples	moxa# configure terminal moxa(config)# gmrp enable	
Error Messages	N/A	
Related Commands	moxa# show vlan device info	

## Configure GMRP Port Setting

### Commands

**gmrp**

**no gmrp**

Syntax Description	<b>gmrp</b>	Configure the GMRP parameters
Defaults	GMRP is enabled by default	
Command Modes	Interface Configuration Mode	
Usage Guidelines	N/A	
Examples	moxa# interface ethernet 1/1 moxa(config-if)# no gmrp	
Error Messages	N/A	
Related Commands	moxa# show vlan port config	

## Configure GMRP Group Restricted Setting

### Commands

**group restricted** {enable | disable }

Syntax Description	<b>group restricted</b>	Configure the restricted group registration on a specified port
	enable	Enable restricted group registration on the port
	disable	Disable restricted group registration on the port
Defaults	GMRP group restriction is disabled by default	
Command Modes	Interface Configuration Mode	
Usage Guidelines	N/A	
Examples	moxa# configure terminal moxa(config)# interface ethernet 1/1 moxa(config-if)# group restricted	
Error Messages	Wrong interface type for port	
Related Commands	moxa# show vlan port config	

## Static Multicast

### Show MAC Address Table for Static Multicast

#### Commands

**show mac-address-table static multicast** [vlan <vlan-range>] [address <aa:aa:aa:aa:aa:aa>][{interface {port-channel <integer> | <interface-type> <interface-id>}]

Syntax Description	<b>mac-address-table</b>	Display the MAC address table information
	<b>static multicast</b>	Display static multicast address information
	vlan <vlan-range>	Display all entries in the FDB table for the specified VLANs
	address <aa:aa:aa:aa:aa:aa>	Display the specified multicast MAC address in the FDB table
	Interface <interface-type> <interface-id> / Port-channel <integer>	Display all specified interface entries in the FDB table
Defaults	N/A	
Command Modes	Privileged EXEC User EXEC	
Usage Guidelines	Display static multicast address table	
Examples	<pre>moxa# show mac-address-table static multicast Static Multicast Table ----- Vlan : 1 Mac Address : 01:02:03:04:05:06 Member Ports : Eth1/1 Forbidden Ports : Eth1/2 Status : Permanent ----- Total Mac Addresses displayed: 1</pre>	
Error Messages	N/A	
Related Commands	mac-address-table static multicast	

## Configure MAC Address Table for Static Multicast

### Commands

**mac-address-table static multicast** <aa:aa:aa:aa:aa:aa> vlan <vlan-id> {add | set} interface  
 [<interface-type> <slot/port-port,slot/port,...>] [port-channel | <integer>] [forbidden-ports  
 [<interface-type> <slot/port-port,slot/port,...>] [port-channel <integer>]] [status permanent]

Syntax Description	<b>mac-address-table</b>	Configure the MAC address table
	<b>static multicast</b>	Configure the static multicast address
	aa:aa:aa:aa:aa:aa	The multicast destination MAC address
	vlan <vlan-id>	The VLAN ID of the VLAN the multicast destination MAC address belongs to
	add	Add the new interface port and forbidden port.
	Set	Overwrite the new interface port and forbidden port
	interface	Configure member ports details.
	forbidden-ports	Configure the set of ports to which frames destined for a specific multicast MAC address must not be forwarded, such as from GMRP.
	status	The status of the static multicast entry.
	permanent	Entry remains even after the next reset of the bridge
Defaults	N/A	
Command Modes	Privileged EXEC Global Configuration	
Usage Guidelines	Configure the static multicast address	
Examples	moxa(config)# mac-address-table static multicast 01:02:03:04:05:06 vlan 1 add interface ethernet 1/1-2 forbidden-ports ethernet 2/1-2	
Error Messages	"Invalid: Duplicate MAC Address." "Invalid: Configuration fail." "Invalid: The port is not included in VLAN egress ports." "Invalid: The MAC+VID entry must be removed from Port Security first." "Invalid: The port must remove from port security." "Invalid: Reserved multicast address (01:80:C2) is not allowed to set static multicast." "Invalid: Egress Ports and Forbidden Ports are overlapping."	
Related Commands	show mac-address-table static multicast	

# Network Redundancy

## Layer 2 Redundancy

### Spanning Tree

#### Enable/Disable Spanning Tree

##### Commands

**spanning-tree**

**no spanning-tree**

Syntax Description	<b>no</b>	Disable the configuration/delete the entry/reset to default value
	<b>spanning-tree</b>	Configure Spanning Tree Protocol parameters
Defaults	Spanning Tree Protocol is disabled by default	
Command Modes	Interface Configuration	
Usage Guidelines	N/A	
Examples	<pre>moxa# configure terminal moxa(config)# interface ethernet 1/1 moxa(config-if)# spanning-tree moxa(config-if)# no spanning-tree</pre>	
Error Messages	Invalid: Port channel member port cannot be assigned to a redundant protocol. Invalid: Redundant Protocol and Port Security cannot be enabled on the same port. Invalid: Redundant Protocol and 802.1x/MAB cannot be enabled on the same port. Invalid: The port-channel group does not exist.	
Related Commands	<pre>show spanning-tree detail show spanning-tree summary</pre>	

#### Configure Spanning Tree Compatibility

##### Commands

**spanning-tree compatibility { stp | rstp }**

**no spanning-tree compatibility**

Syntax Description	<b>no</b>	Disable the configuration/delete the entry/resets to default value
	<b>spanning-tree</b>	Configure Spanning Tree Protocol parameters
	<b>compatibility</b>	The Spanning Tree compatibility version
	stp	Spanning Tree Protocol configuration
	rstp	Rapid Spanning Tree configuration
Defaults	Spanning Tree Protocol compatibility is set to rstp by default.	
Command Modes	Global Configuration	
Usage Guidelines	The "no spanning-tree compatibility" command will restore the default value	
Examples	<pre>moxa# configure terminal moxa(config)# spanning-tree compatibility stp moxa(config)# spanning-tree compatibility rstp moxa(config)# no spanning-tree compatibility</pre>	
Error Messages	N/A	
Related Commands	<pre>show spanning-tree show spanning-tree detail</pre>	

## Configure Spanning Tree Priority

### Commands

**spanning-tree priority** <value (0-61440)>

**no spanning-tree priority**

Syntax Description	<b>no</b>	Disable the configuration / deletes the entry / resets to default value
	<b>spanning-tree</b>	Configure Spanning Tree Protocol parameters
	<b>priority</b>	Configure switch priority for Spanning Tree instances
	value	The switch priority value ranging from 0 to 61440
Defaults	The default priority is set to 32768	
Command Modes	Global Configuration	
Usage Guidelines	The "no spanning-tree priority" command will restore the default value	
Examples	moxa# configure terminal moxa(config)# spanning-tree priority 61440 moxa(config)# no spanning-tree priority	
Error Messages	N/A	
Related Commands	show spanning-tree show spanning-tree detail	

## Configure Spanning Tree Forward Time

### Commands

**spanning-tree forward-time** <seconds (4-30)>

**no spanning-tree forward-time**

Syntax Description	<b>no</b>	Disable the configuration/deletes the entry/resets to default value
	<b>spanning-tree</b>	Configure Spanning Tree Protocol parameters
	<b>forward-time</b>	The interval (in seconds) in which a port stays in its current state before moving to next state
	seconds	The forwarding time ranging from 4 to 30 seconds
Defaults	The default forwarding time is 15 seconds	
Command Modes	Global Configuration	
Usage Guidelines	Command "no spanning-tree forward-time" will reset to default value $2 * (\text{ForwardDelay} - 1) \geq \text{MaxAge} \geq 2 * (\text{Hello Time} + 1)$	
Examples	moxa# configure terminal moxa(config)# spanning-tree forward-time 16 moxa(config)# no spanning-tree forward-time	
Error Messages	% RSTP: $2 * (\text{Forward time} - 1) \geq \text{Max age time} \geq 2 * (\text{Hello time} + 1)$	
Related Commands	show spanning-tree show spanning-tree detail	

## Configure Spanning Tree Hello Time

### Commands

**spanning-tree hello-time** <seconds (1-2)>

**no spanning-tree hello-time**

Syntax Description	<b>no</b>	Disable the configuration/deletes the entry/resets to default value
	<b>spanning-tree</b>	Configure Spanning Tree Protocol parameters
	<b>hello-time</b>	The interval (in seconds) between the transmission of configuration BPDUs
	seconds	The hello time interval ranging from 1 to 2 seconds
Defaults	The default hello time is set to 2 seconds	
Command Modes	Global Configuration	
Usage Guidelines	The "no spanning-tree hello-time" command will restore the default value $2 * (\text{ForwardDelay} - 1) \geq \text{MaxAge} \geq 2 * (\text{Hello Time} + 1)$	
Examples	<pre>moxa# configure terminal moxa(config)# spanning-tree hello-time 1 moxa(config)# no spanning-tree hello-time</pre>	
Error Messages	% RSTP: $2 * (\text{Forward time} - 1) \geq \text{Max age time} \geq 2 * (\text{Hello time} + 1)$	
Related Commands	<pre>show spanning-tree show spanning-tree detail</pre>	

## Configure Spanning Tree Maximum Age

### Commands

**spanning-tree max-age** <seconds (6-40)>

**no spanning-tree max-age**

Syntax Description	<b>no</b>	Disable the configuration/delete the entry/reset to default value
	<b>spanning-tree</b>	Configure Spanning Tree Protocol parameters
	<b>max-age</b>	The maximum age (in seconds) before learnt STP information is discarded
	seconds	The maximum age ranging from 6 to 40 seconds
Defaults	The STP maximum age is set to 20 seconds by default	
Command Modes	Global Configuration	
Usage Guidelines	The "no spanning-tree max-age" command will restore the default value $2 * (\text{ForwardDelay} - 1) \geq \text{MaxAge} \geq 2 * (\text{Hello Time} + 1)$	
Examples	<pre>moxa# configure terminal moxa(config)# spanning-tree max-age 21 moxa(config)# no spanning-tree max-age</pre>	
Error Messages	% RSTP: $2 * (\text{Forward time} - 1) \geq \text{Max age time} \geq 2 * (\text{Hello time} + 1)$	
Related Commands	<pre>show spanning-tree show spanning-tree detail</pre>	

## Configure Spanning Tree Transmission Hold Counter

### Commands

**spanning-tree transmit hold-count** <value (1-10)>

**no spanning-tree transmit hold-count**

Syntax Description	<b>no</b>	Disable the configuration/delete the entry/reset to default value
	<b>spanning-tree</b>	Configure Spanning Tree Protocol
	<b>transmit</b>	Transmission hold counter configuration
	<b>hold-count</b>	Configure the hold counter to limit the maximum transmission rate of the switch
	value	The transmission hold counter value ranging from 1 to 10
Defaults	The STP hold counter is set to 6 by default	
Command Modes	Global Configuration	
Usage Guidelines	The "no spanning-tree transmit hold-count" command will restore the default value	
Examples	moxa# configure terminal moxa(config)# spanning-tree transmit hold-count 10 moxa(config)# no spanning-tree transmit hold-count	
Error Messages	N/A	
Related Commands	show spanning-tree detail	

## Configure Spanning Tree Auto-edge

### Commands

**spanning-tree auto-edge**

**no spanning-tree auto-edge**

Syntax Description	<b>no</b>	Disable the configuration/delete the entry/reset to default value
	<b>spanning-tree</b>	Configure Spanning Tree Protocol
	<b>auto-edge</b>	Configure the automatic detection of bridges attached to an interface
Defaults	Spanning Tree auto-edge is enabled by default	
Command Modes	Interface Configuration	
Usage Guidelines	N/A	
Examples	moxa# configure terminal moxa(config)# interface ethernet 1/1 moxa(config-if)# spanning-tree auto-edge moxa(config-if)# no spanning-tree auto-edge	
Error Messages	N/A	
Related Commands	show spanning-tree detail show spanning-tree interface ethernet 1/1 detail	

## Configure Spanning Tree Cost

### Commands

**spanning-tree cost** <value (0-200000000)>

**no spanning-tree cost**

Syntax Description	<b>no</b>	Disable the configuration/delete the entry/reset to default value
	<b>spanning-tree</b>	Configure Spanning Tree Protocol
	<b>cost</b>	Configure the path cost
	value	The Spanning Tree cost ranging from 0 to 200000000
Defaults	The default path cost is set to 0	
Command Modes	Interface Configuration	
Usage Guidelines	The "spanning-tree cost 0" command will auto-detect the cost based on port speed The "no spanning-tree cost" command will restore the default value	
Examples	moxa# configure terminal moxa(config)# interface ethernet 1/1 moxa(config-if)# spanning-tree cost 20000 moxa(config-if)# no spanning-tree cost	
Error Messages	N/A	
Related Commands	show spanning-tree detail show spanning-tree interface ethernet 1/1 detail show spanning-tree interface ethernet 1/1 detail	

## Configure Spanning Tree Link Type

### Commands

**spanning-tree link-type** { point-to-point | shared }

**no spanning-tree link-type**

Syntax Description	<b>no</b>	Disable the configuration/delete the entry/reset to default value
	<b>spanning-tree</b>	Configure Spanning Tree Protocol parameters
	<b>link-type</b>	Configure the link type as a point-to-point link or as a shared LAN segment on which another bridge is present
	point-to-point	Set the link a a point-to-point link
	shared	Set the link as a shared link
Defaults	The default Spanning Tree link-type is set to auto-detect	
Command Modes	Interface Configuration	
Usage Guidelines	The "no spanning-tree link-type" command will auto-detect the interface link type based on the port duplex mode	
Examples	moxa# configure terminal moxa(config)# interface ethernet 1/1 moxa(config-if)# spanning-tree link-type point-to-point moxa(config-if)# spanning-tree link-type shared moxa(config-if)# no spanning-tree link-type	
Error Messages	N/A	
Related Commands	show spanning-tree detail show spanning-tree interface ethernet 1/1 show spanning-tree interface ethernet 1/1 detail	



## Configure Spanning Tree Portfast

### Commands

**spanning-tree portfast**

**no spanning-tree portfast**

Syntax Description	<b>no</b>	Disable the configuration/delete the entry/reset to default value
	<b>spanning-tree</b>	Configure Spanning Tree Protocol parameters
	<b>portfast</b>	Specify ports that have only hosts connected to enable immediate transition to a forwarding state
Defaults	Spanning Tree Portfast is disabled by default	
Command Modes	Interface Configuration	
Usage Guidelines	Shut down the interface before enabling the Portfast function The Portfast function cannot be enabled on a port that has loop guard enabled	
Examples	moxa# configure terminal moxa(config)# interface ethernet 1/1 moxa(config-if)# spanning-tree portfast moxa(config-if)# no spanning-tree portfast	
Error Messages	N/A	
Related Commands	show spanning-tree detail show spanning-tree interface ethernet 1/1 show spanning-tree interface ethernet 1/1 detail	

## Configure Spanning Tree Port Priority

### Commands

**spanning-tree port-priority <value (0-240)>**

**no spanning-tree port-priority**

Syntax Description	<b>no</b>	Disable the configuration/delete the entry/reset to default value
	<b>spanning-tree</b>	Configure Spanning Tree Protocol parameters
	<b>port-priority</b>	Configure the port priority value
	value	The Spanning Tree port priority ranging from 0 to 240
Defaults	The default Spanning Tree port priority is set to 128	
Command Modes	Interface Configuration	
Usage Guidelines	The "no spanning-tree port-priority" command will restore the default value	
Examples	moxa# configure terminal moxa(config)# interface ethernet 1/1 moxa(config-if)# spanning-tree port-priority 16 moxa(config-if)# no spanning-tree port-priority	
Error Messages	N/A	
Related Commands	show spanning-tree detail show spanning-tree interface ethernet 1/1 show spanning-tree interface ethernet 1/1 detail	

## Configure Spanning Tree BPDU Guard

### Commands

**spanning-tree bpduguard**

**no spanning-tree bpduguard**

Syntax Description	<b>no</b>	Disable the configuration/delete the entry/reset to default value
	<b>spanning-tree</b>	Configure Spanning Tree Protocol parameters
	<b>bpduguard</b>	Configures an interface to transition into the error-disabled state when it receives a BPDU
Defaults	Spanning Tree BPDU guard is disabled by default	
Command Modes	Interface Configuration	
Usage Guidelines	N/A	
Examples	moxa# configure terminal moxa(config)# interface ethernet 1/1 moxa(config-if)# spanning-tree bpduguard moxa(config-if)# no spanning-tree bpduguard	
Error Messages	N/A	
Related Commands	show spanning-tree detail show spanning-tree interface gigabitethernet 0/1 bpduguard show spanning-tree interface gigabitethernet 0/1 detail	

## Configure Spanning Tree BPDU Filter

### Commands

**spanning-tree bpdfilter**

**no spanning-tree bpdfilter**

Syntax Description	<b>no</b>	Disable the configuration/delete the entry/reset to default value
	<b>spanning-tree</b>	Configure Spanning Tree Protocol parameters
	<b>bpdfilter</b>	Configure BPDU filtering
Defaults	Spanning Tree BPDU filtering is disabled by default	
Command Modes	Interface Configuration	
Usage Guidelines	N/A	
Examples	moxa# configure terminal moxa(config)# interface ethernet 1/1 moxa(config-if)# spanning-tree bpdfilter moxa(config-if)# no spanning-tree bpdfilter	
Error Messages	N/A	
Related Commands	show spanning-tree detail show spanning-tree interface ethernet 1/1 show spanning-tree interface ethernet 1/1 detail	

## Configure Spanning Tree Root Guard

### Commands

**spanning-tree rootguard**

**no spanning-tree rootguard**

Syntax Description	<b>no</b>	Disable the configuration/delete the entry/reset to default value
	<b>spanning-tree</b>	Configure Spanning Tree Protocol parameters
	<b>rootguard</b>	Configure restricted forwarding on an interface
Defaults	Spanning Tree root guard is disabled by default	
Command Modes	Interface Configuration	
Usage Guidelines	The Root guard function cannot be enabled on a port that has loop guard enabled	
Examples	moxa# configure terminal moxa(config)# interface ethernet 1/1 moxa(config-if)# spanning-tree rootguard moxa(config-if)# no spanning-tree rootguard	
Error Messages	% RSTP: loopGuard and rootGuard should be exclusive	
Related Commands	show spanning-tree detail show spanning-tree interface ethernet 1/1 show spanning-tree interface ethernet 1/1 detail	

## Configure Spanning Tree Loop Guard

### Commands

**spanning-tree loopguard**

**no spanning-tree loopguard**

Syntax Description	<b>no</b>	Disable the configuration/delete the entry/reset to default value
	<b>spanning-tree</b>	Configure Spanning Tree Protocol parameters
	<b>loopguard</b>	Configure restricted forwarding on an interface
Defaults	Spanning Tree loop guard is disabled by default	
Command Modes	Interface Configuration	
Usage Guidelines	The loop guard function cannot be enabled on a port that has portfast enabled The loop guard function cannot be enabled on a port that has root guard enabled	
Examples	moxa# configure terminal moxa(config)# interface ethernet 1/1 moxa(config-if)# spanning-tree loopguard moxa(config-if)# no spanning-tree loopguard	
Error Messages	% RSTP: loopGuard and rootGuard should be exclusive	
Related Commands	show spanning-tree detail show spanning-tree interface ethernet 1/1 show spanning-tree interface ethernet 1/1 detail	

## Configure Spanning Tree Errordisable Recovery Interval

### Commands

**spanning-tree errordisable recovery-interval** <second (30-65535)>

**no spanning-tree errordisable recovery-interval**

Syntax Description	<b>no</b>	Disable the configuration/delete the entry/reset to default value
	<b>spanning-tree</b>	Configure Spanning Tree Protocol
	<b>errordisable</b>	Configure the error-disable timer
	<b>recovery-interval</b>	The interval (in seconds) for a port to recover from error-disabled state
	second	The errordisable recovery interval ranging from 30 to 65535 seconds
Defaults	The default error-disabled recovery interval is set to 300 seconds	
Command Modes	Global Configuration	
Usage Guidelines	N/A	
Examples	moxa(config)# spanning-tree errordisable recovery-interval 30	
Error Messages	N/A	
Related Commands	show spanning-tree detail	

## Clear Spanning Tree Detected Protocols

### Commands

**clear spanning-tree detected protocols interface** { <interface-id> | port-channel <integer> }

Syntax Description	<b>clear</b>	Clear the configuration
	<b>spanning-tree</b>	Configure Spanning Tree Protocol parameters
	<b>detected</b>	Spanning Tree detected protocols
	<b>protocols</b>	Spanning Tree detected protocols
	<b>interface</b>	Configure the interface
	interface-id	The interface ID
	port-channel	The port channel
Defaults	N/A	
Command Modes	User EXEC mode	
Usage Guidelines	N/A	
Examples	moxa# clear spanning-tree detected protocols interface ethernet 1/1 moxa# clear spanning-tree detected protocols interface port-channel 1	
Error Messages	N/A	
Related Commands	N/A	

## Show Spanning Tree Bridge Information

### Commands

#### show spanning-tree bridge

Syntax Description	<b>show</b>	Display the Configuration/statistics/general information
	<b>spanning-tree</b>	Spanning Tree-related information
	<b>bridge</b>	Spanning Tree bridge information
Defaults	N/A	
Command Modes	User EXEC Mode	
Usage Guidelines	N/A	
Examples	<pre>moxa# show spanning-tree bridge  Bridge ID                HelloTime    MaxAge      FwdDly      Protocol -----                - 80:00:00:01:02:03:04:05  2   sec     20   sec     15   sec     rstp  moxa#</pre>	
Error Messages	N/A	
Related Commands	N/A	

## Show Spanning Tree Root Information

### Commands

#### show spanning-tree root

Syntax Description	<b>show</b>	Display the configuration/statistics/general information
	<b>spanning-tree</b>	Spanning Tree-related information
	<b>root</b>	Spanning Tree root information
Defaults	N/A	
Command Modes	User EXEC Mode	
Usage Guidelines	N/A	
Examples	<pre>moxa# show spanning-tree root  Root ID                RootCost    MaxAge      FwdDly      RootPort -----                - 00:00:00:00:00:00:00  0   sec     20   sec     15   sec     0  moxa#</pre>	
Error Messages	N/A	
Related Commands	N/A	

## Show Spanning Tree Interface Information

### Commands

**show spanning-tree interface** { ethernet <slot/port> | port-channel <id> }

**show spanning-tree interface** { ethernet <slot/port> | port-channel <id> } detail

**show spanning-tree interface** { ethernet <slot/port> | port-channel <id> } inconsistency

Syntax Description	<b>show</b>	Display the configuration/statistics/general information															
	<b>spanning-tree</b>	Spanning Tree-related information															
	<b>interface</b>	Spanning Tree interface information															
	ethernet <slot/port>	The Ethernet slot or port number															
	port-channel <id>	The port channel ID															
	detail	Detailed information about the port and bridge															
	inconsistency	Spanning Tree inconsistent state information															
Defaults	N/A																
Command Modes	User EXEC Mode																
Usage Guidelines	N/A																
Examples	<pre>moxa# show spanning-tree interface ethernet 1/2 moxa# show spanning-tree interface ethernet 1/2 inconsistency moxa# show span in eth 1/1</pre> <table border="1"> <thead> <tr> <th>Root</th> <th>State</th> <th>Cost</th> <th>Prio</th> <th>Type</th> </tr> </thead> <tbody> <tr> <td>-----</td> <td>----</td> <td>----</td> <td>----</td> <td>----</td> </tr> <tr> <td>Disabled</td> <td>Disable</td> <td>200000000</td> <td>128</td> <td>SharedLAN</td> </tr> </tbody> </table> <pre>moxa# show span in eth 1/1 incon BPDU Inconsist: False Root Inconsist: False Loop Inconsist: False  moxa#</pre>		Root	State	Cost	Prio	Type	-----	----	----	----	----	Disabled	Disable	200000000	128	SharedLAN
Root	State	Cost	Prio	Type													
-----	----	----	----	----													
Disabled	Disable	200000000	128	SharedLAN													
Error Messages	N/A																
Related Commands	N/A																

## Show Spanning Tree Details

### Commands

**show spanning-tree** [detail]

**show spanning-tree active** [detail]

Syntax Description	<b>show</b>	Display the configuration/statistics/general information
	<b>spanning-tree</b>	Spanning Tree related information
	detail	Detailed Spanning Tree information
	<b>active</b>	Spanning Tree information of active ports
Defaults	N/A	
Command Modes	User EXEC Mode	
Usage Guidelines	N/A	
Examples	<pre>moxa# show spanning-tree Root ID      Priority    0             Address   00:00:00:00:00:00             Cost     0             Port     0             Max Age  20 sec             Forward Delay 15 sec</pre>	

	<pre> Hello Time 2 sec Spanning tree Protocol has been disabled Bridge ID Priority 32768 Address 00:01:02:03:04:05 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec Port Enable Role State Cost Prio Type Eth1/1 Disabled Disabled Disabled 200000000 128 SharedLan Eth1/2 Disabled Disabled Disabled 200000000 128 SharedLan Eth1/3 Disabled Disabled Disabled 200000000 128 SharedLan Eth1/4 Disabled Disabled Disabled 200000000 128 SharedLan  moxa# show spanning-tree detail Spanning tree Protocol has been disabled Bridge Identifier has priority 32768, Address 00:01:02:03:04:05 Configured Hello time 2 sec, Max Age 20 sec Forward Delay 15 sec Number of Topology Changes 0 Time since topology Change 0 seconds ago Transmit Hold-Count 6 Root Times:Max Age 20 sec Forward Delay 15 sec Hello Time 2 sec  Port 1 [Eth1/1] is Disabled, Disabled Port PathCost 200000000, Port Priority 128, Port Identifier 128.1 Designated Root has priority 0, address 00:00:00:00:00:00 Designated Port Id is 0.0, Designated PathCost 0 No of Transition to forwarding State :0 Auto-Edge is disabled PortFast is enabled, Oper-Edge is disabled BPDU Filtering is disabled. BPDU Guard is enabled. Root Guard is disabled. Loop Guard is disabled. Admin LinkType is Auto, Oper LinkType is Shared-Lan BPDUs : sent 0 , received 0 Timers: Hello - 0, Forward Delay - 0, Topology Change - 0, Error Disabled Recovery Interval 300 sec </pre>
Error Messages	N/A
Related Commands	N/A

## Turbo Ring v2

### Show Turbo Ring v2 Status

#### Commands

**show turbo-ring-v2** { config | status }

Syntax Description	<b>show</b>	Display configuration/statistics/general information
	<b>turbo-ring-v2</b>	Display Turbo Ring v2 information
	config	Ring configuration information
	status	Ring status information
Defaults	N/A	
Command Modes	User EXEC/Privileged EXEC	
Usage Guidelines	N/A	
Examples	<pre> moxa# show turbo-ring-v2 config  Turbo Ring V2 Module is enabled   Ring 1:     Enable: enabled   Set as master: disabled     1st port: Eth1/1     2nd port: Eth1/2    Ring 2:     Enable: disabled     Set as master: disabled     1st port: Eth1/3     2nd port: Eth1/4    Coupling:   Enable: disabled   Mode: Ring coupling(primary)   Coupling Port: Eth2/1  moxa# show turbo-ring-v2 status  Turbo Ring V2 status:   Ring 1:     Status: Healthy     Master/Slave: Master   Master ID: 00:90:e8:00:bb:cc     1st Ring Port Status: Eth1/1 Forwarding     2nd Ring Port Status: Eth1/2 Blocked    Ring 2:     Status:---     Master/Slave:---   Master ID: 00:00:00:00:00:00   1st Ring Port Status:---     2nd Ring Port Status:---    Coupling:     Mode:---     Coupling Port: --- </pre>	
Error Messages	N/A	
Related Commands	turbo-ring-v2	



## Configure Redundancy Mode Setting

### Commands

**turbo-ring-v2** { enable | disable }

Syntax Description	<b>turbo-ring-v2</b>	Configure Turbo Ring V2 parameters
	enable	Enable Turbo Ring V2
	disable	Disable Turbo Ring V2
Defaults	Turbo Ring V2 is disabled by default	
Command Modes	Global configuration	
Usage Guidelines	N/A	
Examples	moxa(config)# turbo-ring-v2 enable	
Error Messages	Invalid: A maximum of two redundant protocols can be enabled.	
	Invalid: Turbo Chain and Turbo Ring V2 cannot be enabled at the same time.	
	Invalid: Two redundant protocols cannot use the same port.	
	Invalid: Turbo Ring V2 and STP/RSTP cannot be enabled at the same time.	
Related Commands	show turbo-ring-v2 config	

## Configure Ring Settings

### Commands

**turbo-ring-v2** ring-id **primary interface** { port-channel <integer (1-65535)> | <interface-type> <interface-id> } **secondary interface** { port-channel <integer (1-65535)> | <interface-type> <interface-id> }

**no turbo-ring-v2** ring-id

Syntax Description	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>turbo-ring-v2</b>	Configure Turbo Ring V2 parameters
	ring-id	Configure the ring ID (1-2)
	<b>primary</b>	The first ring port
	<b>interface</b>	The port interface
	interface-type	Ethernet
	interface-id	The slot number/port number <1-7>/<1-4>
	port-channel	The port channel interface
	<b>secondary</b>	The second ring port
	<b>interface</b>	The port interface
	interface-type	Ethernet
	interface-id	The slot number/port number <1-7>/<1-4>
	port-channel	The port channel interface
Defaults	N/A	
Command Modes	Global configuration	
Usage Guidelines	At least one turbo ring domain or coupling must be enabled. Two turbo ring domains and coupling cannot be enabled at the same time.	
Examples	moxa(config)# turbo-ring-v2 1 primary interface ethernet 2/1 secondary interface ethernet 2/2	
Error Messages	Invalid: The first and second ring ports cannot be on the same port.	
	Invalid: A ring port cannot belong to both rings.	
	Invalid: A port channel must be created first to be able to assign to a ring port.	
Related Commands	show turbo-ring-v2 { config   status }	



## Configure Backup Port of Ring Coupling

### Commands

**turbo-ring-v2 coupling backup interface** <interface-type> <interface-id>

**no turbo-ring-v2 coupling**

Syntax Description	<b>turbo-ring-v2</b>	Configure Turbo Ring V2 parameters
	<b>coupling</b>	Configure ring coupling parameters
	<b>backup</b>	Coupling backup mode
	<b>interface</b>	The port interface
	interface-type	Ethernet
	interface-id	The slot number/port number <1-7>/<1-4>
Defaults	N/A	
Command Modes	Global configuration	
Usage Guidelines	At least one turbo ring domain or coupling must be enabled. Two turbo ring domains and coupling cannot be enabled at the same time.	
Examples	moxa(config)# turbo-ring-v2 coupling backup interface ethernet 2/1	
Error Messages	Invalid: Ring coupling cannot be enabled when both rings are enabled. Invalid: There can be one ring enabled if you want to enable ring coupling. Invalid: A ring coupling port cannot be an active ring port.	
Related Commands	show turbo-ring-v2 { config   status }	

## Turbo Chain

### Show Turbo Chain Information

#### Commands

**show turbo-chain**

Syntax Description	<b>show</b>	Display configuration/statistics/general information
	<b>turbo-chain</b>	Display Turbo Chain information
Defaults	N/A	
Command Modes	Privileged EXEC	
Usage Guidelines	N/A	
Examples	<pre>moxa# show turbo-chain Admin Status: Disabled Role: Member Port Role   Port Number Port State ----- Member Port   Eth1/1    --- Member Port   Eth1/2    ---</pre>	
Error Messages	N/A	
Related Commands	N/A	

## Configure Turbo Chain Setting

### Commands

**turbo-chain** { enable | disable }

**turbo-chain role\_**{ head | member | tail } **primary interface\_**{ port-channel <port-channel-id (1-65535)> | <interface-type> <interface-id> } **secondary interface\_**{ port-channel <port-channel-id (1-65535)> | <interface-type> <interface-id> }

Syntax Description	<b>turbo-chain</b>	Configure Turbo Chain parameters
	<b>enable</b>	Enable Turbo Chain
	<b>disable</b>	Disable Turbo Chain
	<b>role</b>	Configure the role of the switch in the Turbo Chain
	head	Set the switch as the Turbo Chain head
	member	Set the switch as a Turbo Chain member
	tail	Set the switch as the Turbo Chain tail
	<b>primary</b>	Configure the Turbo Chain primary port
	<b>interface</b>	The interface of Turbo Chain
	port-channel	The port channel interface
	port-channel-id	The port channel ID
	interface-type	Ethernet interface
	interface-id	Slot number/port number
	<b>secondary</b>	Configure the Turbo Chain secondary port
<b>interface</b>	The interface of Turbo Chain	
Defaults	Turbo Chain is disabled by default	
Command Modes	Global Configuration	
Usage Guidelines	N/A	
Examples	<pre>moxa(config)# turbo-chain disable moxa(config)# turbo-chain role member primary interface ethernet 1/1 secondary interface ethernet 1/2</pre>	
Error Messages	<pre>% Turbo Chain: Invalid: Two Identical Turbo Chain Ports. % Turbo Chain: Invalid: The port-channel does not exist. % Turbo Chain: Invalid: The port-channel does not exist. % L2 Redundancy: Invalid: Two redundant protocols cannot use the same port. % L2 Redundancy: Invalid: Port channel member port cannot be assigned to a redundant protocol. % L2 Redundancy: Invalid: Redundant Protocol and Port Security cannot be enabled on the same port. % L2 Redundancy: Invalid: Redundant Protocol and 802.1x/MAB cannot be enabled on the same port. % L2 Redundancy: Invalid: The port-channel group does not exist. % L2 Redundancy: Invalid: The port-channel group is used by Turbo Ring/Turbo Chain/Dual Homing. It cannot be deleted. % L2 Redundancy: Invalid: A maximum of two redundant protocols can be enabled. % L2 Redundancy: Invalid: Turbo Chain and Turbo Ring V2 cannot be enabled at the same time. % L2 Redundancy: Invalid: Turbo Chain and STP/RSTP cannot be enabled at the same time.</pre>	
Related Commands	show turbo-chain	

## Dual Homing

### Show Dual Homing Information

#### Commands

##### show dual-homing

Syntax Description	<b>show</b>	Show running system information	
	<b>dual-homing</b>	Display dual homing configurations and status	
Defaults	N/A		
Command Modes	Privileged EXEC/User EXEC		
Usage Guidelines	N/A		
Examples	<pre>moxa# show dual-homing  Status           :Enabled Connecting Redundancy Protocol: Turbo Ring v2  ----- Path              Port-Index      Link-Status     Port-State ----- Primary           Link up         Link-up         Forwarding Secondary         Eth1/1Eth1/2   Link-down      Blocking</pre>		
Error Messages	N/A		
Related Commands	dual-homing		

### Enable/Disable Dual Homing Setting

#### Commands

##### dual-homing {enable | disable}

Syntax Description	<b>dual-homing</b>	Configure dual homing parameters
	enable	Enable dual homing
	disable	Disable dual homing
Defaults	N/A	
Command Modes	Global configuration	
Usage Guidelines	N/A	
Examples	moxa (config)# dual-homing enable	
Error Messages	N/A	
Related Commands	N/A	

## Configure Dual Homing Path Mode

### Commands

**dual-homing path-mode** {primary-first | maintain-current}

Syntax Description	<b>dual-homing</b>	Configure dual homing parameters
	<b>path-mode</b>	Configure the dual homing path switching mode
	primary-first	Primary path always first
	maintain-current	Maintain the current path
Defaults	N/A	
Command Modes	redundancy configuration	
Usage Guidelines	N/A	
Examples	moxa(config)# dual-homing path-mode primary-first	
Error Messages	N/A	
Command Modes	N/A	
Related Commands	show dual-homing	

## Configure Dual Homing Primary/Secondary Interface

### Commands

**dual-homing primary interface** {port-channel <integer (1-65535) | <interface-type> <interface-id>}

**secondary interface** {port-channel <integer (1-65535) | <interface-type> <interface-id>}

Syntax Description	<b>dual-homing</b>	Configure dual homing
	<b>primary</b>	Configure the dual homing primary port settings
	<b>interface</b>	Configure the dual homing port interface
	<b>secondary</b>	Configure the dual homing secondary port settings
	<b>port-channel</b>	Configure the port channel
	Integer (1-65535)	The port channel group ID ranging from 1 to 65535
	interface-type	The interface type
interface-id	The interface ID	
Defaults	N/A	
Command Modes	redundancy configuration	
Usage Guidelines	N/A	
Examples	moxa (config)# dual-homing primary interface ethernet 1/1 secondary interface port-channel 1	
Error Messages	N/A	
Command Modes	N/A	
Related Commands	show dual-homing	

# Management

## Network Management

### SNMP

#### Configure SNMP Server Access Mode

##### Commands

**snmp-server access** { enable | disable | read-only }

Syntax Description	<b>snmp-server</b>	Configure SNMP server parameters
	<b>access</b>	Configure the SNMP server access mode
	enable	Enable SNMP server access
	disable	Disable SNMP server access
	read-only	Set SNMP server access to read-only mode
Defaults	SNMP server access is enabled by default	
Command Modes	Global configuration	
Usage Guidelines	N/A	
Examples	moxa(config)# snmp-server access enable moxa(config)# snmp-server access disable moxa(config)# snmp-server access read-only	
Error Messages	N/A	
Related Commands	snmp-server show snmp-server	

#### Configure SNMP Server Read-Only Community Settings

##### Commands

**snmp-server community read-only** <community-name(4-32)>

Syntax Description	<b>snmp-server</b>	Configure snmp-server related parameters
	<b>community</b>	Configure the SNMP server community
	<b>read-only</b>	Configure the SNMP server community for read-only
	string (32)	The SNMP server read-only community name
Defaults	The default read-only community name is set to public	
Command Modes	Global configuration	
Usage Guidelines	N/A	
Examples	moxa(config)# snmp-server community read-only public	
Error Messages	N/A	
Related Commands	snmp-server show snmp-server	

## Delete SNMP Server Read-Only Community

### Commands

**no snmp-server community read-only**

Syntax Description	<b>no</b>	Disable the configuration/delete the entry/reset to default value
	<b>snmp-server</b>	Configure SNMP server parameters
	<b>community</b>	Configure the SNMP server community
	<b>read-only</b>	Configure the SNMP server community for read-only
Defaults	N/A	
Command Modes	Global configuration	
Usage Guidelines	N/A	
Examples	moxa(config)# no snmp-server community read-only	
Error Messages	N/A	
Related Commands	snmp-server show snmp-server	

## Configure SNMP Server Read-Write Community Settings

### Commands

**snmp-server community read-write <community-name(32)>**

Syntax Description	<b>snmp-server</b>	Configure SNMP server parameters
	<b>community</b>	Configure the SNMP server community
	<b>read-write</b>	Configure the SNMP server community for read-write
	string (32)	The SNMP server read-write community name
Defaults	The default read-write community name is set to private	
Command Modes	Global configuration	
Usage Guidelines	N/A	
Examples	moxa(config)# snmp-server community read-write private	
Error Messages	N/A	
Related Commands	snmp-server show snmp-server	

## Configure SNMP Server Read-Write Community to Default Value

### Commands

**no snmp-server community read-write**

Syntax Description	<b>no</b>	Disable the configuration/delete the entry /reset to default value
	<b>snmp-server</b>	Configures SNMP server parameters
	<b>community</b>	Configure the SNMP server community
	<b>read-write</b>	Configure the SNMP server community for read-write
Defaults	N/A	
Command Modes	Global configuration	
Usage Guidelines	N/A	
Examples	moxa(config)# no snmp-server community read-write	
Error Messages	N/A	
Related Commands	snmp-server show snmp-server	



## Configure SNMP Server Version

### Commands

**snmp-server version** { v1-v2c-v3 | v1-v2c | v3 }

Syntax Description	<b>snmp-server</b>	Configure SNMP server parameters
	<b>version</b>	Configure the SNMP server version compatibility
	v1-v2c-v3	Set the SNMP server version to v1-v2c-v3
	v1-v2c	Set the SNMP server version to v1-v2c
	v3	Set the SNMP server version to v3-only
Defaults	The default SNMP server version is set to v1-v2c	
Command Modes	Global configuration	
Usage Guidelines	Set up at least one SNMP server user account before enabling v1-v2c-v3 or v3	
Examples	moxa(config)# snmp-server version v1-v2c-v3 moxa(config)# snmp-server version v1-v2c moxa(config)# snmp-server version v3	
Error Messages	% Atleast setup one valid user before enable snmp-server version v1-v2c-v3 or v3	
Related Commands	snmp-server show snmp-server	

## Configure SNMP Server Version to Default Value

### Commands

**no snmp-server version**

Syntax Description	<b>no</b>	Disable the configuration/delete the entry/reset to default value
	<b>snmp-server</b>	Configure SNMP server parameters
	<b>version</b>	Configure the SNMP server version compatibility
Defaults	The default SNMP server version is set to v1-v2c	
Command Modes	Global configuration	
Usage Guidelines	N/A	
Examples	moxa(config)# no snmp-server version	
Error Messages	N/A	
Related Commands	snmp-server show snmp-server	

## Configure SNMP Server User Account Settings

### Commands

**snmp-server user** <user-name(32)>

**authority** { read-only | read-write }

**auth-type** { none | md5 | sha } [auth-passwd <authentication-password(64)> ] **encryption**  
 { disable| des | aes } [encryption-key <encryption-key(64)>]

Syntax Description	<b>snmp-server</b>	Configure SNMP server parameters
	<b>user</b>	Configure SNMP server user accounts
	user-name (32)	The user name of the SNMP server user account
	<b>authority</b>	Configure the access right for the user account
	read-only	Give read-only access to the user
	read-write	Give read-write access to the user
	<b>auth-type</b>	Configure the authentication protocol for the SNMP server user account
	none	Do not use any authentication protocol
	md5	Use MD5 authentication
	sha	Use SHA authentication
	auth-passwd	Configure the authentication password for the SNMP server user account
	authentication-password (64)	The authentication password
	<b>encryption</b>	Configure the data encryption protocol for the SNMP server user account
	disable	Disable data encryption
	des	Use DES data encryption
	aes	Use AES data encryption
encryption-key	Configure the data encryption key for the SNMP server user account	
encryption-key (64)	The data encryption key	
Defaults	There is no user account table by default	
Command Modes	Global configuration	
Usage Guidelines	If the authentication type is set to none, data encryption should be disabled. If the authentication type is not none, an authentication password must be set up. If data encryption is not disabled, a data encryption key must be set up.	
Examples	<pre>moxa(config)# snmp-server user testNoAuthNoPriv authority read-write auth-type none encryption disable moxa(config)# moxa(config)# moxa(config)# snmp-server user testAuthNoPriv authority read-write auth-type md5 auth-passwd 111111111 encryption disable moxa(config)# moxa(config)# moxa(config)# snmp-server user testAuthPriv authority read-write auth-type md5 auth-passwd 111111111 encryption des encryption-key 222222222 moxa(config)# moxa(config)#</pre>	
Error Messages	<pre>% If authentication-type is none, data-encryption method should be disabled % must setup authentication password % must setup data encryption key % Can't get snmp-server user-account information % Can't get snmp-server user-account table % Can't get snmp-server user-account table index ('%d') % Can't get user-name from snmp-server user-account table('%d')</pre>	

	% Can't create user account % Can't modify user account
Related Commands	snmp-server show snmp-server

## Delete SNMP Server User Account

### Commands

**no snmp-server user** <user-name (32)>

Syntax Description	<b>no</b>	Disable the configuration/delete the entry/reset to default value
	<b>snmp-server</b>	Configure SNMP server parameters
	<b>user</b>	Configure SNMP server user accounts
	user-name (32)	The user name of the SNMP server user account
Defaults	N/A	
Command Modes	Global configuration	
Usage Guidelines	N/A	
Examples	moxa(config)# no snmp-server user testNoAuthNoPriv moxa(config)# no snmp-server user testAuthNoPriv moxa(config)# no snmp-server user testAuthPriv	
Error Messages	% Can't get snmp-server user-account information % Can't get snmp-server user-account table % Can't get snmp-server user-account table index ('%d') % Can't get user-name from snmp-server user-account % Can't delete user account	
Related Commands	snmp-server show snmp-server	

## Configure SNMP Trap Host Settings

### Commands

**snmp-trap host** <host-address(32)> **mode** { trap-v1 | trap-v2c | inform-v2c | trap-v3 | inform-v3 }  
[community <community-name(32)>]

Syntax Description	<b>snmp-trap</b>	Configure SNMP trap parameters
	<b>host</b>	Configure the SNMP trap host address
	host-address (32)	The SNMP trap host address
	<b>mode</b>	Configure the SNMP trap mode
	trap-v1	Use trap-v1 mode
	trap-v2c	Use trap-v2c mode
	inform-v2c	Use inform-v2c mode
	trap-v3	Use trap-v3 mode
	inform-v3	Use inform-v3 mode
	community	Configure the community for the SNMP trap host
community-name (32)	The community name for the SNMP trap host	
Defaults	There is no SNMP trap host entry by default	
Command Modes	Global configuration	
Usage Guidelines	A community name must be set when using trap-v1, trap-v2c, or inform-v2c mode. SNMP v3 must be enabled when SNMP trap-v3 mode is enabled. At least one valid user must be set up before setting the SNMP trap host to trap-v3 mode.	
Examples	moxa(config)# snmp-trap host 192.168.127.254 mode trap-v1 community public moxa(config)# snmp-trap host 192.168.127.253 mode inform-v3	

Error Messages	% Can't get snmp-trap host information % Can't get host name from snmp-trap host table % Can't get snmp-trap host table index('%d') % Can't get host-name from snmp-trap host table('%d') % Can't create host entry % Can't modify host entry % must set community name when mode is trap-v1, trap-v2c or infom-v2c % must enable v3 in snmp-server when snmp-trap host <host-address> trap-v3 mode is enable % Atleast setup one valid user before enable snmp-trap host to trap-v3 mode
Related Commands	snmp-trap show snmp-trap

## Delete SNMP Trap Host Entry

### Commands

**no snmp-trap host** <host-address(32)>

Syntax Description	<b>no</b>	Disable the configuration/delete the entry/reset to default value
	<b>snmp-trap</b>	Configure SNMP trap parameters
	host	Configure the SNMP trap host address
	host-address (32)	The SNMP trap host address
Defaults	N/A	
Command Modes	Global configuration	
Usage Guidelines	N/A	
Examples	moxa(config)# no snmp-trap host 192.168.127.254 moxa(config)# no snmp-trap host 192.168.127.253	
Error Messages	% Can't get snmp-trap host information % Can't get host name from snmp-trap host table % Can't get snmp-trap host table index('%d') % Can't get host-name from snmp-trap host table('%d') % Can't delete host entry	
Related Commands	snmp-trap show snmp-trap	

## Configure SNMP Trap Inform Retry Setting

### Commands

**snmp-trap inform-retries** <inform-retries-number(1-99)>

Syntax Description	<b>snmp-trap</b>	Configure SNMP trap parameters
	<b>inform-retries</b>	Configure SNMP trap inform retries
	inform-retries-number (1-99)	The amount of SNMP trap inform retries
Defaults	The default number of SNMP trap inform retries is set to 3	
Command Modes	Global configuration	
Usage Guidelines	N/A	
Examples	moxa(config)# snmp-trap inform-retries 3	
Error Messages	N/A	
Related Commands	snmp-trap show snmp-trap	

## Reset SNMP Trap Inform Retry to Default Value

### Commands

**no snmp-trap inform-retries**

Syntax Description	<b>no</b>	Disable the configuration/delete the entry/reset to default value
	<b>snmp-trap</b>	Configure SNMP trap parameters
	<b>inform-retries</b>	Configure SNMP trap inform retries
Defaults	N/A	
Command Modes	Global configuration	
Usage Guidelines	N/A	
Examples	moxa(config)# no snmp-trap inform-retries	
Error Messages	N/A	
Related Commands	snmp-trap show snmp-trap	

## Configure SNMP Trap Inform Timeout Setting

### Commands

**snmp-trap inform-timeout** <inform-timeout-number(1-300)>

Syntax Description	<b>snmp-trap</b>	Configure SNMP trap parameters
	<b>inform-timeout</b>	Configure the SNMP trap inform timeout
	inform-timeout-number (1-300)	The SNMP trap inform timeout in seconds
Defaults	The default SNMP trap inform timeout is set to 10 seconds	
Command Modes	Global configuration	
Usage Guidelines	N/A	
Examples	moxa(config)# snmp-trap inform-timeout 10	
Error Messages	N/A	
Related Commands	snmp-trap show snmp-trap	

## Reset SNMP Trap Inform Timeout to Default Value

### Commands

**no snmp-trap inform-timeout**

Syntax Description	<b>no</b>	Disable the configuration/delete the entry/reset to default value
	<b>snmp-trap</b>	Configure SNMP trap parameters
	<b>inform-timeout</b>	Configure the SNMP trap inform timeout
Defaults	N/A	
Command Modes	Global configuration	
Usage Guidelines	N/A	
Examples	moxa(config)# no snmp-trap inform-timeout	
Error Messages	N/A	
Related Commands	snmp-trap show snmp-trap	

## Configure SNMP Trap User Account Settings

### Commands

**snmp-trap user** <user-name(32)> **auth-type** { none | md5 | sha } [auth-passwd <authentication-password(64)> ] **encryption** { disable| des | aes } [encryption-key <encryption-key(64)>]

Syntax Description	<b>snmp-trap</b>	Configures SNMP trap parameters
	<b>user</b>	Configure SNMP trap user accounts
	user-name(32)	The user name of the SNMP trap user account
	<b>auth-type</b>	Configure the authentication protocol for the SNMP trap user account
	none	Do not use any authentication protocol
	md5	Use MD5 authentication
	sha	Use SHA authentication
	auth-passwd	Configure the authentication password for the SNMP trap user account
	authentication-password (64)	The authentication password
	<b>encryption</b>	Configure the data encryption protocol for the SNMP trap user account
	disable	Disable data encryption
	des	Use DES data encryption
	aes	Use AES data encryption
	encryption-key	Configure the data encryption key for the SNMP trap user account
encryption-key (64)	The data encryption key	
Defaults	There is no user account table by default	
Command Modes	Global configuration	
Usage Guidelines	If the authentication type is set to none, data encryption should be disabled. If the authentication type is not none, an authentication password must be set up. If data encryption is not disabled, a data encryption key must be set up.	
Examples	<pre>moxa# con t moxa(config)# snmp-trap user test auth-type none encryption disable moxa(config)# snmp-trap user test auth-type md5 auth-passwd 1111111111 encryption disable moxa(config)# snmp-trap user test auth-type md5 auth-passwd 1111111111 encryption des encryption-key 2222222222</pre>	
Error Messages	<pre>% If authentication-type is none, data-encryption method should be disabled % must setup authentication password % must setup data encryption key % Can't get snmp-trap user-account information % Can't get snmp-trap user-account table % Can't get snmp-trap user-account table index ('%d') % Can't get user-name from snmp-trap user-account table('%d') % Can't create user account % Can't modify user account</pre>	
Related Commands	<pre>snmp-trap show snmp-trap</pre>	

## Delete SNMP Trap User Account

### Commands

**no snmp-trap user** <user-name (32)>

Syntax Description	<b>no</b>	Disable the configuration/delete the entry/reset to default value
	<b>snmp-trap</b>	Configures SNMP trap parameters
	<b>user</b>	Configure SNMP trap user accounts
	user-name (32)	The user name of the SNMP trap user account
Defaults	N/A	
Command Modes	Global configuration	
Usage Guidelines	N/A	
Examples	moxa(config)# no snmp-trap user test	
Error Messages	% Can't get snmp-trap user-account information % Can't get snmp-trap user-account table % Can't get snmp-trap user-account table index ('%d') % Can't get user-name from snmp-trap user-account % Can't delete user account	
Related Commands	snmp-trap show snmp-trap	

## Show SNMP Server Information

### Commands

**show snmp-server information**

Syntax Description	<b>show</b>	Display the configuration/statistics/general information
	<b>snmp-server</b>	Display SNMP server information
	<b>information</b>	Display general SNMP server information
Defaults	N/A	
Command Modes	Global configuration	
Usage Guidelines	N/A	
Examples	<pre>moxa# show snmp-server information ----- snmp-server           : enable -----  version               : v1-v2c community read-only   : public community read-write  : private</pre>	
Error Messages	% Can't get snmp-server information % Can't get snmp-server community information	
Related Commands	snmp-server	

## Show SNMP Server User Account Information

### Commands

#### show snmp-server user

Syntax Description	<b>show</b>	Displays the configuration/statistics/general information
	<b>snmp-server</b>	Displays SNMP server information
	<b>user</b>	Displays SNMP server user accounts
Defaults	N/A	
Command Modes	Global configuration	
Usage Guidelines	N/A	
Examples	<pre> moxa# show snmp-server user ----- snmp-server user-account    : 3 ----- user-name                   : testNoAuthNoPriv authority                   : read_write authenticate-type          : none encryption-method          : disable  user-name                   : testAuthNoPriv authority                   : read_write authenticate-type          : md5 encryption-method          : disable  user-name                   : testAuthPriv authority                   : read_write authenticate-type          : md5 encryption-method          : des </pre>	
Error Messages	<pre> % Can't get snmp-server user-account information % Can't get snmp-server user-account table </pre>	
Related Commands	snmp-server	

## Show SNMP Server Engine ID Information

### Commands

#### show snmp-server engine-id

Syntax Description	<b>show</b>	Display the configuration/statistics/general information
	<b>snmp-server</b>	Display SNMP server information
	<b>engine-id</b>	Display the engine ID of the SNMP server
Defaults	N/A	
Command Modes	Global configuration	
Usage Guidelines	N/A	
Examples	<pre> moxa# show snmp-server engine-id snmp-server engineID      : 800021f303000111234567 </pre>	
Error Messages	<pre> % Can't get snmp-server status information % Can't get snmp-server status information jason object </pre>	
Related Commands	snmp-server	



## SNMP Trap/Inform

### Show SNMP Trap Information

#### Commands

##### show snmp-trap information

Syntax Description	<b>show</b>	Display the configuration/statistics/general information
	<b>snmp-trap</b>	Display SNMP trap information
	<b>information</b>	Display general SNMP trap information
Defaults	N/A	
Command Modes	Global configuration	
Usage Guidelines	N/A	
Examples	<pre>moxa# show snmp-trap information ----- snmp-trap                : ----- inform-retry              : 3 inform-timeout            : 10</pre>	
Error Messages	<pre>% Can't get snmp-trap information % Can't get snmp-trap jason object</pre>	
Related Commands	snmp-trap	

### Show SNMP Trap User Account Information

#### Commands

##### show snmp-trap user

Syntax Description	<b>show</b>	Display the configuration/statistics/general information
	<b>snmp-trap</b>	Display SNMP trap information
	<b>user</b>	Display SNMP trap user accounts
Defaults	N/A	
Command Modes	Global configuration	
Usage Guidelines	N/A	
Examples	<pre>moxa# show snmp-trap user ----- snmp-trap user-account    : 1 ----- user-name                 : testNoAuthNoPriv authenticate-type        : none encryption-method        : disable</pre>	
Error Messages	<pre>% Can't get snmp-trap user-account information % Can't get snmp-trap user-account table % Can't get snmp-trap user-account table index ('%d')</pre>	
Related Commands	snmp-trap	

## Show SNMP Trap Host Information

### Commands

#### show snmp-trap host

Syntax Description	<b>show</b>	Display the configuration/statistics/general information
	<b>snmp-trap</b>	Display SNMP trap information
	<b>host</b>	Display SNMP trap host information
Defaults	N/A	
Command Modes	Global configuration	
Usage Guidelines	N/A	
Examples	<pre>moxa# show snmp-trap host ----- snmp-trap host-table      : 2 ----- hostName                  : 192.168.137.254 mode                      : trap-v1 community                 : public  hostName                  : 192.168.127.253 mode                      : inform-v3 community                 :</pre>	
Error Messages	<pre>% Can't get snmp-trap host information % Can't get snmp-trap host table % Can't get snmp-trap host table index('%d')</pre>	
Related Commands	snmp-trap	

# Security

## Device Security

### Management Interface

#### Enable Network Server

##### Commands

**ip** { http | https | telnet | ssh | moxa-command } **server enable**

Syntax Description	<b>ip</b>	Configure IP parameters
	http	Configure HTTP management UI service parameters
	https	Configure HTTPS management UI service parameters
	telnet	Configure Telnet management UI service parameters
	ssh	Configure SSH management UI service parameters
	moxa-command	Configure Moxa Command management UI service parameters
	<b>server</b>	Configure management UI service server parameters
	<b>enable</b>	Enable the management UI service
Defaults	http: enabled https: enabled telnet: enabled ssh: enabled moxa-command: enabled	
Command Modes	Global Configuration	
Usage Guidelines	N/A	
Examples	moxa# configure terminal moxa(config)# ip https server enable	
Error Messages	N/A	
Related Commands	N/A	

## Disable Network Server

### Commands

**ip** { http | https | telnet | ssh | moxa-command } **server disable**

Syntax Description	<b>ip</b>	Configure IP parameters
	http	Configure HTTP management UI service parameters
	https	Configure HTTPS management UI service parameters
	telnet	Configure Telnet management UI service parameters
	ssh	Configure SSH management UI service parameters
	moxa-command	Configure Moxa Command management UI service parameters
	<b>server</b>	Configure management UI service server parameters
	<b>disable</b>	Disable the management UI service
Defaults	http: enabled https: enabled telnet: enabled ssh: enabled moxa-command: enabled	
Command Modes	Global Configuration	
Usage Guidelines	N/A	
Examples	moxa# configure terminal moxa(config)# ip telnet server disable	
Error Messages	N/A	
Related Commands	N/A	

## Configure Network Port Numbers

### Commands

**ip** { http | https | telnet | ssh } **port** <port-number>

Syntax Description	<b>ip</b>	Configure IP parameters
	http	Configure HTTP management UI service parameters
	https	Configure HTTPS management UI service parameters
	telnet	Configure Telnet management UI service parameters
	ssh	Configure SSH management UI service parameters
	<b>port</b>	Configure the service port of the management UI service
	port-number	The service port number
Defaults	http server port: 80 https server port: 443 telnet server port: 23 ssh server port: 22	
Command Modes	Global Configuration	
Usage Guidelines	N/A	
Examples	moxa# configure terminal moxa(config)# ip http port 8080	
Error Messages	Invalid: UI service management port <i>port-number</i> is duplicated.	
Related Commands	N/A	

## Configure SNMP Server Port Number

### Commands

**snmp-server port** <port-number>

Syntax Description	<b>snmp-server</b>	Configure SNMP server parameters
	<b>port</b>	Configure the service port of the SNMP server
	port-number	The service port number
Defaults	The default SNMP server port is set to 161	
Command Modes	Global Configuration	
Usage Guidelines	N/A	
Examples	moxa# configure terminal moxa(config)# snmp-server port 1661	
Error Messages	N/A	
Related Commands	N/A	

## Configure Network Maximum Session Numbers

### Commands

**ip http max-session** <session-number>

Syntax Description	ip	Configure IP parameters
	http	Configure HTTP/HTTPS management UI service parameters
	max-session	Configure the maximum number of concurrent login sessions through HTTP and HTTPS
	session-number	The maximum number of login sessions
Defaults	The maximum number of concurrent HTTP sessions is set to 5 by default	
Command Modes	Global Configuration	
Usage Guidelines	N/A	
Examples	moxa# configure terminal moxa(config)# ip http max-session 3	
Error Messages	N/A	
Related Commands	N/A	

## Configure Network Terminal Maximum Session Numbers

### Commands

**ip terminal max-session** <session-number>

Syntax Description	<b>ip</b>	Configure IP parameters
	<b>terminal</b>	Configure Telnet and SSH terminal parameters
	<b>max-session</b>	Configure the maximum number of concurrent login sessions through Telnet and SSH terminal
	session-number	Maximum number of login sessions
Defaults	max terminal session: 1	
Command Modes	Global Configuration	
Usage Guidelines	N/A	
Examples	moxa# configure terminal moxa(config)# ip terminal max-session 3	
Error Messages	N/A	
Related Commands	N/A	

## Show Network Service Information

### Commands

#### show ip service information

Syntax Description	<b>show</b>	Display configuration/status information
	<b>ip</b>	Display IP information
	<b>service</b>	Display management UI service information
	<b>information</b>	Display the information for management UI services
Defaults	N/A	
Command Modes	User EXEC Privileged EXEC	
Usage Guidelines	N/A	
Examples	<pre>moxa# show ip service information HTTP service: Enabled HTTP port: 80 HTTPS service: Enabled HTTPS port: 443 Telnet service: Enabled Telnet port: 23 SSH service: Enabled SSH port: 22 SNMP service: Enabled SNMP port: 161 MOXA service: Enabled HTTP/HTTPS Maximum Login Sessions: 5 Telnet/SSH Maximum Login Sessions: 1</pre>	
Error Messages	N/A	
Related Commands	N/A	

## Login Policy

### Configure Login Lockout Settings

#### Commands

**login lockout** <enable|disable>

**login lockout** <minute(1-10)> **attempts** <tries(1-10)>

Syntax Description	<b>login</b>	Configure login parameters
	<b>lockout</b>	Configure the maximum number of failed login attempts and the lockout time to block the user from logging in
	enable	Enable login lockout
	disable	Disable login lockout
	minute	Configure the lockout time ranging from 1 to 10 minutes
	<b>attempts</b>	Configure the maximum number of login attempts
	tries	The number of tries ranging from 1 to 10
Defaults	N/A	
Command Modes	Global configuration	
Usage Guidelines	N/A	
Examples	<pre>(config)# login lockout 10 attempts 5 (config)# login lockout enable (config)# login lockout disable</pre>	
Error messages	N/A	
Related commands	N/A	

## Configure Login Banner

### Commands

**login banner** <string (500)>

**no login banner**

Syntax Description	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>login</b>	Configure login parameters
	<b>banner</b>	Configure a login banner
	string	The login banner content up to 500 characters
Defaults	N/A	
Command Modes	Global configuration	
Usage Guidelines	N/A	
Examples	(config)# login banner "this is a banner" (config)# no login banner	
Error messages	N/A	
Related commands	N/A	

## Configure Login Failure Message

### Commands

**login fail-message** <string (500)>

**no login fail-message**

Syntax Description	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>login</b>	Configure login parameters
	<b>fail-message</b>	Configure a login failure message
	string	The login failure message up to 500 characters
Defaults	N/A	
Command Modes	Global configuration	
Usage Guidelines	N/A	
Examples	(config)# login fail-message "this is a failure message" (config)# no login fail-message	
Error messages	N/A	
Related commands	N/A	

## Configure Timeout Value for a Session End

### Commands

**session timeout** <integer (1-1440)>

Syntax Description	<b>session</b>	Configure session parameters
	<b>timeout</b>	Configure the session timeout value
	integer	The timeout value ranging from 1 to 1440 seconds
Defaults	N/A	
Command Modes	Global configuration	
Usage Guidelines	N/A	
Examples	(config)# session timeout 100	
Error messages	N/A	
Related commands	N/A	

## Show Session Timeout Information

### Commands

#### show session timeout

Syntax	<b>show</b>	Display running information
Description	<b>session</b>	Display session information
	<b>timeout</b>	Display session timeout information
Defaults	N/A	
Command Modes	Global configuration	
Usage Guidelines	N/A	
Examples	moxa# show session timeout Session TimeOut: 5 (Min)	
Error messages	N/A	
Related commands	N/A	

## Show Login Failure Message

### Commands

#### show login fail-message

Syntax Description	<b>show</b>	Display running information
	<b>login</b>	Display login information
	<b>fail-message</b>	Display the login failure message
Defaults	N/A	
Command Modes	Global configuration	
Usage Guidelines	N/A	
Examples	moxa# show log fail-message Login Fail Message: This is a failed message!	
Error messages	N/A	
Related commands	N/A	

## Show Login Banner

### Commands

#### show login banner

Syntax Description	<b>show</b>	Display running information
	<b>login</b>	Display login information
	<b>banner</b>	Display the login banner
Defaults	N/A	
Command Modes	Global configuration	
Usage Guidelines	N/A	
Examples	moxa# show log banner Login Banner Message: this is a banner	
Error messages	N/A	
Related commands	N/A	



## Show Login Authentication

### Commands

#### show login authentication

Syntax Description	<b>show</b>	Display running information
	<b>login</b>	Display login information
	<b>authentication</b>	Display authentication information
Defaults	N/A	
Command Modes	Global configuration	
Usage Guidelines	N/A	
Examples	moxa# show login authentication Login Authentication Method: Local	
Error messages	N/A	
Related commands	N/A	

## Trusted Access

### Configure Trusted Access Settings

#### Commands

**trusted-access ip-source** <ucast\_addr> [ { <ip\_mask> | "/" <short(0-32)> } ]

**no trusted-access** <ucast\_addr> [ { <ip\_mask> | "/" <short(0-32)> } ]

Syntax Description	<b>no</b>	Disable the configuration/delete the entry/reset to default value
	<b>trusted-access</b>	Configure IP trusted access parameters
	<b>ip-source</b>	Configure the IP source
	ucast_addr	Configure the network or host IP address
	ip_mask	Configure the subnet mask of the IP address
	"/"	Configure the CIDR notation
	short (0-32)	Configure the prefix length
Defaults	Trusted access is disabled by default	
Command Modes	Privileged EXEC Global Configuration	
Usage Guidelines	Trusted access will take effect when the " <i>trusted-access enable</i> " command is executed.	
Examples	(config)# trusted-access ip-source 10.10.10.10 255.255.255.0 (config)# trusted-access ip-source 20.10.10.10 / 24 (config)# trusted-access ip-source 30.10.10.10 (config)# no trusted-access ip-source 10.10.10.10 255.255.255.0 (config)# no trusted-access ip-source 20.10.10.10 / 24 (config)# no trusted-access ip-source 30.10.10.10	
Error Messages	N/A	
Related Commands	show trusted-access trusted-access enable	

## Enable/Disable IP Trusted Access List

### Commands

**trusted-access** <enable>

**trusted-access** <disable>

Syntax Description	<b>trusted-access</b>	Configure IP trusted access parameters
	enable	Enable the IP trusted access list
	disable	Disable the IP trusted access list
Defaults	N/A	
Command Modes	Privileged EXEC Global Configuration	
Usage Guidelines	N/A	
Examples	(config)# trusted-access enable (config)# trusted-access disable	
Error messages	N/A	
Related commands	trusted-access disable	

## Show Trusted Access IP List

### Commands

**show trusted-access**

Syntax Description	<b>show</b>	Display configuration/status information
	<b>trusted-access</b>	Display IP trusted access information
Defaults	N/A	
Command Modes	User EXEC Privileged EXEC	
Usage Guidelines	N/A	
Examples	moxa# show trusted-access Trusted Access Table : Disabled ----- IP Address : 210.222.222.225 Subnet Mask : 255.255.255.0 moxa#	
Error Messages	% No such manager found % Manager is not configured	
Related Commands	trusted-access	

## SSH & SSL

### Re-generate New Web SSL Certificate

#### Commands

##### web certificate generate

Syntax Description	<b>web</b>	Configure web parameters
	<b>certificate</b>	Configure the web server certificate
	<b>generate</b>	Generate a self-signed certificate
Defaults	N/A	
Command Modes	Global configuration	
Usage Guidelines	N/A	
Examples	(config)# web certificate generate	
Error messages	N/A	
Related commands	N/A	

### Import New Web SSL Certificate via TFTP or SFTP

#### Commands

##### web certificate import {<tftp\_url> | <sftp\_url>}

Syntax Description	<b>web</b>	Configure web parameters
	<b>certificate</b>	Configure the web server certificate
	<b>import</b>	Import the certificate from a remote server
	tftp_url	The file on the remote TFTP server to be copied
	sftp_url	The file on the remote SFTP server to be copied
Defaults	N/A	
Command Modes	Global configuration	
Usage Guidelines	N/A	
Examples	(config)# web certificate import tftp://192.168.1.1/server.crt	
Error messages	Format or Password Error Server not Connected	
Related commands	N/A	

### Export Web SSL Certificate Signing Request via TFTP/SFTP

#### Commands

##### web signing-request export {<tftp\_url> | <sftp\_url>}

Syntax Description	<b>web</b>	Configure Web related parameters
	<b>signing-request</b>	Configure the web server certificate signing request
	<b>export</b>	Export the certificate
	tftp_url	The file on the remote TFTP server to be copied
	sftp_url	The file on the remote SFTP server to be copied
Defaults	N/A	
Command Modes	Global configuration	
Usage Guidelines	N/A	
Examples	(config)# web signing-request export tftp://192.168.1.1/server.csr	
Error Messages	Server not Connected	
Related Commands	N/A	

## Re-generate New SSH Key

### Commands

#### ssh key generate

Syntax Description	<b>ssh</b>	Configure SSH parameters
	<b>key</b>	Configure the SSH server key
	<b>generate</b>	Generate the SSH key
Defaults	N/A	
Command Modes	Global configuration	
Usage Guidelines	N/A	
Examples	(config)# ssh key generate	
Error messages	N/A	
Related commands	N/A	

## Network Security

### IEEE802.1X

#### Configure Local Authentication Mode

### Commands

#### dot1x aaa auth { radius | local }

Syntax Description	<b>dot1x</b>	Configure IEEE 802.1X port-based network access control
	<b>aaa</b>	Configure authentication, authorization, and accounting
	<b>auth</b>	Configure authentication
	radius	Configure a RADIUS authentication server
	local	Configure a local authentication database
Defaults	The default authentication mode is set to local	
Command Modes	Global configuration mode	
Usage Guidelines	This command enables dot1x local authentication or RADIUS server-based remote authentication method for all ports. The actual authentication of the supplicant happens at the authentication server.	
Examples	moxa(config)# dot1x aaa auth radius	
Error Messages	N/A	
Related Commands	N/A	

## Enable/Disable IEEE802.1X Function

### Commands

**dot1x** { enable | disable }

Syntax Description	<b>dot1x</b>	Configure IEEE 802.1X port-based network access control
	enable	Enable dot1x authentication
	disable	Disable dot1x authentication
Defaults	Dot1x authentication is disabled by default	
Command Modes	Global configuration mode	
Usage Guidelines	This command enables dot1x on the switch. Dot1x is an authentication mechanism that acts as mediator between the authentication server and the supplicant (client). If the client accesses the protected resources, it contacts the authenticator with EAPOL frames.	
Examples	moxa (config)# dot1x enable	
Error Messages	<p>{{!s}} and 802.1x/MAB cannot be enabled at the same port.</p> <p>Invalid: If 802.1x port is enabled, the port security port cannot be enabled.</p> <p>Invalid: If the port is in port-channel, it cannot enable dot1x.</p>	
Related Commands	N/A	

## Configure IEEE802.1X on the Port

### Commands

**dot1x**

**no dot1x**

Syntax Description	<b>dot1x</b>	Enable dot1x on the port.
	<b>no dot1x</b>	Disable dot1x on the port.
Defaults	Dot1x is disabled by default	
Command Modes	Interface Configuration Mode	
Usage Guidelines	This command enables dot1x on the specified port.	
Examples	<p>moxa (config-if)# dot1x</p> <p>moxa (config-if-range)# dot1x</p>	
Error Messages	<p>{{!s}} and 802.1x/MAB cannot be enabled at the same port.</p> <p>Invalid: If 802.1x port is enabled, the port security port cannot be enabled.</p> <p>Invalid: If the port is in port-channel, it cannot enable dot1x.</p>	
Related Commands	N/A	

## Authorize IEEE802.1X

### Commands

**dot1x port-control** { auto | force-authorized | force-unauthorized }

**no dot1x port-control**

Syntax Description	<b>dot1x</b>	Configure IEEE 802.1X port-based network access control
	<b>port-control</b>	Configure authenticator port control parameters
	auto	Enable 802.1X authentication on the interface
	force-authorized	Allow all traffic without any restrictions
	force-unauthorized	Block all traffic over the interface
	<b>no</b>	Set the authenticator port control state to force-authorized.
Defaults	The default port-control mode is set to force-authorized	
Command Modes	Interface Configuration Mode	
Usage Guidelines	This command configures the authenticator port control parameter. The dot1x standard exercises port-based authentication to increase the security of the network. The different modes employed on the ports offer varied access levels.	
Examples	moxa (config-if)# dot1x port-control auto moxa (config-if-range)# dot1x port-control auto	
Error Messages	N/A	
Related Commands	N/A	

## Configure Maximum Number of EAP

### Commands

**dot1x max-req** < count (1-10) >

**no dot1x max-req**

Syntax Description	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>dot1x max-req</b>	Configure the dot1X maximum request count
	count	The count value ranging from 1 to 10.
	<b>no</b>	Set the maximum number of EAP retries to the client to the default value
Defaults	The default request count is set to 2	
Command Modes	Interface Configuration Mode	
Usage Guidelines	This command sets the maximum number of EAP (Extensible Authentication Protocol) retries to the client by the authenticator before restarting the authentication process.	
Examples	moxa (config-if)# dot1x max-req 2 moxa (config-if-range)# dot1x max-req 2	
Error Messages	Invalid input detected at '^' marker	
Related Commands	N/A	

## Configure IEEE802.1X Reauthentication

### Commands

**dot1x reauthentication**

**no dot1x reauthentication**

Syntax Description	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>dot1x</b>	Configure IEEE 802.1X port-based network access control
	<b>reauthentication</b>	Perform periodic reauthentication
Defaults	Dot1x reauthentication is disabled by default	
Command Modes	Interface Configuration Mode.	
Usage Guidelines	This command enables periodic re-authentication from authenticator to client. The periodic re-authentication is requested to ensure that the same supplicant is accessing the protected resources.	
Examples	moxa (config-if)# dot1x reauthentication moxa (config-if-range)# dot1x reauthentication	
Error Messages	Invalid: If port Control mode is not Auto, Reauthentication cannot be enabled.	
Related Commands	dot1x timeout – Sets the dot1x timers dot1x port-control – Configures the authenticator port control parameter	

## Reauthenticate IEEE802.1X on the Port

### Commands

**dot1x re-authenticate**

Syntax Description	<b>dotx1</b>	Configure IEEE 802.1X port-based network access control
	<b>re-authenticate</b>	Perform re-authentication of the specified dot1x-enabled port
Defaults	N/A	
Command Modes	Privileged EXEC Mode	
Usage Guidelines	Re-authentication is requested by the authentication server to the supplicant to furnish the identity without waiting for the configured number of seconds. (re-authperiod).	
Examples	moxa (config-if) # dot1x re-authenticate moxa (config-if-range) # dot1x re-authenticate	
Error Messages	N/A	
Related Commands	N/A	

## Configure IEEE802.1X Settings

### Commands

**dot1x timeout** { quiet-period < value (0-65535) > | { reauth-period | server-timeout | supp-timeout | tx-period } < value (1-65535) > }

**no dot1x timeout** { quiet-period | reauth-period | server-timeout | supp-timeout | tx-period }

Syntax Description	<b>dot1x</b>	Configure IEEE 802.1X port-based network access control
	<b>timeout</b>	Configure the dot1x timeout parameter
	quiet-period	The number of seconds that the switch remains in the quiet state following a failed authentication exchange with the client
	reauth-period	The number of seconds between re-authentication attempts
	server-timeout	The number of seconds that the switch waits for the retransmission of packets by the switch to the authentication server
	supp-timeout	The number of seconds that the switch waits for the retransmission of packets by the switch to the client
	tx-period	The number of seconds that the switch waits for a response to an EAP-request/identity frame from the client before retransmitting the request
	<b>no</b>	Set the dot1x timers to their default values
Defaults	quiet-period: 60 seconds reauth-period: 3600 seconds server-timeout: 30 seconds supp-timeout: 30 seconds tx-period: 30 seconds	
Command Modes	Interface configuration mode	
Usage Guidelines	This command sets the dot1x timers.	
Examples	moxa (config-if)# dot1x timeout quiet-period 30 moxa (config-if-range)# dot1x timeout quiet-period 30	
Error Messages	Invalid input detected at '^' marker	
Related Commands	dot1x max-req – Sets the maximum number of EAP retries to the client before restarting authentication process. dot1x reauthentication – Enables periodic re-authentication of the client.	



## Show IEEE802.1X Information

### Commands

**show dot1x** [ { interface < interface-type > < interface-id > | local-database | all } ]

Syntax Description	<b>show</b>	Display configuration/statistics/general information
	<b>dot1x</b>	Configure IEEE 802.1X port-based network access control
	interface-type	The interface type
	interface-id	The slot number/port number
	local-database	Display the dot1x authentication server database with user names
	all	Display the dot1x status for all interfaces
Defaults	N/A	
Command Modes	Privileged EXEC Mode	
Usage Guidelines	This command displays dot1x information.	
Examples	<pre> moxa # show dot1x iss# show dot1x Sysauthcontrol                = Enabled Dot1x Authentication Method    = Local  moxa # show dot1x interface gigabitethernet 1/2 Dot1x Info for Eth1/2 ----- AuthPaeStatus                 = ENABLED PortStatus                    = UNAUTHORIZED MaxReq                        = 2 Port Control                   = Auto QuietPeriod                   = 60 Seconds Re-authentication             = Disabled ReAuthPeriod                  = 3600 Seconds ServerTimeout                 = 30 Seconds SuppTimeout                   = 30 Seconds Tx Period                     = 30 Seconds  moxa # show dot1x local-database Pnac Authentication Users Database ----- User name      : user1 Ports         : Eth1/1, Eth1/2, Eth1/3, Eth1/4, Eth2/1, Eth2/2                Eth2/3, Eth2/4, Eth3/1, Eth3/2, Eth3/3, Eth3/4                Eth4/1, Eth4/2, Eth4/3, Eth4/4, Eth5/1, Eth5/2                Eth5/3, Eth5/4, Eth6/1, Eth6/2, Eth6/3, Eth6/4                Eth7/1, Eth7/2, Eth7/3, Eth7/4 ----- User name      : user2 Ports         : Eth1/1, Eth1/2, Eth1/3, Eth1/4, Eth2/1, Eth2/2                Eth2/3, Eth2/4, Eth3/1, Eth3/2, Eth3/3, Eth3/4                Eth4/1, Eth4/2, Eth4/3, Eth4/4, Eth5/1, Eth5/2                Eth5/3, Eth5/4, Eth6/1, Eth6/2, Eth6/3, Eth6/4                Eth7/1, Eth7/2, Eth7/3, Eth7/4 ----- </pre>	
Error Messages	N/A	
Related Commands	dot1x local-database - Configures dot1x local database with values dot1x system-auth-control - Enables dot1x in the switch dot1x max-req - Configures the maximum number of EAP retries to the client dot1x reauthentication - Configures the periodic reauthentication for the client dot1x timeout - Sets the dot1x timers	

## Configure IEEE802.1X Server Host

### Commands

**dot1x auth radius-server host** { ipv4-address } [ auth-port < integer(1-65535) > ] [ timeout < 1-120 > ] [ retransmit < 1-254 > ] [ key < secret-key-string > ] [ primary ]

**no dot1x auth radius-server host** { < ipv4-address > } [ primary ]

Syntax Description	<b>dot1</b>	Configure IEEE 802.1X port-based network access control
	<b>auth radius-server host</b>	Configure the RADIUS server host
	ipv4-address	Configure the IPv4 address.
	auth-port	Configure a specific UDP destination port on this RADIUS server to be used exclusively for authentication requests.
	timeout	Configure the time period in seconds for which a client waits for a response from the server before re-transmitting the request.
	retransmit	Configure the maximum number of attempts to be tried by a client to get a response from the server for a request.
	key	Configure the per-server encryption key.
	primary	Set the RADIUS server as the primary server.
	<b>no</b>	Delete the RADIUS server configuration
Defaults	N/A	
Command Modes	Global configuration mode	
Usage Guidelines	This command configures the RADIUS client with the host, timeout, key, retransmit parameters.	
Examples	moxa (config)# dot1x auth radius-server host 6.7.8.9 auth-port 1812 timeout 3 retransmit 1 key 123456 primary	
Error Messages	Invalid: All of the retry times {{!s}} cannot exceeds Dot1x server timeout values {{!s}}. Note: All of the retry times = Timeout * (Retransmit + 1). Invalid: Primary IP Address should be the same as the Server IP Address. Invalid: Server IP Address cannot be a reserved IP Address.	
Related Commands	N/A	

## Configure IEEE802.1X Username and Password

### Commands

**dot1x local-database** < username > password < password >

**no dot1x local-database** < username >

Syntax Description	<b>dot1x</b>	Configure IEEE 802.1X port-based network access control
	<b>local-database</b>	Configure the local database table
	username	Configure the username for the new entry
	password	Configure the password for the new entry
	<b>no</b>	Delete the entry from the dot1x authentication server database
Defaults	N/A	
Command Modes	Global configuration mode	
Usage Guidelines	This command configures dot1x authentication server local database username and password entries.	
Examples	moxa (config)# dot1x local-database user password 123456	
Error Messages	Invalid: This 'Username' is already in the 'Local Database'.	
Related Commands	N/A	

## Show IEEE802.1X Authentication RADIUS Server

### Commands

#### show dot1x auth radius server

Syntax Description	<b>show</b>	Display configuration/statistics/general information
	<b>dot1x</b>	Display dot1x configuration information
	<b>auth</b>	Display authentication type information.
	<b>radius</b>	Display RADIUS server information.
	<b>server</b>	Display server information.
Defaults	N/A	
Command Modes	Privileged EXEC Mode	
Usage Guidelines	This command displays radius server information.	
Examples	<pre> moxa# show dot1x auth radius server Primary Server          : 6.7.8.9  Radius Server Host Information ----- Index                  : 1 Server address         : 6.7.8.9 Shared secret          : Radius Server Status   : Enabled Response Time          : 5 Maximum Retransmission : 1 Authentication Port    : 1812 ----- </pre>	
Error Messages	N/A	
Related Commands	N/A	

## Port Security

### Configure Port Security Mode

#### Commands

**port-security mode** { static-port-lock | mac-sticky }

Syntax Description	<b>port-security</b>	Configure port security parameters
	<b>mode</b>	Configure the security mode (port security port/address table will be reset when the mode changes)
	static-port-lock	Use Static Port Lock mode
	mac-sticky	Use MAC Sticky mode
Defaults	The default port security mode is set to static-port-lock	
Command Modes	Privileged EXEC Global Configuration	
Usage Guidelines	Changing modes resets all port configurations.	
Examples	moxa(config)# port-security mode mac-sticky moxa(config)# port-security mode static-port-lock	
Error Messages	"error:If 'portLimit' is changed, 'mode' must be Mac Sticky" "error:If 'portSecurityAction' is changed," + " 'mode' must be Mac sticky" 'Invalid: Address Table cannot have duplicated addresses (VLAN ID, MAC Address).' 'Invalid: The mac address has exceeded the setting port limit.' 'Sum of port limit value on all ports ' + 'MUST under ' + str(_MAX_SUM_OF_PORT_LIMIT) + ' in Mac-Sticky mode' 'Invalid: Port Security MAC only support unicast address.' 'Invalid: Port Security address table VLAN ID must exist in the VLAN configuration.' 'Invalid: Port Security address table port should be added in the VLAN member.' 'Invalid: Port Security address table conflicts with VLAN configuration.' 'Invalid: If this port enables Port Security, this port cannot be a member port of Static Unicast Port Table.' 'Invalid: If this port enables Port Security, this port cannot be a member port of port-channel.' 'Invalid: If Port Security is enabled on this port, it cannot be a destination port of port mirror.' 'Invalid: If Port Security action is changed, this port could not in violation state.' 'Invalid: Port Security and redundant protocol cannot be enabled on the same port.'	
Related Commands	N/A	

## Enable/Disable Port Security

### Commands

**port-security** { enable | disable }

Syntax Description	<b>port-security</b>	Configure port security parameters
	enable	Enable port security
	disable	Disable port security
Defaults	Port security is enabled by default	
Command Modes	Privileged EXEC Global Configuration	
Usage Guidelines	N/A	
Examples	moxa(config)# port-security enable moxa(config)# port-security disable	
Error Messages	<p>'error:If 'portLimit' is changed, 'mode' must be Mac Sticky"</p> <p>'error:If 'portSecurityAction' is changed," + " 'mode' must be Mac sticky"</p> <p>'Invalid: Address Table cannot have duplicated addresses (VLAN ID, MAC Address).'</p> <p>'Invalid: The mac address has exceeded the setting port limit.'</p> <p>'Sum of port limit value on all ports ' + 'MUST under ' + str(_MAX_SUM_OF_PORT_LIMIT) + ' in Mac-Sticky mode'</p> <p>'Invalid: Port Security MAC only support unicast address.'</p> <p>'Invalid: Port Security address table VLAN ID must exist in the VLAN configuration.'</p> <p>'Invalid: Port Security address table port should be added in the VLAN member.'</p> <p>'Invalid: Port Security address table conflicts with VLAN configuration.'</p> <p>'Invalid: If this port enables Port Security, this port cannot be a member port of Static Unicast Port Table.'</p> <p>'Invalid: If this port enables Port Security, this port cannot be a member port of port-channel.'</p> <p>'Invalid: If Port Security is enabled on this port, it cannot be a destination port of port mirror.'</p> <p>'Invalid: If Port Security action is changed, this port could not in violation state.'</p> <p>'Invalid: Port Security and redundant protocol cannot be enabled on the same port.'</p>	
Related Commands	N/A	

## Configure Port Security Setting

### Commands

**port-security** [ { limit <integer(1-1024)> | violation { packet-drop | port-shutdown } | mac-address <ucast\_mac> vlan <vlan\_vfi\_id> } ]

Syntax Description	<b>port-security</b>	Configure port security parameters
	limit	The maximum number of addresses on the port
	integer (1-1024)	The limit value (MAC address will be removed on the configured port when the limit value changes)
	violation	Configure the violation action on the port
	packet-drop	Drop the packet when a violation occurs
	port-shutdown	Shut down the port when a violation occurs
	mac-address	The new MAC address
	ucast_mac	The unicast MAC address
	vlan	The new VLAN ID
vlan_vfi_id	The VLAN ID ranging from 1 to 4094	
Defaults	no port-security: disable on ports limit: 1 violation: secure action is packet-drop	
Command Modes	Privileged EXEC Interface Configuration	
Usage Guidelines	If the limit value changes on a port, all entries on the port are deleted.	
Examples	moxa(config-if)# port-security moxa(config-if)# port-security limit 10 moxa(config-if)# port-security violation port-shutdown moxa(config-if)# port-security mac-address 02:03:04:01:01:01 vlan 1	
Error Messages	"error:If 'portLimit' is changed, 'mode' must be Mac Sticky" "error:If 'portSecurityAction' is changed," + " 'mode' must be Mac sticky" 'Invalid: Address Table cannot have duplicated addresses (VLAN ID, MAC Address).' 'Invalid: The mac address has exceeded the setting port limit.' 'Sum of port limit value on all ports ' + 'MUST under ' + str(_MAX_SUN_OF_PORT_LIMIT) + ' in Mac-Sticky mode' 'Invalid: Port Security MAC only support unicast address.' 'Invalid: Port Security address table VLAN ID must exist in the VLAN configuration.' 'Invalid: Port Security address table port should be added in the VLAN member.' 'Invalid: Port Security address table conflicts with VLAN configuration.' 'Invalid: If this port enables Port Security, this port cannot be a member port of Static Unicast Port Table.' 'Invalid: If this port enables Port Security, this port cannot be a member port of port-channel.' 'Invalid: If Port Security is enabled on this port, it cannot be a destination port of port mirror.' 'Invalid: If Port Security action is changed, this port could not in violation state.' 'Invalid: Port Security and {} '.format(red_protocol_def[red_protocol]) + 'cannot be enabled on the same port.'	
Related Commands	N/A	

## Remove Port Security Setting

### Commands

**no port-security** [ { limit | mac-address { <mac\_addr> vlan <integer(1-4094)> | all } } ]

Syntax Description	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>port-security</b>	Configure port security parameters
	limit	The maximum number of addresses on the port
	mac-address	The new MAC address
	mac_addr	The MAC address
	vlan	The new VLAN ID
	integer (1-4094)	The VLAN ID ranging from 1 to 4094
	all	All entries in the address table
Defaults	N/A	
Command Modes	Privileged EXEC Interface Configuration	
Usage Guidelines	If the limit value changes on a port, all entries on the port are deleted.	
Examples	moxa(config-if)# no port-security moxa(config-if)# no port-security limit moxa(config-if)# no port-security mac-address 02:03:04:01:01:01 vlan 1	
Error Messages	"error:If 'portLimit' is changed, 'mode' must be Mac Sticky" "error:If 'portSecurityAction' is changed," + " 'mode' must be Mac sticky" 'Invalid: Address Table cannot have duplicated addresses (VLAN ID, MAC Address).' 'Invalid: The mac address has exceeded the setting port limit.' 'Sum of port limit value on all ports ' + 'MUST under ' + str(_MAX_SUM_OF_PORT_LIMIT) + ' in Mac-Sticky mode' 'Invalid: Port Security MAC only support unicast address.' 'Invalid: Port Security address table VLAN ID must exist in the VLAN configuration.' 'Invalid: Port Security address table port should be added in the VLAN member.' 'Invalid: Port Security address table conflicts with VLAN configuration.' 'Invalid: If this port enables Port Security, this port cannot be a member port of Static Unicast Port Table.' 'Invalid: If this port enables Port Security, this port cannot be a member port of port-channel.' 'Invalid: If Port Security is enabled on this port, it cannot be a destination port of port mirror.' 'Invalid: If Port Security action is changed, this port could not in violation state.' 'Invalid: Port Security and redundant protocol cannot be enabled on the same port.'	
Related Commands	set port-security mode [static-port-lock   mac-sticky]	

## Show Port Security Setting

### Commands

**show port-security** [ address ]

Syntax Description	<b>show</b>	Display configuration/statistics/general information
	<b>port-security</b>	Display port security information
	address	Display port security address information
Defaults	N/A	
Command Modes	User EXEC Privileged EXEC	
Usage Guidelines	N/A	
Examples	moxa# show port-security moxa# show port-security address	
Error Messages	N/A	
Related Commands	N/A	

## Traffic Storm Control

### Enable/Disable Storm Control

#### Commands

**storm-control** { bc | mc | dlf | bc\_mc | bc\_dlf | mc\_dlf | bc\_mc\_dlf } level <rate-value(1-1488100)>

**no storm-control** {bc | mc | dlf | bc\_mc | bc\_dlf | mc\_dlf | bc\_mc\_dlf}

Syntax Description	<b>no</b>	Remove configuration delete entry/reset to default value
	<b>storm-control</b>	Configure storm control parameters
	bc	Configure broadcast packet storm control parameters
	mc	Configure multicast packet storm control parameters
	dlf	Configure unicast packet storm control parameters
	bc_mc	Configure broadcast and multicast packet storm control parameters
	bc_dlf	Configure broadcast and unicast packet storm control parameters
	mc_dlf	Configure multicast and unicast packet storm control parameters
	bc_mc_dlf	Configure broadcast multicast and unicast packet storm control parameters
	level	Configure the control suppression level
	rate-value (625-1488100)	The storm control rate value
Defaults	N/A	
Command Modes	Privileged EXEC Global Configuration	
Usage Guidelines	N/A	
Examples	<pre>moxa# configure moxa(config)# interface ethernet 1/1 moxa(config-if)# storm-control bc level 635  moxa# configure moxa(config)# interface ethernet 1/1 moxa(config-if)# storm-control bc_mc level 1270  moxa# configure moxa(config)# interface ethernet 1/1 moxa(config-if)# storm-control bc_mc_dlf level 1905  moxa# configure moxa(config)# interface ethernet 1/1 moxa(config-if)# no storm-control bc</pre>	
Error Messages	<p>'Invalid: The value of traffic storm control should be less than ingress rate limit threshold.'</p> <p>'Invalid: Your configure value {}.format(cfg_val) + ' exists too large bias because of limitation of hardware.' + ' We suggest configure the value {} again.'.format(suggest_cfg_val)</p>	
Related Commands	<pre>moxa(config-if)# no storm-control {bc   mc   dlf   bc_mc   bc_dlf   mc_dlf   bc_mc_dlf} moxa# show [&lt;ifXtype&gt; &lt;ifnum&gt;] storm-control</pre>	



## Show Storm Control Status

### Commands

**show interfaces** [<ifXtype> <ifnum>] **storm-control**

Syntax Description	<b>show</b>	Display configuration/status information
	<b>interface</b>	Display interface information
	ifXtype	The interface type
	ifnum	The interface number
	<b>storm-control</b>	Display the broadcast, multicast, and unicast storm control suppression levels of the interface
Defaults	N/A	
Command Modes	Privileged EXEC Global Configuration	
Usage Guidelines	N/A	
Examples	<pre>moxa# show interface ethernet 1/1 storm-control  Eth1/1 DLF Storm Control           : Disabled Broadcast Storm Control    : Disabled Multicast Storm Control     : Disabled  moxa# show interface ethernet 1/1 storm-control  Eth1/1 DLF Storm Control           : Disabled Broadcast Storm Control    : Enabled Broadcast Storm Control Level : 635  Multicast Storm Control     : Disabled</pre>	
Error Messages	N/A	
Related Commands	<pre>moxa (config-if)# storm-control {bc   mc   dlf   bc_mc   bc_dlf   mc_dlf   bc_mc_dlf} level &lt;rate-value(625-1488100)&gt; moxa (config-if)# no storm-control {bc   mc   dlf   bc_mc   bc_dlf   mc_dlf   bc_mc_dlf}</pre>	

## Authentication

### Login Authentication

#### Configure Login Authentication Settings

##### Commands

**login authentication** [{ radius | tacacs }] [local]

Syntax Description	<b>login</b>	Configure login parameters
	<b>authentication</b>	Configure authentication parameters
	radius	Configure RADIUS authentication servers
	tacacs	Configure a TACACS authentication system
	local	Configure a local authentication database
Defaults	N/A	
Command Modes	Global configuration	
Usage Guidelines	N/A	
Examples	(config)# login authentication radius (config)# login authentication tacacs (config)# login authentication local (config)# login authentication radius local (config)# login authentication tacacs local	
Error messages	N/A	
Related commands	N/A	

## RADIUS

#### Configure RADIUS Server Host Settings

##### Commands

**radius-server host** { <ucast\_addr> } [auth-port {<integer(1-65535)>}] [timeout {<short(5-180)>}] [retransmit {<short(0-5)>}] key {<string(60)>} authtype { pap | chap | mschap } { primary | secondary }

**no radius-server** { primary | secondary }

Syntax Description	<b>no</b>	Disable the configuration/delete the entry/reset to default value
	<b>radius-server</b>	Configure RADIUS server parameters
	host	Configure the RADIUS host
	auth-port	Configures the UDP destination port for authentication requests
	timeout	Configure time period (in seconds) until which a client waits for a response from the server before re-transmitting the request
	retransmit	Configure the maximum number of attempts the client undertakes to contact the server
	key	Configure the RADIUS server encryption key
	authtype	Configure the authentication type of the RADIUS server
	primary	Set as the primary server
	secondary	Set as the secondary server
Defaults	N/A	
Command Modes	Global configuration	
Usage Guidelines	N/A	
Examples	(config)# radius-server host 1.1.1.1 auth-port 2222 timeout 5 retransmit 5 key test authtype pap primary (config)# no radius-server primary	
Error Messages	N/A	

Related Commands	N/A
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## Show RADIUS Server Information

### Commands

#### show radius-server

Syntax Description	<b>show</b>	Display running information
	<b>radius- server</b>	Display the RADIUS server parameters
Defaults	N/A	
Command Modes	Privileged EXEC / User EXEC	
Usage Guidelines	N/A	
Examples	moxa# show radius-server	
Error messages	N/A	
Related commands	N/A	

## TACACS+

### Configure TACACS+ Server Host Settings

#### Commands

**tacacs-server host** { <ucast\_addr> } [auth-port {<integer(1-65535)>}] [timeout {<short(5-180)>}] [retransmit {<short(0-5)>}] key {<string(60)>} authtype { pap | chap | mschap } { primary | secondary }

**no tacacs-server** { primary | secondary }

Syntax Description	<b>no</b>	Disable the configuration/delete the entry/reset to default value
	<b>tacacs -server</b>	Configure TACACS server parameters
	<b>host</b>	Configure TACACS host parameters
	auth-port	Configure authentication port parameters
	timeout	Configure timeout parameters
	retransmit	Configure the maximum number of attempts the client undertakes to contact the server
	key	Configure the per-server encryption key
	authtype	Configure the authentication type of the TACACS server
	primary	Set as the primary server
	secondary	Set as the secondary server
Defaults	N/A	
Command Modes	Global configuration	
Usage Guidelines	N/A	
Examples	(config)# tacacs-server host 1.1.1.1 auth-port 2222 timeout 5 retransmit 5 key test authtype pap primary (config)# no tacacs-server primary	
Error Messages	N/A	
Related Commands	N/A	

## Show TACACS+ Server Information

### Commands

**show tacacs server**

Syntax Description	<b>show</b>	Displays running information
	<b>tacacs-server</b>	Displays the TACACS server parameters
Defaults	N/A	
Command Modes	Privileged EXEC / User EXEC	
Usage Guidelines	N/A	
Examples	moxa# show tacacs-server	
Error messages	N/A	
Related commands	N/A	

## Diagnostics

### System Status

#### Utilization

### Show Device Current Information

#### Commands

**show env** {all | power | RAM | CPU }

Syntax Description	<b>show</b>	Display the statistics information
	<b>env</b>	Display switch information
	all	Show the current information for all resources such as CPU, RAM, and power
	power	Show the current power input information
	RAM	Show the current RAM information
	CPU	Show the current CPU information
Defaults	N/A	
Command Modes	Global configuration / User EXEC	
Usage Guidelines	N/A	
Examples	# show env all # show env power # show env RAM # show env CPU	
Error Messages	N/A	
Related Commands	N/A	

## Statistics

### Show Traffic Statistics

#### Commands

**show statistics** [ interface <interface-type> <interface-id> ]

Syntax Description	<b>show</b>	Display configuration/status information
	<b>statistics</b>	Display the interface statistics table
	interface-type	Display interface information
	interface-id	Display the specific interface information
Defaults	N/A	
Command Modes	Privileged EXEC Mode.	
Usage Guidelines	N/A	
Examples	moxa# show statistics interface ethernet 1/1	
Error Messages	N/A	
Related Commands	clear statistics	

### Clear Traffic Statistics

#### Commands

**clear statistics** [ interface < interface-type> <interface-id> ]

Syntax Description	<b>clear</b>	Clear input
	<b>statistics</b>	Clear statistics
	interface-type	The interface type
	interface-id	The interface ID
Defaults	N/A	
Command Modes	Privileged EXEC Mode.	
Usage Guidelines	N/A	
Examples	moxa# clear statistics Ethernet 1/1	
Error messages	N/A	
Related commands	show statistics	

## Module Information

### Show Module information

#### Commands

#### show product information

Syntax Description	<b>show</b>	Display configuration/status information		
	<b>product</b>	Display product information		
	<b>information</b>	Display product information		
Defaults	N/A			
Command Modes	User EXEC Privileged EXEC			
Usage Guidelines	N/A			
Examples	<pre>moxa# show product information Product Information   Model           : MDS-G4028   Serial Number   : 123456789ABC   MAC             : 00:01:03:05:07:09   Firmware Version : v0.3 Build 2019_0502_2111   Hardware Version : V0.0.0  Module Information   Type           Module Name   Serial Number   Hardware Version   Module [1]     MDS-G4028     123456789ABC   V0.0.0   Module [2]     --             --              --   Module [3]     --             --              --   Module [4]     --             --              --   Module [5]     --             --              --   Module [6]     --             --              --   Module [7]     --             --              --   Power Unit [1] --             --              --   Power Unit [2] --             --              --</pre>			
Error Messages	N/A			
Related Commands	N/A			

# Event Notification

## Event Notification

### Show Event Notification

#### Commands

**show event-notification** {general-event | poe-event | port-event | switching-event}

Syntax Description	<b>show</b>	Displays running information for the feature
	<b>event-notification</b>	Display event-notification configuration
	general-event	general event config
	poe-event	poe event config
	port-event	port event config
	switching-event	switching event config
Defaults	N/A	
Command Modes	Privileged EXEC /User EXEC	
Usage Guidelines	N/A	
Examples	<pre> moxa# show event-notification poe-event PD Power On Event Enable      :Enabled Registered Action :Trap, Email, PD Power Off Event Enable      :Enabled Registered Action :Trap, Email, Low Input Voltage Event Enable      :Enabled Registered Action :Trap, Email, PD Over Current Event Enable      :Enabled Registered Action :Trap, Email, PD No Response Event Enable      :Enabled Registered Action :Trap, Email, Over Power Budget Limit Event Enable      :Enabled Registered Action :Trap, Email, Power Detection Failure Event Enable      :Enabled Registered Action :Trap, Email,  moxa# show event-notification port-event Port link up Event Enable      :Enabled Registered Action :Trap, Email, Registered Port   :1/1, 1/2, 1/3, 1/4, 2/1, 2/2, 2/3, 2/4, 3/1, 3/2, 3/3, 3/4 , 4/1, 4/2, 4/3, 4/4, 5/1, 5/2, 5/3, 5/4, 6/1, 6/2, 6/3, 6/4, 7/1, 7/2, 7/3, 7/4 , Port link down Event Enable      :Enabled Registered Action :Trap, Email, Registered Port   :1/1, 1/2, 1/3, 1/4, 2/1, 2/2, 2/3, 2/4, 3/1, 3/2, 3/3, 3/4 </pre>	

	<pre>, 4/1, 4/2, 4/3, 4/4, 5/1, 5/2, 5/3, 5/4, 6/1, 6/2, 6/3, 6/4, 7/1, 7/2, 7/3, 7/4 , Port shutdown by Rate Limit Event Enable      :Enabled Registered Action :Trap, Email, Registered Port   :1/1, 1/2, 1/3, 1/4, 2/1, 2/2, 2/3, 2/4, 3/1, 3/2, 3/3, 3/4 , 4/1, 4/2, 4/3, 4/4, 5/1, 5/2, 5/3, 5/4, 6/1, 6/2, 6/3, 6/4, 7/1, 7/2, 7/3, 7/4 , Port recovery by Rate Limit Event Enable      :Enabled Registered Action :Trap, Email, Registered Port   :1/1, 1/2, 1/3, 1/4, 2/1, 2/2, 2/3, 2/4, 3/1, 3/2, 3/3, 3/4 , 4/1, 4/2, 4/3, 4/4, 5/1, 5/2, 5/3, 5/4, 6/1, 6/2, 6/3, 6/4, 7/1, 7/2, 7/3, 7/4 , Port shutdown by Port Security Event Enable      :Enabled Registered Action :Trap, Email, Registered Port   :1/1, 1/2, 1/3, 1/4, 2/1, 2/2, 2/3, 2/4, 3/1, 3/2, 3/3, 3/4 , 4/1, 4/2, 4/3, 4/4, 5/1, 5/2, 5/3, 5/4, 6/1, 6/2, 6/3, 6/4, 7/1, 7/2, 7/3, 7/4</pre>
Error Messages	N/A
Related Commands	<pre>event-notification general-event event-notification poe-event event-notification port-event event-notification switching-event</pre>



## Configure Event Notification Settings

### Commands

**event-notification general-event all**

**event-notification general-event cold-start**

**event-notification general-event all action trap mgmt-relay**

**event-notification general-event cold-start action email pwr1-relay**

**no event-notification general-event all**

**no event-notification general-event cold-start action email pwr2-relay**

Syntax Description	<b>no</b>	Disable the configuration/deletes the entry/reset to default value
	<b>event-notification</b>	Configure event notifications
	<b>general-event</b>	Configure notifications for general events
	<b>all</b>	Notify for all general events
	<b>cold-start</b>	Notify when the system performs a cold start
	<b>warm-start</b>	Notify when the system performs a warm start
	<b>config-change</b>	Notify when the system configuration changes
	<b>login-success</b>	Notify when a user successfully logs in
	<b>login-fail</b>	Notify when a user failed to log in
	<b>login-lockout</b>	Notify when a user is locked out due to the login policy
	<b>account-setting-changed</b>	Notify when the user account information changes, including create account, remove account, and change of username, permission
	<b>password-changed</b>	Notify when the user account password changes
	<b>config-import</b>	Notify when the system configuration is imported
	<b>ssl-certificated-changed</b>	Notify when system certification changes
	<b>log-capacity</b>	Notify when the system log reaches the capacity threshold
	<b>power-on</b>	Notify when the power supply is on
	<b>power-off</b>	Notify when the power supply is on
	<b>di-on</b>	Notify when the digital input is on
	<b>di-off</b>	Notify when the digital input is off
	<b>action</b>	Set action for event notification
<b>trap</b>	Set trap action for notification	
<b>email</b>	Set email action for notification	
<b>mgmt-relay</b>	Set MGMT relay action for notification	
<b>pwr1-relay</b>	Set PWR1 relay action for notification	
<b>pwr2-relay</b>	Set PWR2 relay action for notification	
Defaults	All configuration, trap, email event notifications are enabled by default	
Command Modes	Global configuration	
Usage Guidelines	N/A	
Examples	moxa# config moxa(config)# event-notification general-event all action trap moxa(config)# no event-notification general-event all action trap email	
Error Messages	N/A	
Related Commands	show event-notification event-notification poe-event event-notification port-event event-notification switching-event	

## Configure Notification for PoE Event

### Commands

**event-notification poe-event all**

**event-notification poe-event pd-power-on**

**event-notification poe-event all action trap mgmt-relay**

**event-notification poe-event pd-power-on action email pwr1-relay**

**no event-notification poe-event all**

**no event-notification poe-event cold-start action email pwr2-relay**

Syntax Description	<b>no</b>	Disable the configuration/delete the entry/reset to default value
	<b>event-notification</b>	Configure event notification
	<b>poe-event</b>	Configure notifications for PoE events
	<b>all</b>	Notify for all PoE events
	<b>pd-power-on</b>	Notify when a powered device powers on
	<b>pd-power-off</b>	Notify when a powered device powers off
	<b>low-input-voltage</b>	Notify when the input voltage from the power sourcing equipment is low
	<b>pd-over-current</b>	Notify when the current exceeds the threshold
	<b>pd-no-response</b>	Notify when the device does not receive a response from the powered device
	<b>over-power-budget-limit</b>	Notify when the PoE power consumption exceeds the budget
	<b>power-detection-failure</b>	Notify when a power failure is detected
	<b>action</b>	Set action for event notification
	<b>trap</b>	Set trap action for notification
	<b>email</b>	Set email action for notification
	<b>mgmt-relay</b>	Set MGMT relay action for notification
<b>pwr1-relay</b>	Set PWR1 relay action for notification	
<b>pwr2-relay</b>	Set PWR2 relay action for notification	
Defaults	All configuration, trap, email event notifications are enabled by default	
Command Modes	Global configuration	
Usage Guidelines	N/A	
Examples	moxa# config moxa(config)# event-notification poe-event all action trap moxa(config)# no event-notification poe-event all action trap email	
Error Messages	N/A	
Related Commands	show event-notification event-notification general-event event-notification port-event event-notification switching-event	

## Configure Notification for Port Event

### Commands

**event-notification port-event all**

**event-notification port -event cold-start**

**event-notification port -event all action trap mgmt-relay**

**event-notification port -event cold-start action email pwr1-relay**

**no event-notification port -event all**

**no event-notification port -event cold-start action email pwr2-relay**

Syntax Description	<b>no</b>	Disable the configuration/delete the entry/reset to default value
	<b>event-notification</b>	Configure event notifications
	<b>port-event</b>	Configure notifications for port events
	<b>all</b>	Notify for all port events
	<b>port-link-up</b>	Notify when a port link goes up
	<b>port-link-down</b>	Notify when a port link goes down
	<b>port-shutdown-by-rate-limit</b>	Notify when a port shuts down by rate limit
	<b>port-recovery-by-rate-limit</b>	Notify when a port recovers by rate limit
	<b>port-shutdown-by-port-security</b>	Notify when a port shuts down by port security
	<b>action</b>	Set action for event notification
	<b>trap</b>	Set trap action for notification
	<b>email</b>	Set email action for notification
	<b>mgmt-relay</b>	Set MGMT relay action for notification
	<b>pwr1-relay</b>	Set PWR1 relay action for notification
<b>pwr2-relay</b>	Set PWR2 relay action for notification	
Defaults	All configuration, trap, email event notifications are enabled by default Port event notifications for all ports are enabled by default	
Command Modes	Global configuration	
Usage Guidelines	N/A	
Examples	<pre>moxa# config moxa(config)# event-notification port-event all action trap moxa(config)# no event-notification port-event all action trap email moxa (config-if)# event-notification port-event all</pre>	
Error Messages	N/A	
Related Commands	<pre>show event-notification event-notification general-event event-notification poe-event event-notification switching-event</pre>	

## Configure Notification for Switching Event Settings

### Commands

**event-notification switching-event all**

**event-notification switching -event pd-power-on**

**event-notification switching -event all action trap mgmt-relay**

**event-notification switching -event pd-power-on action email pwr1-relay**

**no event-notification switching -event all**

**no event-notification switching -event cold-start action email pwr2-relay**

Syntax Description	<b>no</b>	Disable the configuration/deletes the entry/resets to default value
	<b>event-notification</b>	Configure event notifications
	<b>switching-event</b>	Configure notifications for switching events
	<b>all</b>	Notify for all switching events
	<b>topology-changed</b>	Notify when the network topology changes
	<b>Turbo-ring-topology changed</b>	Notify when the Turbo Ring v2 topology changes
	<b>Turbo-chain-topology changed</b>	Notify when the Turbo Chain topology changes
	<b>Dual-homing-topology changed</b>	Notify when the dual-homing topology changes
	<b>coupling-changed</b>	Notify when the Turbo Ring v2 coupling changes
	<b>master-changed</b>	Notify when the Turbo Ring v2 master changes
	<b>master-mismatched</b>	Notify when the Turbo Ring v2 master mismatches
	<b>rstp-topology-changed</b>	Notify when the RSTP network topology changes
	<b>rstp-root-changed</b>	Notify when the RSTP root device changes
	<b>rstp-migration</b>	Notify for RSTP migration
	<b>rstp-invalid-bpdu</b>	Notify when the RSTP device receives an invalid BPDU
	<b>rstp-new-port-role</b>	Notify when the RSTP port role changes
	<b>redundant-port-health-check-fail</b>	Notify when the redundant port health check fails
	<b>dual-homing-path-changed</b>	Notify when the dual homing path changes
	<b>dot1x-auth-fail</b>	Notify when 802.1x authentication fails
	<b>lldp-table-changed</b>	Notify when the LLDP remote table changes
	<b>rmon-raising-alarm</b>	Notify when RMON alarm variables values reach or exceed the raising threshold
	<b>rmon-falling-alarm</b>	Notify when RMON alarm variables values reach or fall below the falling threshold
	<b>action</b>	Set action for event notification
	<b>trap</b>	Set trap action for notification
<b>email</b>	Set email action for notification	
<b>mgmt-relay</b>	Set MGMT relay action for notification	
<b>pwr1-relay</b>	Set PWR1 relay action for notification	
<b>pwr2-relay</b>	Set PWR2 relay action for notification	
Defaults	All configuration, trap, email event notifications are enabled by default	
Command Modes	Global configuration	
Usage Guidelines	N/A	
Examples	<pre>moxa# config moxa(config)# event-notification switching-event all action trap moxa(config)# no event-notification switching -event all action trap email</pre>	
Error Messages	N/A	
Related Commands	show event-notification	

	event-notification general-event event-notification poe-event event-notification port-event
--	---

## Relay Alarm Cut-off

### Configure Relay Alarm Cut-off Settings

#### Commands

**relay alarm cut-off mgmt-relay**

**relay alarm cut-off pwr1-relay**

**relay alarm cut-off pwr2-relay**

Syntax Description	<b>relay</b>	Configure relay parameters
	<b>alarm</b>	Configure the relay alarm
	<b>cut-off</b>	Configure the relay alarm cut-off
	<b>mgmt-relay</b>	Cut off the mgmt-relay alarm
	<b>pwr1-relay</b>	Cut off the pwr1-relay alarm
	<b>pwr2-relay</b>	Cut off the pwr2-relay alarm
Defaults	N/A	
Command Modes	Global	
Usage Guidelines	N/A	
Examples	moxa# relay alarm cut-off mgmt-relay	
Error Messages	N/A	
Related Commands	N/A	

## Email Notification

### Configure Email Notification Server

#### Command

**email-notification server server-address** <ucast\_addr> [server-port <integer(1-65535)>] **username** <string(60)> **password** <string(60)>

Syntax Description	<b>email-notification</b>	Configure email notification parameters
	<b>server</b>	Configure server parameters
	<b>server-address</b>	Configure the email notification server IP address
	server-port	Configure the email-notification server port
	<b>username</b>	Configure the email notification server username
	<b>password</b>	Configure the email notification server password
Defaults	N/A	
Command Modes	Global configuration	
Usage Guidelines	N/A	
Examples	(config)# email-notification server-address 1.2.3.4 username aaa password bbb	
Error messages	N/A	
Related commands	N/A	

## Configure Email Notification Sender

### Commands

**email-notification sender** <string (60)>

Syntax Description	<b>email-notification</b>	Configure email notification parameters
	<b>sender</b>	Configure the email notification sender's email address
	string (60)	The sender's email address up to 60 characters
Defaults	N/A	
Command Modes	Global configuration	
Usage Guidelines	N/A	
Examples	(config)# email-notification sender testuser@test.com	
Error messages	Invalid Email Format	
Related commands	N/A	

## Configure Email Notification Server TLS Mode Setting

### Commands

**email-notification server tls** {enable | disable}

Syntax Description	<b>email-notification</b>	Configure email notification parameters
	<b>server</b>	Configure server parameters
	<b>tls</b>	Configure the email notification server TLS mode
	enable	Enable the TLS mode
	disable	Disable the TLS mode
Defaults	N/A	
Command Modes	Global configuration	
Usage Guidelines	N/A	
Examples	(config)# mail-server server tls enable (config)# mail-server server tls disable	
Error messages	N/A	
Related commands	N/A	

## Configure Email Notification Receiver

### Commands

**email-notification receiver** <string (60)> **index** <integer (1-5)>

**no email-notification receiver index** <integer (1-5)>

Syntax Description	<b>no</b>	Disable the configuration/delete the entry/reset to default value
	<b>email-notification</b>	Configure email notification parameters
	<b>receiver</b>	Configure the email notification receiver
	<b>index</b>	Configure the index of the receiver
	string (60)	The receiver's name up to 60 characters
	integer (1-5)	The number index of the receiver ranging from 1 to 5
Defaults	N/A	
Command Modes	Global configuration	
Usage Guidelines	N/A	
Examples	(config)# email-notification receiver testuser@test.com index 1 (config)# no email-notification receiver index 1	
Error Messages	Invalid Email Format	
Related Commands	N/A	

## Show Email Notification Server

### Commands

#### show email-notification server

Syntax Description	<b>show</b>	Display the configuration/statistics/general information
	<b>email-notification</b>	Display email notification parameters
	<b>server</b>	Display server parameters
Defaults	N/A	
Command Modes	Privileged EXEC / User EXEC	
Usage Guidelines	N/A	
Examples	# show email-notification server	
Error Messages	N/A	
Related Commands	N/A	

## Syslog

### Configure Logging Server

#### Commands

**logging-server** <short(1-3)> { ipv4 <ucast\_addr> | <dns\_host\_name> } [ port <integer(1-65535)>]

Syntax Description	<b>logging-server</b>	Configure logging server parameters
	short (1-3)	The index of the syslog server
	ipv4	Configure IPv4 parameters
	ucast_addr	The IP address
	dns_host_name	The host domain name
	port	Configure port parameters
	integer (1-65535)	The port number
Defaults	N/A	
Command Modes	Privileged EXEC Global Configuration	
Usage Guidelines	N/A	
Examples	moxa(config)# logging-server 1 ipv4 10.128.1.8 port 514	
Error Messages	'Invalid: The server addresses are duplicated.' 'Invalid: The syslog server address cannot be empty if it is enabled.'	
Related Commands	no logging-server <short(1-3)> show logging server	

## Delete Logging Server

### Commands

**no logging-server** <short(1-3)> [ enable ]

Syntax Description	<b>no</b>	Remove configuration / delete entry / reset to default value
	<b>logging-server</b>	Configure logging server parameters
	short (1-3)	The index of the syslog server
	enable	Disable this server entry
Defaults	N/A	
Command Modes	Global Configuration	
Usage Guidelines	N/A	
Examples	moxa(config)# no logging-server 1	
Error Messages	N/A	
Related Commands	logging-server <short(1-3)> {ipv4 <uicast_addr>   <dns_host_name>} [ port <integer(1-65535)>] show logging syslog-server	

## Enable/Disable Logging Syslog Server

### Commands

**logging syslog-server** { enable | disable }

Syntax Description	<b>logging</b>	Configure logging parameters
	<b>syslog-server</b>	Configure the syslog server
	enable	Enable the syslog server
	disable	Disable the syslog server
Defaults	N/A	
Command Modes	Global Configuration	
Usage Guidelines	N/A	
Examples	moxa(config)# logging syslog-server { enable   disable }	
Error Messages	'Invalid: The server addresses are duplicated.' 'Invalid: The syslog server address cannot be empty if it is enabled.'	
Related Commands	show logging server	



## Show Syslog Server Configuration

### Commands

#### show logging syslog-server

Syntax Description	<b>show</b>	Display configuration/status information
	<b>logging</b>	Display logging information
	<b>syslog-server</b>	Display syslog server information
Defaults	N/A	
Command Modes	Privileged EXEC / User EXEC	
Examples	<pre>moxa# show logging syslog-server  Syslog Server Configuration  Syslog Enable: disable  Index      Server Address                Port      Status -----  - 1          111.2.21.1                    514      enable 2          200.2.2.2                     2540     enable 3                                     disable</pre>	
Help Message	Display the Syslog logging server table	
Error Messages	N/A	
Related Commands	<pre>logging server enable logging-server &lt;short(1-3)&gt; {ipv4 &lt;ucast_addr&gt;   &lt;dns_host_name&gt;} [ port &lt;integer(1-65535)&gt;]</pre>	

## Diagnosis

### LLDP

#### Show LLDP Information

##### Commands

##### show lldp

Syntax Description	<b>show</b>	Display configuration/statistics/general information
	<b>lldp</b>	Display global LLDP information
Defaults	N/A	
Command Modes	Privileged EXEC User EXEC	
Usage Guidelines	Display the global LLDP settings	
Examples	<pre>moxa# show lldp  LLDP is disabled Transmit Interval      : 30 Holdtime Multiplier   : 4 Reinitialization Delay : 2 Tx Delay               : 2 Notification Interval : 5 Chassis Id SubType    : Mac Address Chassis Id             : 00:01:02:03:04:05</pre>	
Error Messages	N/A	
Related Commands	<pre>config lldp {enable   disable} config lldp chassis-id-subtype { chassis-comp &lt;string(255)&gt;   if-alias   port-comp &lt;string(255)&gt;   mac-addr   nw-addr   if-name   local &lt;string(255)&gt; } config lldp holdtime-multiplier &lt;2-10&gt; config lldp notification-interval &lt;seconds(5-3600)&gt; config lldp reinitialization-delay &lt;seconds(1-10)&gt; config lldp transmit-interval &lt;seconds(5-32768)&gt; config lldp tx-delay (1-8192)</pre>	

## Show LLDP Interface

### Commands

#### show lldp interface

Syntax Description	<b>show</b>	Display configuration/statistics/general information
	<b>lldp</b>	Display the LLDP interface status
	<b>interface</b>	Show the LLDP interface information
Defaults	N/A	
Command Modes	Privileged EXEC User EXEC	
Usage Guidelines	Display LLDP port interface information	
Examples	<pre>moxa#show lldp interface Eth1/3: Tx State           : Enabled Rx State           : Enabled Tx SEM State       : INITIALIZE Rx SEM State       : WAIT PORT OPERATIONAL Notification Status : Enabled Notification Type  : Remote Table Chang DestinationMacAddr : 01:80:c2:00:00:0e</pre>	
Error Messages	N/A	
Related Commands	<pre>show lldp config-if &gt; lldp {transmit   receive} config-if &gt; lldp dest-mac &lt;mac_addr&gt;</pre>	

## Show LLDP Neighbors

### Commands

#### show lldp neighbors

Syntax Description	<b>show</b>	Display configuration/statistics/general information
	<b>ldp</b>	Display the LLDP interface status
	<b>neighbors</b>	Display the LLDP remote interface database
Defaults	N/A	
Command Modes	Privileged EXEC User EXEC	
Usage Guidelines	Display LLDP neighbor interface information	
Examples	<pre>moxa# show lldp neighbors  Capability Codes   : (R) Router, (B) Bridge, (T) Telephone, (C) DOCSIS Cable Device, (W) WLAN Access Point, (P) Repeater, (S) Station, (O) Other  Chassis Id SubType      : Mac Address Chassis Id              : 00:90:e8:10:20:30 Port Id SubType         : Local Port Id                 : 1 Port Description        : 1000TX,RJ45. System Name             : -- System Desc             : EDS-G512E Local Intf              : Eth1/3 Time Remaining          : 19 Seconds System Capabilities Supported : B System Capabilities Enabled  : B Management Addresses    : IfId SubType Address    :                               OID .....</pre>	
Error Messages	N/A	

## Show LLDP Statistics

### Commands

#### Show lldp statistics

Syntax Description	<b>show</b>	Display configuration/statistics/general information
	<b>lldp</b>	Display the LLDP interface LLDP status
	<b>statistics</b>	Display LLDP remote table statistics information
Defaults	N/A	
Command Modes	Privileged EXEC User EXEC	
Usage Guidelines	Display LLDP statistics for the local counter	
Examples	<pre>moxa# show lldp statistics  Remote Table Last Change Time : 182700 Remote Table Inserts           : 2 Remote Table Deletes           : 0 Remote Table Drops             : 0 Remote Table Ageouts           : 0 Remote Table Updates           : 0</pre>	
Error Messages	N/A	
Related Commands	show lldp	

## Show LLDP Error

### Commands

#### show lldp error

Syntax Description	<b>show</b>	Display configuration/statistics/general information
	<b>lldp</b>	Configure LLDP parameters
	<b>error</b>	Display LLDP error information such as memory allocation failures, queue overflows, and table overflows
Defaults	N/A	
Command Modes	Privileged EXEC User EXEC	
Usage Guidelines	Display the LLDP error counter	
Examples	<pre>moxa# show lldp errors  Total Memory Allocation Failures : 0 Total Input Queue Overflows      : 0 Total Table Overflows            : 0</pre>	
Error Messages	N/A	
Related Commands	<pre>show lldp config lldp enable config-if lldp tlv-select basic-tlv config-if lldp tlv-select dot1t1v config-if lldp tlv-select dot3tlv</pre>	

## Show LLDP Traffic

### Commands

#### show lldp traffic

Syntax Description	<b>show</b>	Display configuration/statistics/general information
	<b>lldp</b>	Display the LLDP interface status
	<b>traffic</b>	Display the LLDP local traffic
Defaults	N/A	
Command Modes	Privileged EXEC User EXEC	
Usage Guidelines	Display LLDP traffic for the local counter	
Examples	<pre>moxa# show lldp traffic</pre> <p>Total Frames Out : 82  Total Entries Aged : 0  Total Frames In : 81  Total Frames Received In Error : 81  Total Frames Discarded : 0  Total TLVs Unrecognized : 324  Total TLVs Discarded : 0  Total PDU length error Drops : 0</p>	
Error Messages	N/A	
Related Commands	<pre>show lldp</pre> <pre>config-if &gt; lldp {transmit   receive}</pre> <pre>config-if &gt; lldp dest-mac &lt;mac_addr&gt;</pre>	

## Enable/Disable LLDP Function

### Commands

#### lldp enable

#### lldp disable

Syntax Description	<b>lldp</b>	Configure LLDP parameters
	<b>enable</b>	Enable LLDP
	<b>disable</b>	Disable LLDP
Defaults	Enable	
Command Modes	Privileged EXEC Global Configuration	
Usage Guidelines	Enable or disable global LLDP	
Examples	<pre>moxa (config)# lldp enable</pre> <pre>moxa (config)# lldp disable</pre>	
Error Messages	N/A	
Related Commands	<pre>show lldp</pre> <pre>show lldp interface</pre> <pre>show lldp neighbors</pre> <pre>show lldp traffic</pre> <pre>show lldp errors</pre> <pre>show lldp statistics</pre>	

## Configure Global LLDP Timer Interval

### Commands

**lldp transmit-interval** <seconds (5-32768)>

**no lldp transmit-interval**

Syntax Description	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>lldp</b>	Configure LLDP parameters
	<b>transmit-interval</b>	Configure the transmit interval
	seconds	The interval time ranging from 5 to 32768 seconds
Defaults	The interval between successive transmit cycles is set to 30 seconds by default	
Command Modes	Privileged EXEC Global Configuration	
Usage Guidelines	Configure the global LLDP transmit interval time	
Examples	moxa(config)# lldp transmit-interval 30 moxa(config)# no lldp transmit-interval	
Error Messages	N/A	
Related Commands	show lldp config lldp enable	

## Configure LLDP Holdtime Multiplier

### Commands

**lldp holdtime-multiplier** <value (2-10)>

**no lldp holdtime-multiplier**

Syntax Description	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>lldp</b>	Configure LLDP parameters
	<b>holdtime-multiplier</b>	A multiplier on the transmit-interval used to compute the TTL value of txTTL.
	value	The multiplier value ranging from 2 to 10
Defaults	The default holdtime multiplier is set to 4	
Command Modes	Privileged EXEC Global Configuration	
Usage Guidelines	N/A	
Examples	moxa(config)# lldp holdtime-multiplier 4 moxa(config)# no lldp holdtime-multiplier	
Error Messages	N/A	
Related Commands	show lldp config lldp enable config lldp tx-delay	

## Configure LLDP Transmission Delay Time

### Commands

**lldp tx-delay** <seconds (1-8192) // tx\_delay <= (0.25 x transmit-interval)

**no lldp tx-delay**

Syntax Description	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>lldp</b>	Configure LLDP parameters
	<b>tx-delay</b>	Configure the minimum delay between successive LLDP frame transmissions
	seconds	The transmission delay time in seconds ranging from 1 to 8192
Defaults	The default LLDP transmission delay time is set to 2 seconds	
Command Modes	Privileged EXEC Global Configuration	
Usage Guidelines	Configure the LLDP tx-delay parameter	
Examples	moxa(config)# lldp tx-delay 4 moxa(config)# no lldp tx-delay	
Error Messages	"Invalid: Tx Delay should be less than or equal to the value = 0.25 * Transmit Interval."	
Related Commands	show lldp config lldp enable config lldp transmit-interval	

## Configure LLDP Reinitialization Delay Time

### Commands

**lldp reinitialization-delay** <seconds (1-10)>

**no lldp reinitialization-delay**

Syntax Description	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>lldp</b>	Configure LLDP parameters
	<b>reinitialization-delay</b>	Configure the delay after admin status becomes 'disabled' before re-initialization is attempted
	seconds	The reinitialization delay ranging from 1 to 10 seconds
Defaults	The default reinitialization delay time is set to 2 seconds	
Command Modes	Privileged EXEC Global Configuration	
Usage Guidelines	Configure the LLDP re-initialization delay time	
Examples	moxa(config)# lldp reinitialization-delay 4 moxa(config)# no lldp reinitialization-delay	
Error Messages	N/A	
Related Commands	show lldp config lldp enable	



## Configure LLDP Notification Interval Time

### Commands

**lldp notification-interval** <seconds(5-3600)>

**no lldp notification-interval**

Syntax Description	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>lldp</b>	Configure LLDP parameters
	<b>notification-interval</b>	Configure lldpRemTableChange event notifications
	seconds	The notification interval ranging from 5 to 3600 seconds
Defaults	The default notification interval time is set to 5 seconds	
Command Modes	Privileged EXEC Global Configuration	
Usage Guidelines	Configure the LLDP notification interval time	
Examples	moxa(config)# lldp notification-interval 5 moxa(config)# no lldp notification-interval	
Error Messages	N/A	
Related Commands	show lldp config lldp enable	

## Configure LLDP Global Setting

### Commands

**lldp chassis-id-subtype** { chassis-comp <string(255)> | if-alias | port-comp <string(255)> | mac-addr | nw-addr | if-name | local <string(255)> }

Syntax Description	<b>lldp</b>	Configure LLDP parameters
	<b>chassis-id-subtype</b>	Configure chassis-component and local system sybtypes
	chassis-comp	Represents a chassis identifier based on the value of entPhysicalAlias object for a chassis component
	if-alias	Represents a chassis identifier based on the value of ifAlias for an interface on the containing chassis
	port-comp	Represents a chassis identifier based on the value of entPhysicalAlias object for a port or backplane within the chassis
	mac-addr	Represents a chassis identifier based on the value of a unicast source address of a port on the chassis
	nw-addr	Represents a chassis identifier based on a network address associated with a particular chassis. The encoded address is actually composed of two fields. The first field is a single octet, representing the IANA AddressFamilyNumbers value for the specific address type, and the second field is the network address value.
	if-name	Represents a chassis identifier based on the value of a ifName pbject for an interface on the containing chassis
local	Represents a chassis identifier based on a locally defined value.	
Defaults	mac-addr use sys_mac, others are none.	
Command Modes	Privileged EXEC Global Configuration	
Usage Guidelines	Configure the LLDP chassis ID subtype parameters	
Examples	moxa (config)# lldp chassis-id-subtype chassis-comp moxa	
Error Messages	N/A	
Related Commands	show lldp show lldp local config lldp enable	

## Configure LLDP Port Setting

### Commands

**lldp** {transmit | receive}

**no lldp** {transmit | receive}

Syntax Description	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>lldp</b>	Configure LLDP parameters
	transmit	Enable the transmission of LLDPDU from one of the ports of the server to the LLDP module
	receive	Enable the reception of LLDPDU from one of the ports of the server to the LLDP module
Defaults	mac-addr use sys_mac LLPDU transmitting and receiving are both enabled by default	
Command Modes	Privileged EXEC Interface Configuration	
Usage Guidelines	Configure the LLDP TX or RX for the port interface	
Examples	moxa(config-if)# lldp transmit moxa(config-if)# no lldp transmit	
Error Messages	N/A	
Related Commands	show lldp show lldp interface	

## Configure LLDP Port ID Subtype

### Commands

**lldp port-id-subtype** { if-alias | port-comp <string(255)> | mac-addr | if-name | local <string(255)> }

Syntax Description	<b>lldp</b>	Configure LLDP parameters
	<b>port-id-subtype</b>	Configure LLDP port subtype
	if-alias	Represents a chassis identifier based on the value of ifAlias for an interface on the containing chassis
	port-comp	Represents a chassis identifier based on the value of entPhysicalAlias object for a port or backplane within the chassis
	mac-addr	Represents a chassis identifier based on the value of a unicast source address, of a port on the chassis
	if-name	Represent a chassis identifier based on the value of a ifName pbject for an interface on the containing chassis
	local	Represent a chassis identifier based on a locally defined value.
Defaults	mac-addr use sys_mac, others are none.	
Command Modes	Privileged EXEC Global Configuration	
Usage Guidelines	Configure the LLDP notification interval time	
Examples	moxa(config)# lldp notification-interval 5 moxa(config)# no lldp notification-interval	
Error Messages	N/A	
Related Commands	show lldp config lldp enable	

## Configure LLDP TLV Setting

### Commands

**lldp tlv-select basic-tlv** { port-descr | sys-name | sys-descr | sys-capab | }

Syntax Description	<b>lldp</b>	Configure LLDP parameters
	<b>tlv-select</b>	Configure the transmission basic LLDP TLVs
	<b>basic-tlv</b>	Configure basic TLVs
	port-descr	Enable basic TVLs transmission for the administratively assigned description for the port
	sys-name	Enable basic TLV transmission for the administratively assigned system name
	sys-descr	Enable basic TLV transmission for the administratively assigned system description
	sys-capab	Enable the system capabilities of the basic TLV transmission
Defaults	mac-addr use sys_mac, others are none	
Command Modes	Privileged EXEC Interface Configuration	
Usage Guidelines	Configure the LLDP basic TLV	
Examples	moxa (config-if)# lldp tlv-select basic-tlv port-descr moxa (config-if)# no lldp tlv-select basic-tlv port-descr	
Error Messages	"Invalid: The format of Basic Transmit TLVs are Port Description, Device Name, Device Description, and Device Capability."	
Related Commands	show lldp local	

## Configure LLDP TLV DOT1 Setting

### Commands

**lldp tlv-select dot1tlv** { port-vlan-id | {all |<vlan-id>} | vlan-name {all |} | }

Syntax Description	<b>lldp</b>	Configure LLDP parameters
	<b>tlv-select</b>	Configure the transmission basic LLDP TLVs
	<b>dot1tlv</b>	Configure specific 802.1 TLVs
	port-vlan-id	Specify the VLAN ID of the port that uniquely identifies a specific VLAN. The VLAN ID is associated with a specific group of protocols for the specific port.
	protocol-vlan-id	Specify the Protocol ID that represents a specific group of protocols that are associated together when assigning a VID to a frame. This group ID is associated with the specific port. All : Set the protocol ID as all vlan-id : Set the protocol ID as the mentioned vlan ID Only work for the 2009 version.
	vlan-name	Specify the administratively assigned VLAN string.
Defaults	N/A.	
Command Modes	Privileged EXEC Interface Configuration	
Usage Guidelines	Configure LLDP DOT1 TLV	
Examples	moxa (config-if)# lldp tlv-select dot1tlv port-vlan-id moxa (config-if)# no lldp tlv-select dot1tlv port-vlan-id	
Error Messages	N/A	
Related Commands	show lldp local show lldp neighbors show lldp errors	

## Configure LLDP TLV DOT3 Setting

### Commands

**lldp tlv-select dot3tlv** { link-aggregation | max-framesize }

Syntax Description	<b>lldp</b>	Configure LLDP parameters
	<b>tlv-select</b>	Configure the transmission basic LLDP TLVs
	<b>dot3tlv</b>	Configure specific 802.3 TLVs
	link-aggregation	Configure the link aggregation protocol statistics for each port on the device
	Max-framesize	The maximum frame size of the TLV
Defaults	N/A.	
Command Modes	Privileged EXEC Interface Configuration	
Usage Guidelines	Configure the LLDP DOT3 TLV	
Examples	moxa (config-if)# lldp tlv-select dot3tlv macphy-config moxa (config-if)# no lldp tlv-select dot3tlv macphy-config	
Error Messages	"Invalid: The value of 802.3 Transmit TLVs capability are Link Aggregation Statistics and Maximum Frame Size."	
Related Commands	show lldp local show lldp neighbors show lldp errors	

## Port Mirror

### Enable/Disable Mirroring

#### Commands

**port-mirror** {enable | disable}

Syntax Description	<b>port-mirror</b>	Configure port mirror parameters
	enable	Enable mirroring in the system
	disable	Disable mirroring in the system
Defaults	Port mirroring is enabled by default	
Command Modes	Global Configuration Mode	
Usage Guidelines	N/A	
Examples	moxa# configure moxa(config)# port-mirror enable  moxa# configure moxa(config)# port-mirror disable	
Error Messages	N/A	
Related Commands	moxa# show monitor { session <session-id (1-5)>   range <session-list> }	

## Show Mirroring Information

### Commands

**show monitor** { session <session-id (1-5)> | range <session-list> }

Syntax Description	<b>show</b>	Display configuration/status information
	<b>monitor</b>	Display port mirror information
	session	The mirroring information related to a specific session
	session-id	The index of the mirroring session
	range	The mirroring information for the specified list of mirroring sessions
	session-list	The session list
Defaults	N/A	
Command Modes	Privileged EXEC Mode	
Usage Guidelines	N/A	
Examples	<pre> moxa# show monitor session 1  Mirroring is globally Enabled.   Session      : 1   -----   Source Ports     Rx          : None     Tx          : None     Both        : Eth1/1   Destination Ports : Eth1/2   Session Status  : Active  moxa# show monitor range 1-5  Mirroring is globally Enabled.   Session      : 1   -----   Source Ports     Rx          : None     Tx          : None     Both        : Eth1/1   Destination Ports : Eth1/2   Session Status  : Active    Session      : 2   -----   Source Ports     Rx          : None     Tx          : None     Both        : Eth1/3   Destination Ports : Eth1/4   Session Status  : Active  % Session 3 does not exist % Session 4 does not exist % Session 5 does not exist </pre>	
Error Messages	<pre> % Invalid: Monitor session range must be in between (1-5) Example: Key "range 1-6" % Invalid: Invalid Session List Example: Key "range 0-5" </pre>	
Related Commands	N/A	

## Configure the Source for a Mirroring Session

### Commands

**monitor session** <session-id (1-5)> { source { interface <interface-type> <interface-id> [{ rx | tx | both }]} }

Syntax Description	<b>monitor</b>	Configure port mirroring parameters
	<b>session</b>	Configure the mirroring session
	session-id	The index of the mirroring session
	source	Configure the mirroring source port
	interface	Configure the interface
	interface-type	The interface type
	interface-id	The interface number
	rx, tx, both	Mirror received, transmitted, or both types of traffic
Defaults	The traffic type to mirror is set to both by default	
Command Modes	Global Configuration Mode	
Usage Guidelines	N/A	
Examples	<pre>moxa# configure moxa(config)# monitor session 1 source interface ethernet 1/1  moxa# configure moxat(config)# monitor session 1 source interface ethernet 1/1 rx  moxa# configure moxa(config)# monitor session 1 source interface ethernet 1/1 tx</pre>	
Error Messages	<pre>% Invalid: Duplicate Rx Source Port. % Invalid: Duplicate Tx Source Port. % Invalid: Destination Port conflicts with Tx Source Port or Rx Source Port. % Invalid: Exceed Max Mirror Port. % Invalid: If the port is a Port-Channel member, it cannot be set to the destination port, RX source port, or TX source port.</pre>	
Related Commands	<pre>moxa(config)# no monitor session &lt;session-id (1-5)&gt; { source { interface &lt;interface-type&gt; &lt;interface-id&gt; } }</pre>	

## Remove Source Port Configurations for a Mirroring Session

### Commands

**no monitor session** <session-id (1-5)> { source { interface <interface-type> <interface-id> } }

Syntax Description	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>monitor</b>	Configure port mirroring parameters
	<b>session</b>	Configure the mirroring session
	session-id	The index of the mirroring session
	source	Configure the mirroring source port
	interface	Configure the interface
	interface-type	The interface type
	interface-id	The interface number
Defaults	N/A	
Command Modes	Global Configuration Mode	
Usage Guidelines	N/A	
Examples	<pre>moxa# configure moxa(config)# no monitor session 1 source interface ethernet 1/1</pre>	
Error Messages	N/A	
Related Commands	<pre>moxa(config)# monitor session &lt;session-id (1-5)&gt; { source { interface &lt;interface-type&gt; &lt;interface-id&gt; [{ rx   tx   both }]} }</pre>	

## Configure the Destination for a Mirroring Session

### Commands

**monitor session** <session-id (1-5)> destination { interface <interface-type> <interface-id> }

Syntax Description	<b>monitor</b>	Configure port mirroring parameters
	<b>session</b>	Configure the mirroring session
	session-id	The index of the mirroring session
	destination	Configure the mirroring destination port
	interface	Configure the interface
	interface-type	The interface type
	interface-id	The interface number
Defaults	N/A	
Command Modes	Global Configuration Mode	
Usage Guidelines	N/A	
Examples	moxa# configure moxa(config)# monitor session 1 destination interface ethernet 1/1	
Error Messages	<p>% Invalid: Duplicate Destination Port.</p> <p>% Invalid: Destination Port conflicts with Tx Source Port or Rx Source Port.</p> <p>% Invalid: If the port is a Port-Channel member, it cannot be set to the destination port, RX source port, or TX source port.</p> <p>% Invalid: If the port is set as the ring port of Turbo Ring v2, it cannot be set to the destination port.</p> <p>% Invalid: If the port is set as the coupling port of Turbo Ring v2, it cannot be set to the destination port.</p> <p>% Invalid: If the port is set as the Turbo Chain head/tail/member port, it cannot be set to the destination port.</p> <p>% Invalid: If the port is set as the RSTP port, it cannot be set to the destination port.</p> <p>% Invalid: If the port is set as the Dual Homing redundant port, it cannot be set to the destination port.</p>	
Related Commands	moxa(config)# no monitor session <session-id (1-5)> destination { interface <interface-type> <interface-id> }	

## Delete the Destination Configuration for a Mirroring Session

### Commands

**no monitor session** <session-id (1-5)> destination { interface <interface-type> <interface-id> }

Syntax Description	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>monitor</b>	Configure port mirroring parameters
	<b>session</b>	Configure the mirroring session
	session-id	The index of the mirroring session
	destination	Configure the mirroring destination port
	interface	Configure the interface
	interface-type	The interface type
interface-id	The interface number	
Defaults	N/A	
Command Modes	Global Configuration Mode	
Usage Guidelines	N/A	
Examples	moxa# configure moxa(config)# no monitor session 1 destination interface ethernet 1/1	
Error Messages	N/A	
Related Commands	moxa(config)# monitor session <session-id (1-5)> destination { interface <interface-type> <interface-id> }	

## Delete Mirroring Configurations

### Commands

**no monitor session** { range <session-list> | session-id (1-5)}

Syntax Description	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>monitor</b>	Configure port mirroring parameters
	<b>session</b>	Configure the mirroring session
	range	The list of sessions for which the mirroring configuration should be removed
	session-list	The session list
	session-id	The index of the mirroring session
Defaults	N/A	
Command Modes	Global Configuration Mode	
Usage Guidelines	N/A	
Examples	moxa# configure moxa(config)# no monitor session 1  moxa# configure moxa(config)# no monitor session range 1-5	
Error Messages	% Invalid: Monitor session range must be in between (1-5) Example: Key "range 1-6" % Invalid: Invalid Session List Example: Key "range 0-5"	
Related Commands	N/A	



## Ping

### Ping the Host

#### Commands

**ping host** [ repeat repeat-count ] [ size payload-size ] [ timeout request-timeout ]

Syntax Description	<b>ping</b>	Ping a target to check its status
	<b>host</b>	The IP address or domain name of the node to be pinged
	repeat	The number of ping packets that are sent to the destination address
	repeat-count	The repeat value
	size	The ize of the ping packet
	payload-size	The length of the ping packet value
	timeout	The time in seconds after which the entity waiting for the ping response times out
	request-timeout	The timeout value
Defaults	N/A	
Command Modes	User EXEC Privileged EXEC	
Usage Guidelines	N/A	
Examples	<pre>moxa# ping 192.168.127.254 repeat 5 PING 192.168.127.254 (192.168.127.254) 56(84) bytes of data. 64 bytes from 192.168.127.254: icmp_seq=1 ttl=64 time=1.52 ms 64 bytes from 192.168.127.254: icmp_seq=2 ttl=64 time=0.803 ms 64 bytes from 192.168.127.254: icmp_seq=3 ttl=64 time=0.879 ms 64 bytes from 192.168.127.254: icmp_seq=4 ttl=64 time=0.791 ms 64 bytes from 192.168.127.254: icmp_seq=5 ttl=64 time=0.845 ms  --- 192.168.127.254 ping statistics --- 5 packets transmitted, 5 received, 0% packet loss, time 4002ms rtt min/avg/max/mdev = 0.791/0.968/1.523/0.279 ms</pre>	
Error Messages	N/A	
Related Commands	N/A	

## ARP Table

### Show IP ARP Table

#### Commands

##### show ip arp

Syntax Description	<b>show</b>	Display configuration/status information
	<b>ip</b>	Display IP information
	<b>arp</b>	Display the ARP table
Defaults	N/A	
Command Modes	User EXEC Privileged EXEC	
Usage Guidelines	N/A	
Examples	<pre>moxa# show ip arp IP Address      MAC Address ----- 192.168.127.113 00:05:1b:a1:ae:62 192.168.127.112 00:05:1b:a3:53:d6</pre>	
Error Messages	N/A	
Related Commands	N/A	

## Event Log

### Show Logging Event Log

#### Commands

##### show logging event-log

Syntax Description	<b>show</b>	Display configuration/status information
	<b>logging</b>	Display logging information
	<b>event-log</b>	Display event log entries
Defaults	N/A	
Command Modes	Privileged EXEC / User EXEC	
Examples	<pre>moxa# show logging event-log  Total number of log entries = 7 Boot SEV  Timestamp           Message ----- 19  5    2018-02-05 12:00:51 [Account:admin] successfully logged in via local. 19  5    2018-02-05 12:00:14 Port 7/4 link up. 19  5    2018-02-05 12:00:12 Port 7/1 link up. 19  5    2018-02-05 12:00:11 Port 7/2 link up. 19  5    2018-02-05 12:00:11 System has performed a warm start. 19  5    2018-02-05 12:00:09 Port 4/3 link up. 19  5    2018-02-05 12:00:08 Port 4/4 link up.</pre>	
Help Message	Display the log entries information	
Error Messages	N/A	
Related Commands	clear logging event-log	

## Show Logging Log Capacity

### Commands

#### show logging log-capacity

Syntax Description	<b>show</b>	Display configuration/status information
	<b>logging</b>	Display logging information
	<b>log-capacity</b>	Display log capacity information
Defaults	N/A	
Command Modes	Privileged EXEC / User EXEC	
Usage Guidelines	N/A	
Examples	moxa# show logging log-capacity	
Error Messages	N/A	
Related Commands	N/A	

## Clear Logging Event Log

### Commands

#### clear logging event-log

Syntax Description	<b>clear</b>	Clear the event
	<b>logging</b>	Display logging information
	<b>event-log</b>	The local event log entries to be cleared
Defaults	N/A	
Command Modes	Privileged EXEC	
Usage Guidelines	N/A	
Examples	moxa# clear logging event-log	
Error Messages	N/A	
Related Commands	show logging event-log	

## Export Event Log File

### Commands

#### copy event-log {tftp://server/filename | sftp://<user-name>:<pass-word>@server/filename}

Syntax Description	<b>copy</b>	Copy the target file or input
	<b>event-log</b>	The system event log
	tftp://server/filename	The address of the remote TFTP server in the format "tftp://server/filename"
	sftp://<username>:<password> @server/filename	The address of the remote SFTP server in the format "sftp://username:password@server/filename"
Defaults	N/A	
Command Modes	Privileged EXEC	
Usage Guidelines	N/A	
Examples	moxa# copy event-log tftp://192.168.127.11/test1.log	
Help Message	Copy the system logs to a remote site	
Error Messages	N/A	
Related Commands	show logging event-log	

## Configure Event Log Capacity Settings

### Commands

**logging log-capacity threshold** <short (50-100)>

Syntax Description	<b>logging</b>	Configure logging parameters
	<b>log-capacity</b>	Configure the log capacity
	<b>threshold</b>	Configure the log capacity threshold
	short (50-100)	The log capacity threshold in percentage
Defaults	The default log threshold is set to 80 entries	
Command Modes	Privileged EXEC Global Configuration	
Usage Guidelines	N/A	
Examples	moxa(config)# logging log-capacity threshold <short(50-100)>	
Error Messages	N/A	
Related Commands	N/A	

## Delete Logging Log Capacity Threshold

### Commands

**no logging log-capacity threshold**

Syntax Description	<b>no</b>	Remove configuration / delete entry / reset to default value
	<b>logging</b>	Configure logging parameters
	<b>log-capacity</b>	Configure the log capacity
	<b>threshold</b>	Configure the log capacity threshold
Defaults	The default log threshold is set to 80 entries	
Command Modes	Privileged EXEC Global Configuration	
Usage Guidelines	N/A	
Examples	moxa(config)# no logging log-capacity threshold	
Error Messages	N/A	
Related Commands	logging log-capacity threshold	

## Configure Oversized Log Action Setting

### Commands

**logging oversize-action** { overwrite-oldest | stop-recording }

Syntax Description	<b>logging</b>	Configure logging parameters
	<b>oversize-action</b>	Configure the action when exceeding the log threshold
	overwrite-oldest	Overwrite the oldest entry
	stop-recording	Stop recording events
Defaults	N/A	
Command Modes	Privileged EXEC Global Configuration	
Usage Guidelines	N/A	
Examples	moxa(config)# logging oversize-action { overwrite-oldest   stop-recording }	
Error Messages	N/A	
Related Commands	N/A	

## Copy Event Log

### Commands

**copy event-log** { <tftp\_url> | <sftp\_url> }

Syntax Description	<b>copy</b>	Copy the target file or input
	<b>event-log</b>	The system event log
	tftp_url	The address of the remote TFTP server in the format "tftp://server/filename"
	sftp_url	The address of the remote SFTP server in the format "sftp://username:password@server/filename"
Defaults	N/A	
Command Modes	Privileged EXEC	
Usage Guidelines	N/A	
Examples	moxa# copy event-log tftp://www.test.com	
Error messages	N/A	
Related commands	N/A	

## Maintenance and Tool

### Locator

#### Show the Locator

### Commands

**locator** [ duration ]

Syntax Description	<b>locator</b>	Activate the device locator so that the LED on the device blinks
	duration	The duration of locator activation in seconds
Defaults	The locator duration is set to 60 seconds by default	
Command Modes	Privileged EXEC	
Usage Guidelines	N/A	
Examples	moxa# locator 100	
Error Messages	N/A	
Related Commands	N/A	

### Reboot

#### Reboot the Switch

### Commands

**reload**

Syntax Description	<b>reload</b>	Perform a warm restart
Defaults	N/A	
Command Modes	Privileged EXEC	
Usage Guidelines	N/A	
Examples	moxa# reload Are you sure you want to restart the device? [y/N] y Restarting device...	
Error Messages	N/A	
Related Commands	N/A	

## Reset to Default

### Reset to Default

#### Commands

##### reload factory default

Syntax Description	<b>reload</b>	Perform a warm restart
	<b>factory-default</b>	Perform a warm restart and restore the factory default settings
Defaults	N/A	
Command Modes	Privileged EXEC	
Usage Guidelines	N/A	
Examples	moxa# reload factory-default Would you like to reset system configuration to factory default? [y/N] y Resetting device into factory default and restarting...	
Error Messages	N/A	
Related Commands	N/A	

## Logout

#### Commands

##### exit

Syntax Description	<b>exit</b>	Log out from the device
Defaults	N/A	
Command Modes	Privileged EXEC	
Usage Guidelines	N/A	
Examples	moxa# exit	
Error messages	N/A	
Related commands	N/A	

## tech-support system [enable | disable]

Syntax Description	<b>tech-support</b>	Troubleshooting command. If remote technical support is necessary, an administrator can generate a one-time password for the special account 'tech-support'. An administrator should deliver the password offline by using a secure email account or phone. The automatically generated password will expire once the function is disabled, or the device reboots, to ensure the security of the device. Always remember to disable the command once the troubleshooting has been completed.
	<b>system</b>	Switch system
Defaults	Disable	
Command Modes	Privileged EXEC	
Usage Guidelines	N/A	
Examples	moxa# tech-support system enable Warning! The Telnet/HTTP service will be disabled. Account Name: moxasupport Account Password: nZParGhefA	

Error messages	"% Error! tech-support system hasn't yet been enabled." "% Account: Invalid: Max user account amount reached."
Warning messages	"Warning! The Telnet/HTTP service will be disabled." "Please save config to eliminate the account, moxasupport, from the system."
Related commands	tech-support system login

## tech-support system login

Syntax Description	<b>tech-support</b>	We strongly recommend using HTTPS or SSH instead of HTTP or Telnet for troubleshooting to help avoid man-in-the middle attacks whereby the attacker can access the one-time-used password. Technical support engineers can remotely log in to the device by using the account 'tech-support' and the one-time password generated by 'tech-support system enable'.
	<b>system</b>	Switch system internal
	<b>login</b>	Enter into linux shell
Defaults	N/A	
Command Modes	Privileged EXEC	
Usage Guidelines	N/A	
Examples	moxa# tech-support system login CLI console locked Enter Password to unlock the console: #	
Error messages	"% Error! tech-support system hasn't yet been enabled."	
Warning messages	N/A	
Related commands	tech-support system enable	