

# Moxa Managed Switch Next-generation OS (v4.x) Layer 2 Command Line Interface

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

**Models covered by this user manual:**

EDS-4000 Series Managed Ethernet Switches  
EDS-G4000 Series Managed Ethernet Switches  
MDS-G4000 Series Managed Ethernet Switches  
MDS-G4000-L3 Series Managed Ethernet Switches  
MDS-G4000-4XGS Series Managed Ethernet Switches  
MDS-G4000-L3-4XGS Series Managed Ethernet Switches  
RKS-G4000 Series Managed Ethernet Switches



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# **Moxa Managed Switch Next-generation OS (v4.x) Layer 2 Command Line Interface**

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# 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

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

### 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.

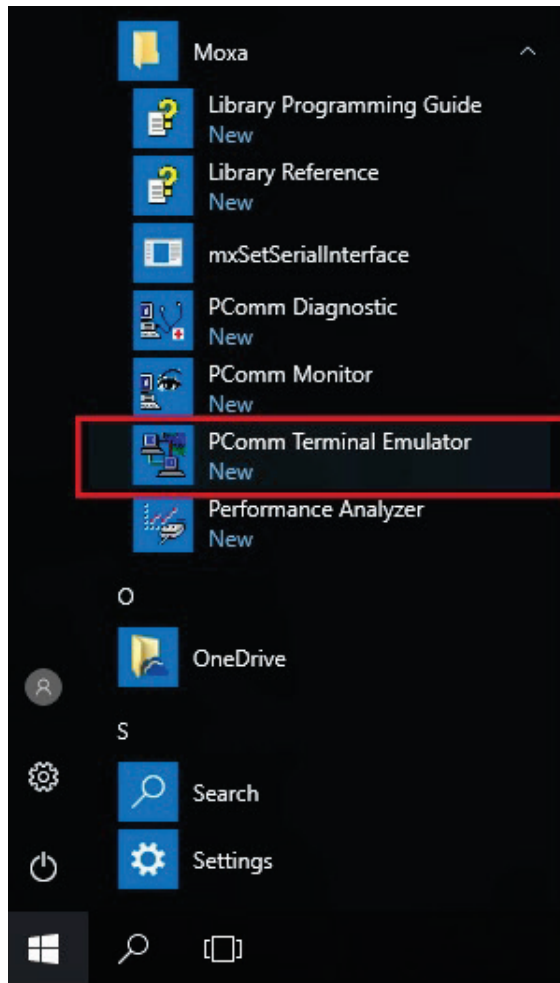


#### NOTE

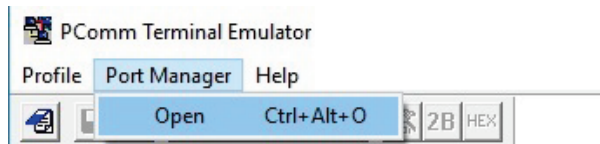
Moxa recommends using PComm Terminal Emulator for serial communication. This software is available for free on the Moxa website. You can use other serial communication software, but the following instructions may be different.

1. Use the RS-232 serial cable with RJ45 interface that is included with the switch.
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.

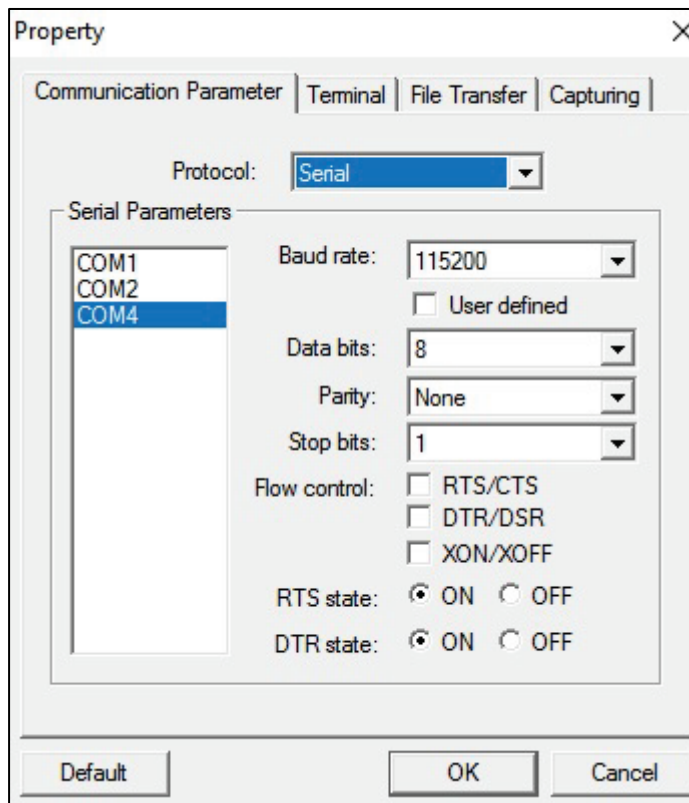
4. In Windows, click **Start > Moxa > PComm Terminal Emulator**.



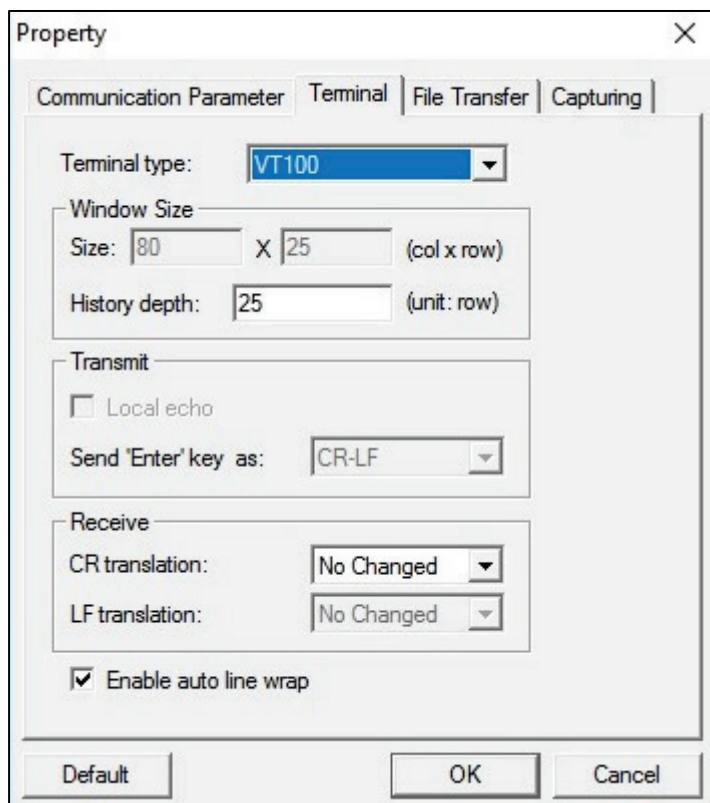
5. Click **Port Manager > Open** to establish a new connection.  
The Property window will appear.



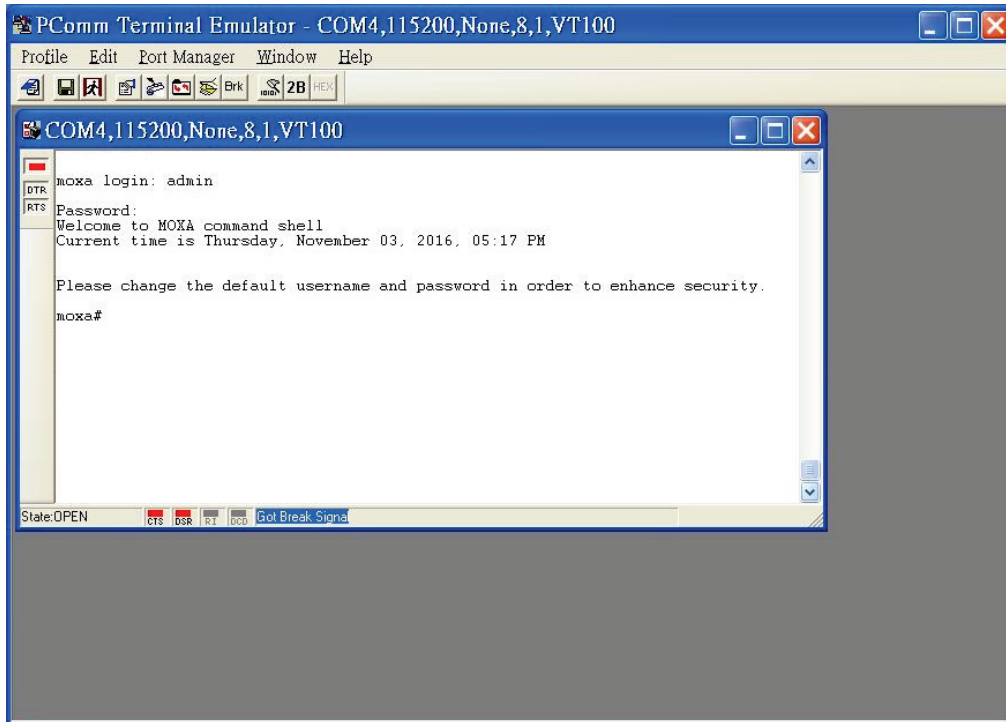
- On the **Communication Parameter** tab, select the COM port that will be used for the console connection. Configure the fields as follows: **115200** for **Baud rate**, **8** for **Data bits**, **None** for **Parity**, and **1** for **Stop bits**.



- 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 change 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 of the form 192.168.127.xxx and a subnet mask of 255.255.255.0.



## NOTE

When connecting to the Moxa switch 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.



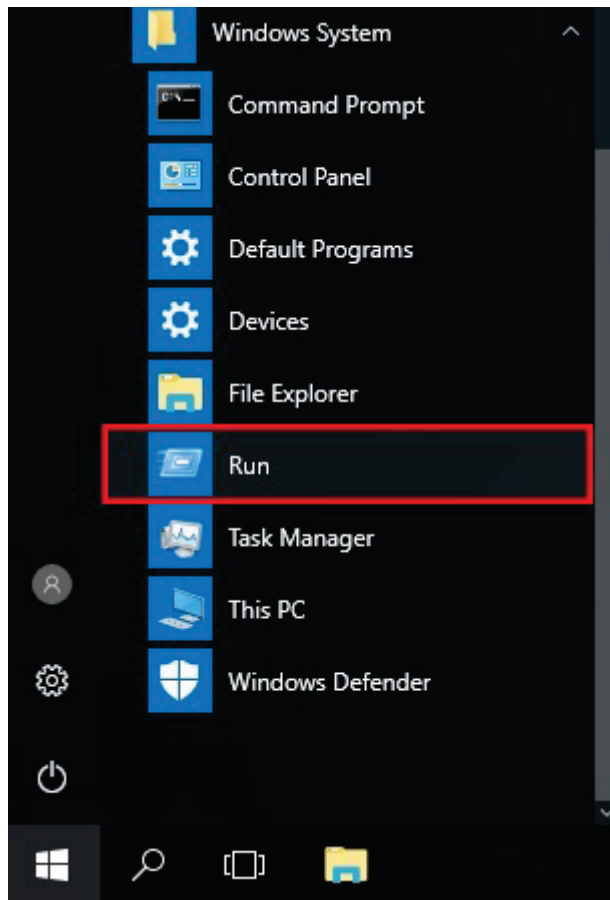
## NOTE

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

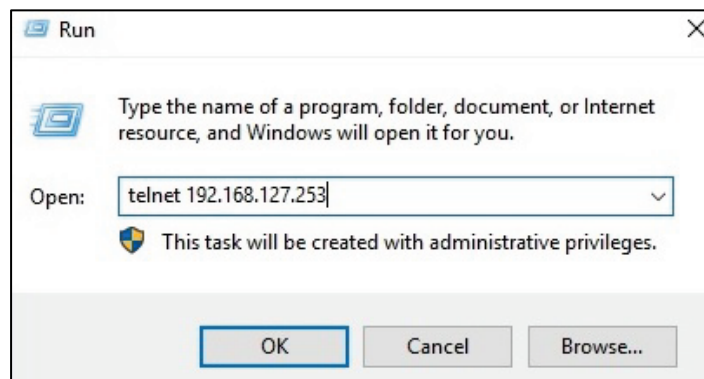


After making sure that the Moxa switch is connected to the same LAN and logical subnet as your PC, open the Moxa switch's Telnet console as follows:

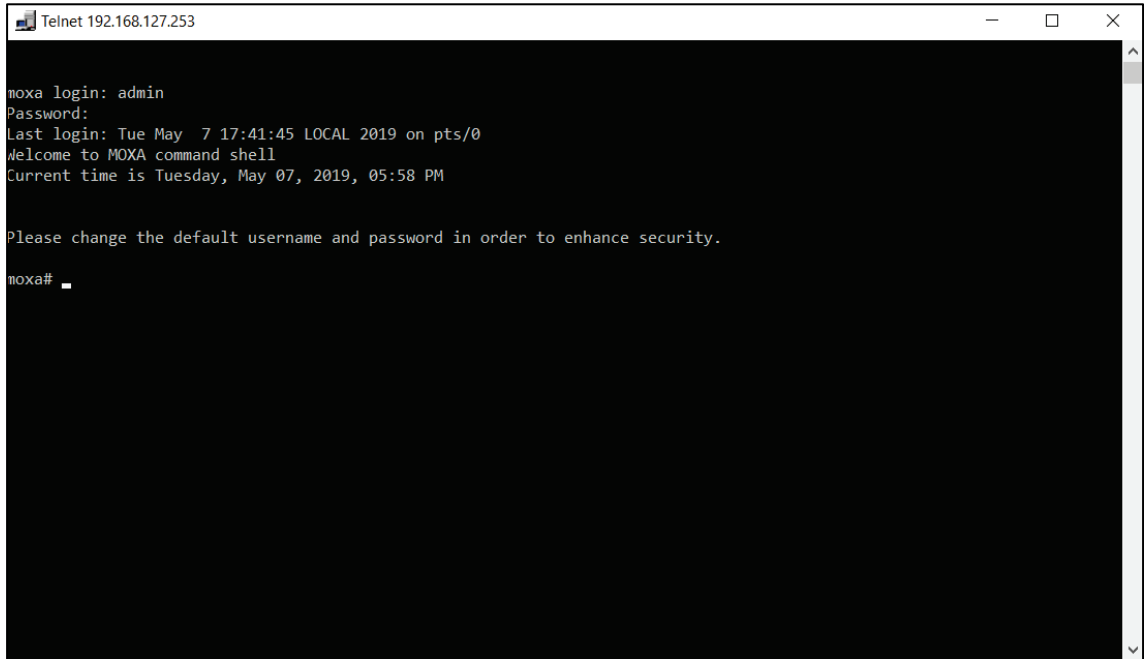
10. In Windows, click **Start > Run**.



11. 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.



12. 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).



```
Telnet 192.168.127.253
moxa login: admin
Password:
Last login: Tue May  7 17:41:45 LOCAL 2019 on pts/0
Welcome to MOXA command shell
Current time is Tuesday, May 07, 2019, 05:58 PM

Please change the default username and password in order to enhance security.
moxa#
```

13. 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 by an interface identification.	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.

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, if you 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> <interface-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>@server/filename} [included-default] [password <string(60)>]
copy startup-config {tftp://server/filename | sftp://<user-name>:<pass-word>@server/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.

# 3. Commands

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

## System

### System Management

#### Information Setting

##### Configure Device Hostname

###### Commands

**hostname** device-name

**no hostname**

<b>Syntax Description</b>	<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
<b>Defaults</b>	hostname: moxa	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# configure terminal moxa(config)# hostname device-name device-name(config)# no hostname moxa(config)#	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

##### Configure Device Description

###### Commands

**description** text

**no description**

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# configure terminal moxa(config)# description "description data" moxa(config)# no description	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	



## Configure Contact Information

### Commands

**contact** text

**no contact**

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# configure terminal moxa(config)# contact "contact info" moxa(config)# no contact	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Show Location Information

### Commands

**location** text

**no location**

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# configure terminal moxa(config)# location "location info" moxa(config)# no location	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Show System Information

### Commands

#### show system information

<b>Syntax Description</b>	<b>show</b>	Display configuration/status information
	<b>system</b>	Display system information
	<b>information</b>	Display system information
<b>Defaults</b>	N/A	
<b>Command Modes</b>	User EXEC Privileged EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<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>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Firmware Upgrade

### Upgrade the Firmware

#### Commands

**copy { <tftp\_url> | <sftp\_url> | **usb**: <filename> | **micro-sd**: <filename> } **device-firmware****

<b>Syntax Description</b>	<b>copy</b>	Perform copy operation
	<b>device-firmware</b>	Copy a device firmware file
	tftp_url	Specify the remote TFTP server address in the format "tftp://server/filename"
	sftp_url	Specify the remote SFTP server address in the format "sftp://username:password@server/filename"
	<b>usb</b>	Copy from an ABC-02 USB device under the /Moxa folder.
	<b>micro-sd</b>	Copy from a microSD device under the /Moxa folder.
<b>filename</b>	Specify the filename	
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<pre>(config)# copy tftp://server/"filename" device-firmware (config)# copy sftp://username:password@server/"filename" device-firmware (config)# copy usb:"filename" device-firmware (config)# copy micro-sd:"filename" device-firmware</pre>	
<b>Error messages</b>	<pre>Invalid: Firmware verify failed Invalid: Invalid Request Data Invalid: File expects [0-9], [a-z], [A-Z], and -._() Invalid: Not support USB. Invalid: Not support microSD. Invalid: USB function is disable Invalid: MicroSD function is disable</pre>	

<b>Related commands</b>	N/A
-------------------------	-----

## Configuration Backup and Restore

### Copy Running Configuration

#### Commands

**copy running-config** { <tftp\_url> | <sftp\_url> | **usb:** <filename> | **micro-sd:** <filename> }

**copy** { <tftp\_url> | <sftp\_url> | **usb:** <filename> | **micro-sd:** <filename> } **running-config**

<b>Syntax Description</b>	<b>copy</b>	Copies the configuration or system logs
	<b>running-config</b>	running-config to be copied
	tftp_url	File in remote location to be copied
	sftp_url	File in remote location to be copied
	<b>usb</b>	File in ABC-02 under /Moxa/config to be copied
	<b>micro-sd</b>	File in micro-SD under /Moxa/config to be copied
	filename	File name
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	(config)# copy running-config tftp://server/"filename" (config)# copy running-config sftp://username:password@server/"filename" (config)# copy running-config usb: "filename" (config)# copy running-config micro-sd: "filename"  (config)# copy tftp://server/"filename" running-config (config)# copy sftp://username:password@server/"filename" running-config (config)# copy usb: "filename" running-config (config)# copy micro-sd: "filename" running-config	
<b>Error messages</b>	Invalid: File expects [0-9], [a-z], [A-Z], and -_() Invalid: Not support USB. Invalid: Not support microSD. Invalid: USB function is disable Invalid: MicroSD function is disable Invalid: USB configuration import failed Invalid: MicroSD configuration import failed	
<b>Related commands</b>	copy startup-config { <tftp_url>   <sftp_url>   usb: <filename>   micro-sd: <filename> } config-file encryption password <password> show config-file encryption show customer-key info copy customer-key {<tftp_url>   <sftp_url>} private {<tftp_url>   <sftp_url>} certificate label <name> clear customer-key signed-config {enable   disable}	

### Copy Startup Configuration

#### Commands

**copy startup-config** { <tftp\_url> | <sftp\_url> | **usb:** <filename> | **micro-sd:** <filename> }

<b>Syntax Description</b>	<b>copy</b>	Perform copy operation
	<b>startup-config</b>	Copy the startup configuration
	tftp_url	Specify the remote TFTP server address in the format "tftp://server/filename"

	sftp_url	Specify the remote SFTP server address in the format "sftp://username:password@server/filename"
	usb	Copy from an ABC-02 USB device under the /Moxa folder.
	micro-sd	Copy from a microSD device under the /Moxa folder.
	filename	Specify the filename
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<pre>(config)# copy startup-config tftp://server/"filename" (config)# copy startup-config sftp://username:password@server/"filename" (config)# copy startup-config usb: "filename" (config)# copy startup-config micro-sd: "filename"</pre>	
<b>Error messages</b>	Invalid: File expects [0-9], [a-z], [A-Z], and -_() Invalid: Not support USB. Invalid: Not support microSD. Invalid: USB function is disable Invalid: microSD function is disable Invalid: USB configuration import failed Invalid: microSD configuration import failed	
<b>Related commands</b>	copy running-config { <tftp_url>   <sftp_url>   usb: <filename>   micro-sd: <filename> } config-file encryption password <password> show config-file encryption show customer-key info copy customer-key { <tftp_url>   <sftp_url> } private { <tftp_url>   <sftp_url> } certificate label <name> clear customer-key signed-config {enable   disable}	

## File Encryption

### Configure File Encryption Password

#### Commands

**config-file encryption password** <password>

**no config-file encryption**

<b>Syntax Description</b>	<b>config-file</b>	Configure configuration file-related settings
	<b>encryption</b>	Configure configuration file encryption
	<b>password</b>	Configure the configuration file password
	<password>	Specify the encryption password
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	(config)# config-file encryption password 1234	
<b>Error messages</b>	N/A	
<b>Related commands</b>	copy running-config { <tftp_url>   <sftp_url>   usb: <filename>   micro-sd: <filename> }	

	<pre>copy startup-config { &lt;tftp_url&gt;   &lt;sftp_url&gt;   usb: &lt;filename&gt;   micro-sd: &lt;filename&gt; } show config-file encryption show customer-key info copy customer-key {&lt;tftp_url&gt;   &lt;sftp_url&gt;} private {&lt;tftp_url&gt;   &lt;sftp_url&gt;} certificate label &lt;name&gt; clear customer-key signed-config {enable   disable}</pre>
--	---

## Show Configuration File Encryption Information

### Commands

**show config-file encryption**

<b>Commands</b>	<b>show</b>	Display running information for the function
	<b>config-file</b>	Display configuration file-related information
	<b>encryption</b>	Display the configuration file encryption information
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	# show config-file encryption	
<b>Error messages</b>	N/A	
<b>Related commands</b>	<pre>copy running-config { &lt;tftp_url&gt;   &lt;sftp_url&gt;   usb: &lt;filename&gt;   micro-sd: &lt;filename&gt; } copy startup-config { &lt;tftp_url&gt;   &lt;sftp_url&gt;   usb: &lt;filename&gt;   micro-sd: &lt;filename&gt; } config-file encryption password &lt;password&gt; show customer-key info copy customer-key {&lt;tftp_url&gt;   &lt;sftp_url&gt;} private {&lt;tftp_url&gt; &lt;sftp_url&gt;} certificate label &lt;name&gt; clear customer-key signed-config {enable   disable}</pre>	

## Event Log Backup

### Commands

**copy event-log** { <tftp\_url> | <sftp\_url> | **usb**: <filename> | **micro-sd**: <filename> }

<b>Syntax Description</b>	<b>copy</b>	Perform copy operation
	<b>event-log</b>	Copy the system event log
	tftp_url	Specify the remote TFTP server address in the format "tftp://server/filename"
	sftp_url	Specify the remote SFTP server address in the format "sftp://username:password@server/filename"
	<b>usb</b>	Copy from an ABC-02 USB device under the /Moxa folder.
	<b>micro-sd</b>	Copy from a microSD device under the /Moxa folder.
	filename	Specify the filename
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<pre>(config)# copy event-log tftp://server/moxa.log (config)# copy event-log sftp://username:password@server/moxa.log (config)# copy event-log usb: Moxa/log/moxa.log (config)# copy event-log micro-sd: Moxa/log/moxa.log</pre>	

<b>Error messages</b>	Invalid: File expects [0-9], [a-z], [A-Z], and -._() Invalid: Not support USB. Invalid: Not support microSD. Invalid: USB function is disable Invalid: MicroSD function is disable Invalid: Invalid Request Data
<b>Related commands</b>	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

<b>Syntax Description</b>	<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
<b>email</b>	Configures the user email	
email	The user's email address	
<b>Defaults</b>	N/A.	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	(config)# username testuser password test123 group admin status enable email test@test.com	
<b>Error Messages</b>	% 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	
<b>Related Commands</b>	Show user	

## Show User Information

### Commands

show user

<b>Syntax Description</b>	<b>show</b>	Display running information for the function
	<b>user</b>	Display user parameters
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global configuration/ User EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<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>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	username	

## Password Policy

### Configure Password Maximum Lifetime

#### Commands

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

<b>Syntax Description</b>	<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
<b>Defaults</b>	0	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<pre>moxa# config moxa(config)# password max-life-time 30 moxa(config)# password max-life-time</pre>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	show password max-life-time	

### Configure Password Validation Rules

#### Commands

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

<b>Syntax Description</b>	<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
<b>Defaults</b>	There are no validation rules configured by default	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<pre>moxa# config moxa(config)# password validate-rules lowercase numbers moxa(config)# password validate-rules</pre>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	show password validate-rules	

## Configure Password Minimum Length

### Commands

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

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

## Show Password Minimum Length

### Commands

**show minimum password minimum-length**

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# show password minimum-length 8	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	password minimum-length	

## Show Password Validation Rules

### Commands

**show password validate-rules**

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



## Online Account

### Show System Online Account

#### Commands

**show system online-account**

<b>Syntax Description</b>	<b>show</b>	Display running information for the function
	<b>system</b>	Display system related information
	<b>online-account</b>	Accounts already logged into this device
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privilege EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# show system online-account  Online Account ----- Account    Role    IP Address    Interface    ID    Idle Admin    Admin    192.168.127.253    HTTP(S)    4a5d6d51    1 Chris    Supervisor    192.168.127.252    HTTP(S)    19ad4348    10 User    User    192.168.127.251    Telnet    86ac3734    20 Jason    User    192.168.127.250    SSH    5c73d2a2    30 Tim    User    Local    Console    5c73d2a2    50	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

### Remove System Online Account

#### Commands

**remove system online-account id <id>**

<b>Syntax Description</b>	<b>remove</b>	Remove an online account
	<b>system</b>	Display system related information
	<b>online-account</b>	Accounts already logged into this device
	<b>id</b>	Login account ID in the table
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privilege EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# remove system online-account id 1a2b3c4d	
<b>Error Messages</b>	This ID is not valid.	
<b>Related Commands</b>	N/A	

# Network

## IP Configuration

### Configure IP Management Address

#### Commands

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

<b>Syntax Description</b>	<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
	dhcp	Assign the IPv4 address by DHCP
	ipv4-address	The IPv4 address
	ipv4-netmask	The IPv4 subnet mask
	ipv4-gateway	The IPv4 gateway
<b>Defaults</b>	ipv4-address: 192.168.127.253 ipv4-netmask: 255.255.255.0 ipv4-gateway: 0.0.0.0	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	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	
<b>Error Messages</b>	Invalid: Invalid IPv4 Management Address ipv4-address/ipv4-netmask. Invalid: Gateway ipv4-gateway is not reachable.	
<b>Related Commands</b>	N/A	

## DHCP Server

### Show IP DHCP

#### Commands

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

<b>Syntax Description</b>	<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
	<b>Defaults</b>	N/A
<b>Command Modes</b>	User EXEC Privileged EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	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 :	

	<pre> 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    : 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>
<b>Error Messages</b>	N/A
<b>Related Commands</b>	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**

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	Moxa(config)# dhcp-server mode disable	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Enable/Disable IP DHCP Pool

### Commands

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

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# ip dhcp pool 1 enable moxa(dhcp-config)#	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Remove IP DHCP Pool

### Commands

**no ip dhcp pool** <integer>

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# no ip dhcp pool 1	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Enable/Disable IP DHCP Static Pool

### Commands

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

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# ip dhcp static pool host1 enable moxa(dhcp-config)#	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Remove IP DHCP Static Pool

### Commands

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

<b>Syntax Description</b>	<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)
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# no ip dhcp static pool host1	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

# DHCP and MAC-based IP Assignment

## Configure DHCP Server Pool

### Commands

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

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

## Configure DHCP Server Host IP Address

### Commands

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

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

## Configure DHCP Server Host MAC Address

### Commands

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

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

## Configure Lease Time

### Commands

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

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

## Reset Lease time

### Commands

**no lease**

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

## Configure Default Router IP Address

### Commands

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

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

## Remove Default Router IP Address

### Commands

**no default-router**

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

## Configure DNS Server IP Address

### Commands

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

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

## Remove DNS Server IP Address

### Commands

**no dns-server**

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



## Configure NTP Server IP Address

### Commands

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

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

## Remove NPT Server IP Address

### Commands

**no ntp-server**

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

## Configure Port-based IP Assignment

### Commands

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

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC Interface Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# interface ethernet 1/2 moxa(config-if)# ip dhcp port-based-ip-assignment 192.168.127.100 255.255.255.0	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Remove Port-based IP Assignment

### Commands

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

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC Interface Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# interface ethernet 1/2 moxa(config-if)# no ip dhcp port-based-ip-assignment	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Enable/Disable Port-based IP Assignment

### Commands

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

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC Interface Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	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	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	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> } }

<b>Syntax Description</b>	<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 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	
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC Interface Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	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	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Remove Port-based IP Assignment Parameters

### Commands

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

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC Interface Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	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	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## DHCP Relay Agent

### Display IP DHCP Relay Configurations

#### Commands

##### show ip dhcp relay

<b>Syntax Description</b>	<b>show</b>	Display configuration/statistics information
	<b>ip</b>	Display the IP-related configuration
	<b>dhcp</b>	Display the DHCP-related configuration
	<b>relay</b>	Display the DHCP Relay configuration
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC/ User EXEC	
<b>Usage Guidelines</b>	Use this command to show the DHCP relay configuration details.	
<b>Examples</b>	<pre>moxa# show ip dhcp relay  Dhcp Relay   : Enabled  DHCP server 1 : 192.168.127.100 DHCP server 2 : 192.168.127.200 DHCP server 3 : DHCP server 4 :  DHCP Relay Option 82 : Remote ID type   : IP Remote ID value  : 192.168.127.200 Remote ID display : C0A87FC8  The number of packets that Option 82 has been inserted in : 0 The number of packets that have been dropped : 0 The number of packets that Option 82 could not be inserted in : 0  Interface Relay   Trusted   Option 82 ----- Eth1/1  Disabled Untrusted Disabled Eth1/2  Disabled Untrusted Disabled Eth1/3  Disabled Untrusted Disabled Eth1/4  Enabled  Trusted   Enabled Eth1/5  Disabled Untrusted Disabled</pre>	
<b>Error messages</b>	N/A	
<b>Related commands</b>	N/A	

### Clear IP DHCP Relay Statistics

#### Commands

##### clear ip dhcp relay statistics

<b>Syntax Description</b>	<b>clear</b>	Clear statistics information
	<b>ip</b>	Clear IP-related information
	<b>dhcp</b>	Clear DHCP-related information
	<b>relay</b>	Clear DHCP relay-related information
	<b>statistic</b>	Clear the DHCP relay statistics
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC/ User EXEC	
<b>Usage Guidelines</b>	Use this command to clear the DHCP relay statistics counters	
<b>Examples</b>	<pre>moxa# clear ip dhcp relay statistics</pre>	
<b>Error messages</b>	N/A	

<b>Related commands</b>	N/A
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## Enable/Disable DHCP Relay Global Status

### Commands

**ip dhcp relay** {enable | disable}

<b>Syntax Description</b>	<b>ip</b>	Configure IP-related parameters
	<b>dhcp</b>	Configure DHCP-related parameters
	<b>relay</b>	Configure DHCP relay parameters
	enable	Enable the global DHCP relay
	disable	Disable the global DHCP relay
<b>Defaults</b>	Disable	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	Use this command to enable or disable the global DHCP relay	
<b>Examples</b>	moxa(config)# ip dhcp relay enable	
<b>Error messages</b>	N/A	
<b>Related commands</b>	N/A	

## Configure the DHCP Relay Server

### Commands

**ip dhcp relay server** <server-index> <ucast\_addr>

**no ip dhcp relay server** <server-index>

<b>Syntax Description</b>	<b>ip</b>	Configure IP-related parameters
	<b>dhcp</b>	Configure DHCP-related parameters
	<b>relay</b>	Configure DHCP relay parameters
	<b>server</b>	Configure DHCP relay server parameters
	<server-index>	Specify the DHCP server address index (1-4)
	<ucast_addr>	Specify the IP address of the DHCP server to which the packets are to be forwarded
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	Use this command to specify the IP address of the DHCP server to which the packets are to be forwarded. To remove the DHCP relay server address, use the no form of this command.	
<b>Examples</b>	moxa(config)# ip dhcp relay server 1 192.168.127.100	
<b>Error messages</b>	N/A	
<b>Related commands</b>	N/A	

## Configure the DHCP Relay Interface Status

### Commands

**ip dhcp relay**

**no ip dhcp relay**

<b>Syntax Description</b>	<b>ip</b>	Configure IP-related parameters
	<b>dhcp</b>	Configure DHCP-related parameters
	<b>relay</b>	Configure DHCP relay interface parameters
<b>Defaults</b>	Disable	
<b>Command Modes</b>	Interface Configuration	
<b>Usage Guidelines</b>	Use this command to enable the DHCP relay interface. To disable the DHCP relay interface, use the no form of this command.	
<b>Examples</b>	moxa(config-if)# ip dhcp relay	

<b>Error messages</b>	N/A
<b>Related commands</b>	N/A

## Configure the DHCP Relay Trust Mode

### Commands

**ip dhcp relay trust**

**no ip dhcp relay trust**

<b>Syntax Description</b>	<b>ip</b>	Configure IP-related parameters
	<b>dhcp</b>	Configure DHCP-related parameters
	<b>relay</b>	Configure DHCP relay parameters
	<b>trust</b>	Configure the DHCP relay trust mode
<b>Defaults</b>	Untrust	
<b>Command Modes</b>	Interface Configuration	
<b>Usage Guidelines</b>	If the interface is in untrusted mode, it will drop any DHCP packets with Option 82 information or DHCP packets with a non-zero GIAddr received from untrust sources. In trusted mode, the interface will accept all DHCP packets.	
<b>Examples</b>	moxa(config-if)# ip dhcp relay trust	
<b>Error messages</b>	N/A	
<b>Related commands</b>	N/A	

## DHCP Relay Agent Option82

### Display IP DHCP Relay Configurations

#### Commands

**show ip dhcp relay**

<b>Syntax Description</b>	<b>show</b>	Display configuration/statistics information
	<b>ip</b>	Display the IP-related configuration
	<b>dhcp</b>	Display the DHCP-related configuration
	<b>relay</b>	Display the DHCP Relay configuration
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC/ User EXEC	
<b>Usage Guidelines</b>	Use this command to display the DHCP relay configuration details.	
<b>Examples</b>	<pre>moxa# show ip dhcp relay  Dhcp Relay   : Enabled  DHCP server 1 : 192.168.127.100 DHCP server 2 : 192.168.127.200 DHCP server 3 : DHCP server 4 :  DHCP Relay Option 82 : Remote ID type   : IP Remote ID value  : 192.168.127.200 Remote ID display : C0A87FC8  The number of packets that Option 82 has been inserted in : 0 The number of packets that have been dropped : 0 The number of packets that Option 82 could not be inserted in : 0  Interface Relay   Trusted   Option 82 -----</pre>	

	Eth1/1	Disabled	Untrusted	Disabled
	Eth1/2	Disabled	Untrusted	Disabled
	Eth1/3	Disabled	Untrusted	Disabled
	Eth1/4	Enabled	Trusted	Enabled
	Eth1/5	Disabled	Untrusted	Disabled
<b>Error messages</b>	N/A			
<b>Related commands</b>	N/A			

## Configure the DHCP Relay Option 82 Remote ID

### Commands

**ip dhcp relay option82 remote-id** {ip | mac | client-id | other <string(15)>}

<b>Syntax Description</b>	<b>ip</b>	Configure IP-related parameters
	<b>dhcp</b>	Configure DHCP-related parameters
	<b>relay</b>	Configure DHCP relay parameters
	<b>option82</b>	Configure DHCP Option 82 parameters
	<b>remote-id</b>	Configure the Option 82 remote ID
	ip	Specify the IP address of the switch
	mac	Specify the MAC address of the switch
	client-id	Specify the hostname of the switch
	other	Use a user-defined remote ID
	<string>	Specify the remote ID string (max 15 characters)
<b>Defaults</b>	The IP address of switch	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	Use this command to specify the Option 82 remote ID of the switch.	
<b>Examples</b>	moxa(config)# ip dhcp relay option82 remote-id mac moxa(config)# ip dhcp relay option82 remote-id other abcdef	
<b>Error messages</b>	N/A	
<b>Related commands</b>	N/A	

## Enable the DHCP Relay Option 82 Interface

### Commands

**ip dhcp relay option82**

**no ip dhcp relay option82**

<b>Syntax Description</b>	<b>ip</b>	Configure IP-related parameters
	<b>dhcp</b>	Configure DHCP-related parameters
	<b>relay</b>	Configure DHCP relay parameters
	<b>option82</b>	Configure the DHCP Option 82 interface status
<b>Defaults</b>	Disable	
<b>Command Modes</b>	Interface Configuration	
<b>Usage Guidelines</b>	Use this command to enable the DHCP relay to add Option 82 through the interface. To disable it, use the no form of this command.	
<b>Examples</b>	moxa(config-if)# ip dhcp relay option 82	
<b>Error messages</b>	N/A	
<b>Related commands</b>	N/A	

# 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	clock	
			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
<b>Defaults</b>		N/A	
<b>Command Modes</b>		Global Configuration	
<b>Usage Guidelines</b>		N/A	
<b>Examples</b>		moxa# configure terminal moxa(config)# clock timezone "8"	
<b>Error Messages</b>		N/A	



<b>Related Commands</b>	N/A
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## System Time

### Configure Clock Source

#### Commands

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

<b>Syntax Description</b>	<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)
<b>Defaults</b>	clock source: local	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# configure terminal moxa(config)# clock source local	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

### Configure Clock Setting

#### Commands

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

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# configure terminal moxa(config)# clock set 11:11:11 12 31 2019	
<b>Error Messages</b>	Invalid: Cannot modify clock time as the clock source is not Local	
<b>Related Commands</b>	N/A	

### Enable Clock Summer Time

#### Commands

**clock summer-time enable**

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

## Disable Clock Summertime

### Commands

#### clock summer-time disable

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

## Configure Clock Summertime Date

### Commands

**clock summer-time date** <started-month> <started-week> <started-day> <started-hour:started-minute> <ended-month> <ended-week> <ended-day> <ended-hour:ended-minute> [<offset>]

<b>Syntax Description</b>	<b>clock</b>	Configure system clock parameters
	<b>summer-time</b>	Configure Daylight Savings Time parameters
	<b>date</b>	Configure the date of Daylight Savings Time
	started-month	Specify the Daylight Saving Time starting month <integer (1-12)> (Jan (1) to Dec (12))
	started-week	Specify the Daylight Saving Time starting week (1st-last)
	started-day	Specify the Daylight Saving Time starting day <integer (1-7)> (Mon (1) to Sun (7))
	<started-hour:started-minute>	Specify the Daylight Saving Time starting day (Hour <00-24>, Minute <00-59>)
	ended-month	Specify the Daylight Saving Time ending month <integer (1-12)> (Jan (1) to Dec (12))
	ended-week	Specify the Daylight Saving Time ending week (1st-last)
	ended-day	Specify the Daylight Saving Time ending day <integer (1-7)> (Mon (1) to Sun (7))
	<ended-hour:ended-minute>	Specify the Daylight Saving Time ending day (Hour <00-24>, Minute <00-59>)
	offset	Specify the offset time (HH:mm <00:00-23:59>)
	<b>Defaults</b>	daylight saving time date: Mar last Sun 01:00 Oct last Sun 01:00 01:00
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# configure terminal moxa(config)# clock summer-time date Mar 2nd 02:00 Nov 1st Sun 02:00 01:00	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Configure NTP Authentication Key

### Commands

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

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

<b>Syntax Description</b>	<b>no</b>	Remove configuration/delete entry/reset to default value
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	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# configure terminal moxa(config)# ntp authentication-key 1 1 md5 1a2b3c4d moxa(config)# no ntp authentication-key 1	
<b>Error Messages</b>	Invalid: Authentication key ID key-id is duplicated.	
<b>Related Commands</b>	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 ]

<b>Syntax Description</b>	<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
<b>Defaults</b>	NTP time server: time.nist.gov	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	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	
<b>Error Messages</b>	Invalid: Authentication key ID key-id of NTP client server-index does not exist.	
<b>Related Commands</b>	N/A	

## Configure SNTP Remote Server

### Commands

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

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

<b>Syntax Description</b>	<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
<b>Defaults</b>	The default SNTP time server is set to time.nist.gov	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# configure terminal moxa(config)# ntp remote-server sntp 1 1.1.1.1 moxa(config)# no ntp remote-server sntp 1	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Enable NTP Server

### Commands

**ntp server enable**

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

## Disable NTP Server

### Commands

**ntp server disable**

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

## Configure NTP Server Authentication

### Commands

#### ntp server authentication

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

## Disable NTP Server Authentication

### Commands

#### no ntp server authentication

<b>Syntax Description</b>	<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
<b>Defaults</b>	NTP server authentication is disabled by default	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# configure terminal moxa(config)# no ntp server authentication	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Show Clock Information

### Commands

show clock

<b>Syntax Description</b>	<b>show</b>	Display configuration/status information
	<b>clock</b>	Display system clock information
<b>Defaults</b>	N/A	
<b>Command Modes</b>	User EXEC Privileged EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	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	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Show PTP Global Information/Status

### Commands

show ptp

<b>Syntax Description</b>	<b>show</b>	Display configuration/status information
	<b>ptp</b>	Display PTP information
<b>Defaults</b>	N/A	
<b>Command Modes</b>	User EXEC Privileged EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# show ptp PTP GLOBAL INFO: PTP Status : Enabled Current Profile : 1588v2 Default Profile Offset From Master(ns): -7.0 Mean Path Delay(ns) : 79 Steps Removed : 2 Sync. Status : Locked PTP Clock Time(TAI) : Wed Jan 01 01:09:20 2020	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Show IEEE1588 PTP Information/Status

### Commands

#### show ptp profile default

<b>Syntax Description</b>	<b>show</b>	Display configuration/status information
	<b>ptp</b>	Display PTP information
	<b>profile</b>	PTP profile selection
	<b>default</b>	1588v2 default profile
<b>Defaults</b>	N/A	
<b>Command Modes</b>	User EXEC Privileged EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<pre>moxa# show ptp profile default  1588v2 CLOCK DATA SET PTP Clock Type      : Peer-to-Peer Boundary Clock PTP Device Profile  : 1588v2 Default Profile Clock Identity      : 00:90:e8:ff:fe:d1:5a:53 Transport Type      : 802.3 Ethernet Clock Domain        : 0 Two-Step Flag       : True Number of PTP Ports : 28 Priority1            : 129 Priority2            : 128 Clock Quality:   Class              : 248   Accuracy           : 254 Offset From Master(ns): 2.0 Mean Path Delay(ns) : 8.0 Steps Removed       : 2 Maximum Steps Removed : 255 Slave Port          : 5 Sync. Status        : LOCKED Accuracy Alert(ns)  : 1000 PTP Clock Time(TAI) : Wed Jan 20 19:10:20 2021  1588v2 PARENT DATA SET Parent Clock:   Parent Clock Identity : 00:90:e8:ff:fe:71:1e:a5   Parent Port Number    : 10 Grandmaster Clock:   Grandmaster Clock Identity : 00:50:c2:ff:fe:c2:db:ad   Grandmaster Clock Quality:     Class              : 6     Accuracy           : 254     Priority1          : 10     Priority2          : 128</pre>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	show ptp profile default parent show ptp profile default clock	

## Show PTP Profile Default Clock

### Commands

**show ptp profile default clock**

<b>Syntax Description</b>	<b>show</b>	Display configuration/status information
	<b>ptp</b>	Display PTP information
	<b>profile</b>	PTP profile selection
	<b>default</b>	1588v2 default profile
	<b>clock</b>	Display clock information
<b>Defaults</b>	N/A	
<b>Command Modes</b>	User EXEC Privileged EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<pre> moxa# show ptp profile default clock  1588v2 CLOCK DATA SET   PTP Clock Type      : End-to-End Boundary Clock   PTP Device Profile  : 1588v2 Default Profile   Clock Identity      :   Transport Type      : 802.3 Ethernet   Clock Domain        : 0   Two-Step Flag       : True   Number of PTP Ports : 4   Priority1            : 128   Priority2            : 128   Clock Quality:     Class              : 248     Accuracy            : 254   Offset From Master(ns): 0   Mean Path Delay(ns) : 0   Steps Removed       : 0   Maximum Steps Removed: 254   Slave Port          :   Sync. Status        : Syncing   Accuracy Alert(ns)  : 1000   PTP Clock Time(TAI) : Wed Jan 01 00:00:00 2020  ##### ##### For Transparent moxa# show ptp profile default clock  1588v2 CLOCK DATA SET   PTP Clock Type      : End-to-End Transparent Clock   PTP Device Profile  : 1588v2 Default Profile   Clock Identity      :   Transport Type      : 802.3 Ethernet   Clock Domain        : 0   Two-Step Flag       : True   Number of PTP Ports : 4   Sync. Status        : Syncing   Accuracy Alert (ns) : 1000 </pre>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	show ptp profile default parent	



## Show PTP Profile Default Parent

### Commands

**show ptp profile default parent**

<b>Syntax Description</b>	<b>show</b>	Display configuration/status information
	<b>ptp</b>	Display PTP information
	<b>profile</b>	PTP profile selection
	<b>default</b>	1588v2 default profile
	<b>parent</b>	Display parent information
<b>Defaults</b>	N/A	
<b>Command Modes</b>	User EXEC Privileged EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<pre> moxa# show ptp profile default parent 1588v2 PARENT DATA SET Parent Clock:   Parent Clock Identity    : 0x70:C9:C6:FF:FE:96:34:80   Parent Port Number      : 1 Grandmaster Clock:   Grandmaster Clock Identity :   Grandmaster Clock Quality:     Class                  : 248     Accuracy                : 254     Priority1               : 246     Priority2               : 248 ##### ##### For Transparent moxa# show ptp profile default parent 1588v2 PARENT DATA SET </pre>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Show PTP Profile Default Port

### Commands

**show ptp profile default port** [<interface-type> <interface-id>]

<b>Syntax Description</b>	<b>show</b>	Display configuration/status information
	<b>ptp</b>	Display PTP information
	<b>profile</b>	PTP profile selection
	<b>default</b>	1588v2 default profile
	<b>port</b>	Display port information
	<interface-type>	Ethernet (interface-type)
	<interface-id>	Interface-id : <1-X>/<1-Y> slot number/port number
<b>Defaults</b>	N/A	
<b>Command Modes</b>	User EXEC Privileged EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<pre>moxa# show ptp profile default port Ethernet 1/1 1588v2 PORT DATA SET:   Port Identity          : 00:90:E8:FF:FE:11:22:40-1   Port State             : Master   Announce Interval(log) : 1   Announce Receipt Timeout : 3   Sync Interval(log)     : 0   Delay Req Interval(log) : 0   Pdelay Req Interval(log) : 0   Peer Mean Path Delay(ns) : 60  ##### ##### moxa# show ptp profile default port Ethernet 1/1 1588v2 PORT DATA SET:   Port Identity          : 00:90:E8:FF:FE:11:22:40-1   Pdelay Req Interval(log) : 0   Peer Mean Path Delay(ns) : 60</pre>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Enable/Disable PTP Service

### Commands

**ptp enable**

**ptp disable**

<b>Syntax Description</b>	<b>ptp</b>	Display PTP information
	<b>enable</b>	Enable PTP service
	<b>disable</b>	Disable PTP service
<b>Defaults</b>	Enabled	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<pre>moxa(config)# ptp enable moxa(config)# ptp disable</pre>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Configure PTP Global Settings

### Commands

**ptp profile default mode** {boundary | transparent} **delay-mechanism** {e2e | p2p}

<b>Syntax Description</b>	<b>ptp</b>	Configure PTP information
	<b>profile</b>	PTP profile selection
	<b>default</b>	1588v2 default profile
	<b>mode</b>	Mode related configuration of the PTP Clock
	boundary	PTP Clock is configured as boundary Clock
	transparent	PTP Clock is configured as transparent Clock
	<b>delay-mechanism</b>	Propagation delay mechanism configuration
	e2e	End-to-end delay mechanism is applied
	p2p	Peer-to-peer delay mechanism is applied
<b>Defaults</b>	End-to-End boundary clock	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# ptp profile default mode boundary delay-mechanism e2e	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Apply/Remove PTP Profile Default Priority1

### Commands

**ptp profile default priority1** <value>

**no ptp profile default priority1**

<b>Syntax Description</b>	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>ptp</b>	Display PTP information
	<b>profile</b>	PTP profile selection
	<b>default</b>	1588v2 default profile
	<b>priority1</b>	Configure the Priority1 parameters
	<value>	0-255
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# ptp profile default priority1 128 moxa(config)# no ptp profile default priority1	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Apply/Remove PTP Profile Default Priority2

### Commands

**ptp profile default priority2** <value>

**no ptp profile default priority2**

<b>Syntax Description</b>	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>ptp</b>	Display PTP information
	<b>profile</b>	PTP profile selection
	<b>default</b>	1588v2 default profile
	<b>priority2</b>	Configure the Priority2 parameters
	<value>	0-255
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# ptp profile default priority2 128 moxa(config)# no ptp profile default priority2	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Apply/Remove PTP Profile Default Domain

### Commands

**ptp profile default profile domain**<domain-number>

**no ptp profile default profile domain**

<b>Syntax Description</b>	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>ptp</b>	Display PTP information
	<b>profile</b>	PTP profile selection
	<b>default</b>	1588v2 default profile
	<b>domain</b>	PTP domain parameters
	<domain-number>	0-255
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# ptp profile default domain 0 moxa(config)# no ptp profile default domain	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Configure PTP Profile Default Network-transport Settings

### Commands

**ptp profile default network-transport** {ethernet | ipv4 }

<b>Syntax Description</b>	<b>ptp</b>	Display PTP information
	<b>profile</b>	PTP profile selection
	<b>default</b>	1588v2 default profile
	<b>network-transport</b>	Network transport type related configuration
	ethernet	L2 802.3 transport type
	ipv4	Internet Protocol version4 transport type
<b>Defaults</b>	802.3	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# ptp profile default network-transport 802.3	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Enable/Disable PTP Profile Default Two-Step Setting

### Commands

**ptp profile default two-step** {enable | disable}

<b>Syntax Description</b>	<b>ptp</b>	Configure PTP parameters
	<b>profile</b>	PTP profile selection
	<b>default</b>	1588v2 default profile
	<b>two-step</b>	Generate follow-up message for synchronization event messages
	enable	Enable Two-Step mode
	disable	Disable Two-Step mode
<b>Defaults</b>	Two-step enabled	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# ptp profile default two-step enable	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Apply/Remove PTP Profile Default Maximum-step-removed Setting

### Commands

**ptp profile default maximum-step-removed** <max step removed>

**no ptp profile default maximum-step-removed**

<b>Syntax Description</b>	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>ptp</b>	Configure PTP parameters
	<b>profile</b>	PTP profile selection
	<b>default</b>	1588v2 default profile
	<b>maximum-step-removed</b>	Configure maximum step removed for PTP
	254	
<b>Defaults</b>	254	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# ptp profile default maximum-step-removed 50	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Configure PTP Profile Default Accuracy-alert Setting

### Commands

**ptp profile default accuracy-alert** <nanosecond>

**no ptp profile default accuracy-alert**

<b>Syntax Description</b>	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>ptp</b>	Configure PTP parameters
	<b>profile</b>	PTP profile selection
	<b>default</b>	1588v2 default profile
	<b>accuracy-alert</b> <nanosecond>	Configure accuracy alert threshold for time synchronization status The value for the default accuracy alert
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# ptp profile default accuracy-alert 300	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Configure PTP Port Setting

### Commands

**ptp profile default**

**no ptp profile default**

<b>Syntax Description</b>	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>ptp</b>	Configure PTP parameters
	<b>profile</b>	PTP profile selection
	<b>default</b>	1588v2 default profile
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# interface Ethernet 1/1 /* Enable port ptp */ moxa(config-if)# ptp profile default /* Disable port ptp */ moxa(config-if)# no ptp profile default	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Configure PTP Profile Default Announcement Interval

### Commands

**ptp profile default announce interval** <value>

**no ptp profile default announce interval**

<b>Syntax Description</b>	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>ptp</b>	Configure PTP parameters
	<b>profile</b>	PTP profile selection
	<b>default</b>	1588v2 default profile
	<b>announce</b>	Configure the Announcement message
	<b>interval</b>	Configure the Announcement message interval
	<value>	Announcement: 0~4
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# interface Ethernet 1/1 moxa(config-if)# ptp profile default announce interval 0 moxa(config-if)# no ptp profile default announce interval	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Configure PTP Profile Default Synchronization Interval

### Commands

**ptp profile default sync interval** <value>

**no ptp profile default sync interval**

<b>Syntax Description</b>	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>ptp</b>	Configure PTP parameters
	<b>profile</b>	PTP profile selection
	<b>default</b>	1588v2 default profile
	<b>sync</b>	Configure the Synchronization message
	<b>interval</b>	Configure the Synchronization message interval
	<value>	Synchronization: -3~5
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# interface Ethernet 1/1 moxa(config-if)# ptp profile default sync interval -3 moxa(config-if)# no ptp profile default sync interval	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Configure PTP Profile Default Delay Request Interval

### Commands

**ptp profile default delay-req interval** <value>

**no ptp profile default delay-req interval**

<b>Syntax Description</b>	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>ptp</b>	Configure PTP parameters
	<b>profile</b>	PTP profile selection
	<b>default</b>	1588v2 default profile
	<b>delay-req</b>	Configure the Delay Request message
	<b>interval</b>	Configure the Delay Request message interval
	<value>	Delay Request: -3~5
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# interface Ethernet 1/1 moxa(config-if)# ptp profile default delay-req interval 0 moxa(config-if)# no ptp profile default delay-req interval	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Configure PTP Profile Default PDelay Request Interval

### Commands

**ptp profile default pdelay-req interval** <value>

**no ptp profile default pdelay-req interval**

<b>Syntax Description</b>	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>ptp</b>	Configure PTP parameters
	<b>profile</b>	PTP profile selection
	<b>default</b>	1588v2 default profile
	<b>pdelay-req</b>	Configure the PDelay Request message
	<b>interval</b>	Configure the PDelay Request message interval
	<value>	PDelay Request: -3~5
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# interface Ethernet 1/1 moxa(config-if)# ptp profile default pdelay-req interval 0 moxa(config-if)# no ptp profile default pdelay-req interval	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	



## Configure PTP Profile Default Announcement Timeout

### Commands

**ptp profile default announce timeout** <value>

**no ptp profile default announce timeout**

<b>Syntax Description</b>	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>ptp</b>	Configure PTP parameters
	<b>profile</b>	PTP profile selection
	<b>default</b>	1588v2 default profile
	<b>announce</b>	Configure the Announcement message
	<b>timeout</b>	Configure the Announcement receipt timeout
	<value>	Announcement: 2-10
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# interface Ethernet 1/1 moxa(config-if)# ptp profile default announce timeout 3 moxa(config-if)# no ptp profile default announce timeout	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Configure PTP Profile Default Delay Asymmetry

### Commands

**ptp profile default delay-asymmetry** 0

**no ptp profile default delay-asymmetry**

<b>Syntax Description</b>	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>ptp</b>	Configure PTP parameters
	<b>profile</b>	PTP profile selection
	<b>default</b>	1588v2 default profile
	<b>Delay-asymmetry</b>	Configure the Announcement message
		<value>
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# interface Ethernet 1/1 moxa(config-if)# ptp profile default delay-asymmetry 0 moxa(config-if)# no ptp profile default delay-asymmetry	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Show IEC 61850-9-3 2016 Profile Information

### Commands

**show ptp profile 61850-9-3**

<b>Syntax Description</b>	<b>ptp</b>	Display PTP information
	<b>profile</b>	Show PTP profile information
	<b>61850-9-3</b>	Show IEC 61850-9-3 2016 profile details
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC/ User EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<pre> moxa# show ptp profile 61850-9-3  1588v2 CLOCK DATA SET PTP Clock Type      : Peer-to-Peer Boundary Clock PTP Device Profile  : IEC 61850-9-3-2016 Clock Identity      : 00:90:e8:ff:fe:d1:5a:53 Transport Type      : 802.3 Ethernet Clock Domain        : 0 Two-Step Flag       : True Number of PTP Ports : 28 Priority1            : 129 Priority2            : 128 Clock Quality:   Class              : 248   Accuracy           : 254 Offset From Master(ns): 2.0 Mean Path Delay(ns) : 8.0 Steps Removed       : 2 Maximum Steps Removed : 255 Slave Port          : 5 Sync. Status        : LOCKED Accuracy Alert(ns)  : 1000 PTP Clock Time(TAI) : Wed Jan 20 19:10:20 2021  1588v2 PARENT DATA SET Parent Clock:   Parent Clock Identity : 00:90:e8:ff:fe:71:1e:a5   Parent Port Number    : 10 Grandmaster Clock:   Grandmaster Clock Identity : 00:50:c2:ff:fe:c2:db:ad   Grandmaster Clock Quality:     Class                : 6     Accuracy              : 254     Priority1             : 10     Priority2             : 128  ##### ##### For Transparent moxa# show ptp profile 61850-9-3  1588v2 CLOCK DATA SET PTP Clock Type      : Peer-to-Peer Transparent Clock PTP Device Profile  : IEC 61850-9-3-2016 Clock Identity      : 00:90:e8:ff:fe:d1:5a:53 Transport Type      : 802.3 Ethernet Clock Domain        : 0 Two-Step Flag       : True Number of PTP Ports : 4 Sync. Status        : Syncing </pre>	

	Accuracy Alert (ns) : 1000 1588v2 PARENT DATA SET No Parent Data Set in Transparent Clock
<b>Error messages</b>	N/A
<b>Related commands</b>	show ptp profile 61850-9-3 parent show ptp profile 61850-9-3 clock

## Show PTP Profile 61850-9-3 Clock Information

### Commands

**show ptp profile 61850-9-3 clock**

<b>Syntax Description</b>	<b>ptp</b>	Display PTP information
	<b>profile</b>	Show PTP profile information
	<b>61850-9-3</b>	Show IEC 61850-9-3 2016 profile details
	<b>clock</b>	Display the clock information
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC/ User EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<pre> moxa# show ptp profile 61850-9-3 clock  1588v2 CLOCK DATA SET PTP Clock Type      : Peer-to-Peer Boundary Clock PTP Device Profile  : IEC 61850-9-3-2016 Clock Identity      : 00:90:e8:ff:fe:d1:5a:53 Transport Type      : 802.3 Ethernet Clock Domain        : 0 Two-Step Flag       : True Number of PTP Ports : 28 Priority1            : 129 Priority2            : 128 Clock Quality:   Class              : 248   Accuracy            : 254 Offset From Master(ns): 2.0 Mean Path Delay(ns) : 8.0 Steps Removed       : 2 Maximum Steps Removed : 255 Slave Port           : 5 Sync. Status         : LOCKED Accuracy Alert(ns)   : 1000 PTP Clock Time(TAI) : Wed Jan 20 19:10:20 2021  ##### ##### For Transparent moxa# show ptp profile 61850-9-3 clock  1588v2 CLOCK DATA SET PTP Clock Type      : Peer-to-Peer Transparent Clock PTP Device Profile  : IEC 61850-9-3-2016 Clock Identity      : 00:90:e8:ff:fe:d1:5a:53 Transport Type      : 802.3 Ethernet Clock Domain        : 0 Two-Step Flag       : True Number of PTP Ports : 4 Sync. Status        : Syncing </pre>	

	Accuracy Alert (ns) : 1000
<b>Error messages</b>	N/A
<b>Related commands</b>	show ptp profile 61850-9-3 parent

## Show PTP Profile 61850-9-3 Parent Information

### Commands

**show ptp profile 61850-9-3 parent**

<b>Syntax Description</b>	<b>ptp</b>	Display PTP information
	<b>profile</b>	Show PTP profile information
	<b>61850-9-3</b>	Show IEC 61850-9-3 2016 profile details
	<b>parent</b>	Display parent information
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC/ User EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<pre> moxa# show ptp profile 61850-9-3 parent 1588v2 PARENT DATA SET Parent Clock:   Parent Clock Identity   : 70:c9:c6:ff:fe:96:34:80   Parent Port Number     : 1 Grandmaster Clock:   Grandmaster Clock Identity : 00:90:e8:ff:fe:d1:5a:53   Grandmaster Clock Quality:     Class                  : 248     Accuracy                : 254     Priority1               : 246     Priority2               : 248 ##### ##### For Transparent moxa# show ptp profile 61850-9-3 parent 1588v2 PARENT DATA SET No Parent Data Set in Transparent Clock </pre>	
<b>Error messages</b>	N/A	
<b>Related commands</b>	N/A	

## Show PTP Profile 61850-9-3 Port Information

### Commands

**show ptp profile 61850-9-3 port** [<interface-type> <interface-id>]

<b>Syntax Description</b>	<b>ptp</b>	Display PTP information
	<b>profile</b>	Show PTP profile information
	<b>61850-9-3</b>	Show IEC 61850-9-3 2016 profile details
	<b>port</b>	Display the port information
	<interface-type>	Specify the interface type (Ethernet)
	<interface-id>	Specify the interface ID in the format <1-X>/<1-Y> (Slot Number/Port Number)
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC/ User EXEC	
<b>Usage Guidelines</b>	N/A	

<b>Examples</b>	<pre> moxa# show ptp profile 61850-9-3 port Ethernet 1/1 1588v2 PORT DATA SET: Port Identity          : 00:90:e8:ff:fe:11:22:40-1 Port State             : Master Announce Interval(log) : 1 Announce Receipt Timeout : 3 Sync Interval(log)     : 0 Delay Req Interval(log) : 0 Pdelay Req Interval(log) : 0 Peer Mean Path Delay(ns) : 60  ##### ##### moxa# show ptp profile 61850-9-3 port Ethernet 1/1 1588v2 PORT DATA SET: Port Identity          : 00:90:e8:ff:fe:11:22:40-1 Port State             : TRANSMITTING_SYNCHRONIZED Pdelay Req Interval(log) : 0 Peer Mean Path Delay(ns) : 60 </pre>
<b>Error messages</b>	N/A
<b>Related commands</b>	N/A

## IEC 61850-9-3 2016 Profile Configuration

### Configure PTP Global Settings

#### Commands

**ptp profile 61850-9-3 mode** {boundary | transparent} delay-mechanism p2p}

<b>Syntax Description</b>	<b>ptp</b>	Configure PTP parameters
	<b>profile</b>	Configure a PTP profile
	<b>61850-9-3</b>	Configure IEC 61850-9-3 2016 profile parameters
	<b>mode</b>	Configure the PTP clock mode
	boundary	Set the PTP clock mode to Boundary Clock
	transparent	Set the PTP clock mode to Transparent Clock
	delay-mechanism	Configure the delay mechanism
	p2p	Apply the peer-to-peer delay mechanism
<b>Defaults</b>	Peer-to-peer boundary clock	
<b>Command Modes</b>	Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa (config)# ptp profile 61850-9-3 mode boundary delay-mechanism p2p	
<b>Error messages</b>	N/A	
<b>Related commands</b>	N/A	

### Configure PTP Profile 61850-9-3 Priority 1

#### Commands

**ptp profile 61850-9-3 priority1** <value>

### no ptp profile 61850-9-3 priority1

<b>Syntax Description</b>	<b>ptp</b>	Configure PTP parameters
	<b>profile</b>	Configure a PTP profile
	<b>61850-9-3</b>	Configure IEC 61850-9-3 2016 profile parameters
	<b>priority1</b>	Configure Priority 1 parameters
	<value>	Specify the priority (0-255)
<b>Defaults</b>	128	
<b>Command Modes</b>	Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa (config)# ptp profile 61850-9-3 priority1 128 moxa (config)# no ptp profile 61850-9-3 priority1	
<b>Error messages</b>	N/A	
<b>Related commands</b>	N/A	

## Configure PTP Profile 61850-9-3 Priority 2

### commands

**ptp profile 61850-9-3 priority2 <value>**

**no ptp profile 61850-9-3 priority2**

<b>Syntax Description</b>	<b>ptp</b>	Configure PTP parameters
	<b>profile</b>	Configure a PTP profile
	<b>61850-9-3</b>	Configure IEC 61850-9-3 2016 profile parameters
	<b>priority2</b>	Configure Priority 2 parameters
	<value>	Specify the priority (0-255)
<b>Defaults</b>	128	
<b>Command Modes</b>	Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa (config)# ptp profile 61850-9-3 priority2 128 moxa (config)# no ptp profile 61850-9-3 priority2	
<b>Error messages</b>	N/A	
<b>Related commands</b>	N/A	

## Configure the PTP Profile 61850-9-3 Domain Number

### commands

**ptp profile 61850-9-3 domain** <domain-number>

**no ptp profile 61850-9-3 domain**

<b>Syntax Description</b>	<b>ptp</b>	Configure PTP parameters
	<b>profile</b>	Configure a PTP profile
	<b>61850-9-3</b>	Configure IEC 61850-9-3 2016 profile parameters
	<b>domain</b>	Configure the PTP domain number
	<domain-number>	Specify the domain number (0-255)
<b>Defaults</b>	0	
<b>Command Modes</b>	Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa (config)# ptp profile 61850-9-3 domain 0	
<b>Error messages</b>	N/A	
<b>Related commands</b>	N/A	

## Enable/Disable PTP Profile 61850-9-3 Two-step Settings

### commands

**ptp profile 61850-9-3 two-step** enable

**ptp profile 61850-9-3 two-step** disable

<b>Syntax Description</b>	<b>ptp</b>	Configure PTP parameters
	<b>profile</b>	Configure a PTP profile
	<b>61850-9-3</b>	Configure IEC 61850-9-3 2016 profile parameters
	<b>two-step</b>	Configure the Two-step mode to generate follow-up message for synchronization event messages
	enable	Enable Two-step mode
	disable	Disable Two-step mode
<b>Defaults</b>	Enabled	
<b>Command Modes</b>	Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa (config)# ptp profile 61850-9-3 two-step enable moxa (config)# ptp profile 61850-9-3 two-step disable	
<b>Error messages</b>	N/A	
<b>Related commands</b>	N/A	

## Remove the PTP Profile 61850-9-3 Maximum Step

### commands

**ptp profile 61850-9-3 maximum-step-removed** <max step removed>

**no ptp profile 61850-9-3 maximum-step-removed**

<b>Syntax Description</b>	<b>ptp</b>	Configure PTP parameters
	<b>profile</b>	Configure a PTP profile
	<b>61850-9-3</b>	Configure IEC 61850-9-3 2016 profile parameters
	<b>max-step-removed</b>	Configure max steps removed parameters
	<maximum-step-removed>	Specify the maximum step removed for PTP (0-255)
<b>Defaults</b>	255	
<b>Command Modes</b>	Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa (config)# ptp profile 61850-9-3 maximum-step-removed 50	
<b>Error messages</b>	N/A	
<b>Related commands</b>	N/A	

## Configure PTP Profile 61850-9-3 Accuracy Alert Threshold

### commands

**ptp profile 61850-9-3 accuracy-alert** <nanosecond>

**no ptp profile 61850-9-3 accuracy-alert**

<b>Syntax Description</b>	<b>ptp</b>	Configure PTP parameters
	<b>profile</b>	Configure a PTP profile
	<b>61850-9-3</b>	Configure IEC 61850-9-3 2016 profile parameters
	<b>accuracy-alert</b>	Configure the accuracy alert threshold for Sync Status
	<nanosecond>	Specify the accuracy alert threshold in nanoseconds (50-250000000)
<b>Defaults</b>	1000	
<b>Command Modes</b>	Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa (config)# ptp profile 61850-9-3 accuracy-alert 300	
<b>Error messages</b>	N/A	
<b>Related commands</b>	N/A	



## Configure PTP Profile 61850-9-3 Port Settings

### Commands

**ptp profile 61850-9-3**

**no ptp profile 61850-9-3**

<b>Syntax Description</b>	<b>ptp</b>	Configure PTP parameters
	<b>profile</b>	Configure a PTP profile
	<b>61850-9-3</b>	Configure IEC 61850-9-3 2016 profile parameters
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<pre>moxa (config)# interface Ethernet 1/1 /* Enable port ptp */ moxa (config-if)# ptp profile 61850-9-3 %note: Profile setting will be applied to all ports. /* Disable port ptp */ moxa (config-if)# no ptp profile 61850-9-3</pre>	
<b>Error messages</b>	N/A	
<b>Related commands</b>	N/A	

## Show C37.238-2017 Profile Information

### Commands

**show ptp profile C37.238**

<b>Syntax Description</b>	<b>ptp</b>	Display PTP information
	<b>profile</b>	Show PTP profile information
	<b>c37.238</b>	Show C37.238-2017 profile details
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC/ User EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<pre>moxa# show ptp profile c37.238  1588v2 CLOCK DATA SET PTP Clock Type      : Peer-to-Peer Boundary Clock PTP Device Profile  : IEEE C37.238-2017 Clock Identity      : 00:90:e8:ff:fe:d1:5a:53 Transport Type      : 802.3 Ethernet Clock Domain        : 0 Two-Step Flag       : True Number of PTP Ports : 28 Priority1            : 129 Priority2            : 128 Clock Quality:   Class              : 248   Accuracy            : 254 Offset From Master(ns): 2.0 Mean Path Delay(ns) : 8.0 Steps Removed       : 2 Maximum Steps Removed : 255 Slave Port           : 5 Sync. Status         : LOCKED Accuracy Alert(ns)   : 1000 PTP Clock Time(TAI) : Wed Jan 20 19:10:20 2021  1588v2 PARENT DATA SET Parent Clock:</pre>	

	<pre> Parent Clock Identity   : 00:90:e8:ff:fe:71:1e:a5 Parent Port Number     : 10 Grandmaster Clock: Grandmaster Clock Identity : 00:50:c2:ff:fe:c2:db:ad Grandmaster Clock Quality: Class                  : 6 Accuracy                : 254 Priority1               : 10 Priority2               : 128 ##### ##### For Transparent moxa# show ptp profile c37.238  1588v2 CLOCK DATA SET PTP Clock Type        : Peer-to-Peer Transparent Clock PTP Device Profile    : IEEE C37.238-2017 Clock Identity        : 00:90:e8:ff:fe:d1:5a:53 Transport Type        : 802.3 Ethernet Clock Domain          : 0 Two-Step Flag         : True Number of PTP Ports   : 4 Sync. Status          : Syncing Accuracy Alert (ns)   : 1000 1588v2 PARENT DATA SET No Parent Data Set in Transparent Clock </pre>
<b>Error messages</b>	N/A
<b>Related commands</b>	<pre> show ptp profile c37.238 parent show ptp profile c37.238 clock </pre>

## Show PTP Profile C37.238 Clock Information

### Commands

**show ptp profile c37.238 clock**

<b>Syntax Description</b>	<table border="1"> <tr> <td><b>ptp</b></td> <td>Display PTP information</td> </tr> <tr> <td><b>profile</b></td> <td>Show PTP profile information</td> </tr> <tr> <td><b>c37.238</b></td> <td>Show C37.238-2017 profile details</td> </tr> <tr> <td><b>clock</b></td> <td>Display the clock information</td> </tr> </table>	<b>ptp</b>	Display PTP information	<b>profile</b>	Show PTP profile information	<b>c37.238</b>	Show C37.238-2017 profile details	<b>clock</b>	Display the clock information
<b>ptp</b>	Display PTP information								
<b>profile</b>	Show PTP profile information								
<b>c37.238</b>	Show C37.238-2017 profile details								
<b>clock</b>	Display the clock information								
<b>Defaults</b>	N/A								
<b>Command Modes</b>	Privileged EXEC/ User EXEC								
<b>Usage Guidelines</b>	N/A								
<b>Examples</b>	<pre> moxa# show ptp profile c37.238 clock  1588v2 CLOCK DATA SET PTP Clock Type        : Peer-to-Peer Boundary Clock PTP Device Profile    : IEEE C37.238-2017 Clock Identity        : 00:90:e8:ff:fe:d1:5a:53 Transport Type        : 802.3 Ethernet Clock Domain          : 0 Two-Step Flag         : True Number of PTP Ports   : 28 Priority1              : 129 Priority2              : 128 Clock Quality: Class                  : 248 Accuracy                : 254 Offset From Master(ns): 2.0 </pre>								

	<pre> Mean Path Delay(ns) : 8.0 Steps Removed      : 2 Maximum Steps Removed : 255 Slave Port         : 5 Sync. Status       : LOCKED Accuracy Alert(ns) : 1000 PTP Clock Time(TAI) : Wed Jan 20 19:10:20 2021  ##### ##### For Transparent moxa# show ptp profile c37.238 clock  1588v2 CLOCK DATA SET PTP Clock Type      : Peer-to-Peer Transparent Clock PTP Device Profile  : IEEE C37.238-2017 Clock Identity      : 00:90:e8:ff:fe:d1:5a:53 Transport Type      : 802.3 Ethernet Clock Domain        : 0 Two-Step Flag       : True Number of PTP Ports : 4 Sync. Status        : Syncing Accuracy Alert (ns) : 1000 </pre>
<b>Error messages</b>	N/A
<b>Related commands</b>	show ptp profile c37.238 parent

## Show PTP Profile C37.238 Parent Information

### Commands

**show ptp profile c37.238 parent**

<b>Syntax Description</b>	<b>ptp</b>	Display PTP information
	<b>profile</b>	Show PTP profile information
	<b>c37.238</b>	Show C37.238-2017 profile details
	<b>parent</b>	Display parent information
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC/ User EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<pre> moxa# show ptp profile c37.238 parent 1588v2 PARENT DATA SET Parent Clock:   Parent Clock Identity   : 70:c9:c6:ff:fe:96:34:80   Parent Port Number      : 1 Grandmaster Clock:   Grandmaster Clock Identity : 00:90:e8:ff:fe:d1:5a:53   Grandmaster Clock Quality:     Class                  : 248     Accuracy                : 254     Priority1               : 246     Priority2              : 248  ##### ##### For Transparent moxa# show ptp profile c37.238 parent 1588v2 PARENT DATA SET No Parent Data Set in Transparent Clock </pre>	

<b>Error messages</b>	N/A
<b>Related commands</b>	N/A

## Show PTP Profile C37.238 Port Information

### Commands

**show ptp profile c37.238 port** [<interface-type> <interface-id>]

<b>Syntax Description</b>	<b>ptp</b>	Display PTP information
	<b>profile</b>	Show PTP profile information
	<b>c37.238</b>	Show C37.238-2017 profile details
	<b>port</b>	Display the port information
	<interface-type>	Specify the interface type (Ethernet)
	<interface-id>	Specify the interface ID in the format <1-X>/<1-Y> (Slot Number/Port Number)
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC/ User EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<pre> moxa# show ptp profile c37.238 port Ethernet 1/1 1588v2 PORT DATA SET:   Port Identity           : 00:90:e8:ff:fe:11:22:40-1   Port State              : TRANSMITTING_SYNCHRONIZED   Port State              : Master   Announce Interval(log)  : 1   Announce Receipt Timeout : 3   Sync Interval(log)      : 0   Delay Req Interval(log) : 0   Pdelay Req Interval(log) : 0   Peer Mean Path Delay(ns) : 60  ##### ##### moxa# show ptp profile c37.238 port Ethernet 1/1 1588v2 PORT DATA SET:   Port Identity           : 00:90:e8:ff:fe:11:22:40-1   Pdelay Req Interval(log) : 0   Peer Mean Path Delay(ns) : 60 </pre>	
<b>Error messages</b>	N/A	
<b>Related commands</b>	N/A	

## Configure C37.238 2017 Profile Global Settings

### commands

**ptp profile c37.238 mode** {boundary | transparent} delay-mechanism p2p

<b>Syntax Description</b>	<b>ptp</b>	Configure PTP parameters
	<b>profile</b>	Configure a PTP profile
	<b>c37.238</b>	Configure C37.238-2017 profile parameters
	<b>mode</b>	Configure the PTP clock mode
	boundary	Set the PTP clock mode to Boundary Clock
	transparent	Set the PTP clock mode to Transparent Clock
	delay-mechanism	Configure the delay mechanism
	p2p	Apply the peer-to-peer delay mechanism
<b>Defaults</b>	Peer-to-peer boundary clock	
<b>Command Modes</b>	Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa (config)# ptp profile c37.238 mode boundary delay-mechanism p2p	
<b>Error messages</b>	N/A	
<b>Related commands</b>	N/A	

## Configure PTP Profile C37.237 Priority 1

### commands

**ptp profile c37.238 priority1** <value>

**no ptp profile c37.238 priority1**

<b>Syntax Description</b>	<b>ptp</b>	Configure PTP parameters
	<b>profile</b>	Configure a PTP profile
	<b>c37.238</b>	Configure C37.238-2017 profile parameters
	<b>priority1</b>	Configure Priority 1 parameters
	value>	Specify the priority (0-255)
<b>Defaults</b>	128	
<b>Command Modes</b>	Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa (config)# ptp profile c37.238 priority1 128 moxa (config)# no ptp profile c37.238 priority1	
<b>Error messages</b>	N/A	
<b>Related commands</b>	N/A	

## Configure PTP Profile C37.237 Priority 2

### commands

**ptp profile c37.238 priority2** <value>

**no ptp profile c37.238 priority2**

<b>Syntax Description</b>	<b>ptp</b>	Configure PTP parameters
	<b>profile</b>	Configure a PTP profile
	<b>c37.238</b>	Configure C37.238-2017 profile parameters
	<b>priority2</b>	Configure Priority 2 parameters
	<value>	Specify the priority (0-255)
<b>Defaults</b>	128	
<b>Command Modes</b>	Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa (config)# ptp profile c37.238 priority2 128 moxa (config)# no ptp profile c37.238 priority2	
<b>Error messages</b>	N/A	
<b>Related commands</b>	N/A	

## Configure the PTP Profile C37.238 Domain Number

### commands

**ptp profile c37.238 domain** <domain-number>

**no ptp profile c37.238 domain**

<b>Syntax Description</b>	<b>ptp</b>	Configure PTP parameters
	<b>profile</b>	Configure a PTP profile
	<b>c37.238</b>	Configure C37.238-2017 profile parameters
	<b>domain</b>	Configure the PTP domain number
	<domain-number>	Specify the domain number (0-127, 254)
<b>Defaults</b>	0	
<b>Command Modes</b>	Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa (config)# ptp profile c37.238 domain 0	
<b>Error messages</b>	N/A	
<b>Related commands</b>	N/A	

## Enable/Disable PTP Profile C37.238 Two-step Settings

### commands

**ptp profile c37.238 two-step enable**

**ptp profile c37.238 two-step disable**

<b>Syntax Description</b>	<b>ptp</b>	Configure PTP parameters
	<b>profile</b>	Configure a PTP profile
	<b>c37.238</b>	Configure C37.238-2017 profile parameters
	<b>two-step</b>	Configure the Two-step mode to generate follow-up message for synchronization event messages
	enable	Enable Two-step mode
	disable	Disable Two-step mode
<b>Defaults</b>	Two-step enabled	
<b>Command Modes</b>	Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa (config)# ptp profile c37.238 two-step enable moxa (config)# ptp profile c37.238 two-step disable	
<b>Error messages</b>	N/A	
<b>Related commands</b>	N/A	

## Remove the PTP Profile C37.238 Maximum Step

### commands

**ptp profile c37.238 maximum-step-removed <max step removed>**

**no ptp profile c37.238 maximum-step-removed**

<b>Syntax Description</b>	<b>ptp</b>	Configure PTP parameters
	<b>profile</b>	Configure a PTP profile
	<b>c37.238</b>	Configure C37.238-2017 profile parameters
	<b>maximum-step-removed</b>	Configure max steps removed parameters
	<max step removed>	Specify the maximum step removed for PTP
<b>Defaults</b>	255	
<b>Command Modes</b>	Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa (config)# ptp profile c37.238 maximum-step-removed 50	
<b>Error messages</b>	N/A	
<b>Related commands</b>	N/A	

## Configure the PTP Profile C37.238 Accuracy Alert Threshold

### commands

**ptp profile c37.238 accuracy-alert** <nanosecond>

**no ptp profile c37.238 accuracy-alert**

<b>Syntax Description</b>	<b>ptp</b>	Configure PTP parameters
	<b>profile</b>	Configure a PTP profile
	<b>c37.238</b>	Configure C37.238-2017 profile parameters
	<b>accuracy-alert</b>	Configure the accuracy alert threshold for Sync Status
	<nanosecond>	Specify the accuracy alert threshold in nanoseconds (50-250000000)
<b>Defaults</b>	1000	
<b>Command Modes</b>	Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa (config)# ptp profile c37.238 accuracy-alert 300	
<b>Error messages</b>	N/A	
<b>Related commands</b>	N/A	

## Configure PTP Profile C37.238 Grandmaster ID

### commands

**ptp profile c37.238 grandmaster-id** <grandmaster id>

**no ptp profile c37.238 grandmaster-id**

<b>Syntax Description</b>	<b>ptp</b>	Configure PTP parameters
	<b>profile</b>	Configure a PTP profile
	<b>c37.238</b>	Configure C37.238-2017 profile parameters
	<b>grandmaster-id</b>	Configure the Grandmaster ID
	<grandmaster id>	Specify the Grandmaster ID
<b>Defaults</b>	255	
<b>Command Modes</b>	Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa (config)# ptp profile c37.238 grandmaster-id 100	
<b>Error messages</b>	N/A	
<b>Related commands</b>	N/A	



## Configure PTP Profile C37.238 Port Settings

### Commands

**ptp profile c37.238**

**no ptp profile c37.238**

<b>Syntax Description</b>	<b>ptp/no ptp</b>	Configure PTP information
	<b>profile</b>	PTP profile selection
	<b>c37.238</b>	C37.238 2017 profile
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa (config)# interface Ethernet 1/1 /* Enable port ptp */ moxa (config-if)# ptp profile c37.238 %note: Profile setting will be applied to all ports. /* Disable port ptp */ moxa (config-if)# no ptp profile c37.238	
<b>Error messages</b>	N/A	
<b>Related commands</b>	N/A	

# Port

## Port Interface

### Port Setting

#### Show Interface Status

##### Commands

**show interface status**

<b>Syntax Description</b>	<b>show</b>	Show running system information				
	<b>interface</b>	Display interface information				
	<b>status</b>	The status of the interface				
<b>Defaults</b>	N/A					
<b>Command Modes</b>	Privileged EXEC					
<b>Usage Guidelines</b>	N/A					
<b>Examples</b>	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	-
<b>Error Messages</b>	N/A					
<b>Related Commands</b>	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 }] ] }

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<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  Transmission Counters   Octets           : 0   Unicast Packets  : 0   Multicast Packets : 0   Broadcast Packets : 0   Discarded Packets : 0   Error Packets    : 0</pre>	

	Bad CRC : 0
	Error Drops : 0
	Timeout Drops : 0
	Error Packets : 0
<b>Error Messages</b>	N/A
<b>Related Commands</b>	N/A

## Show Port-channel Interface

### Commands

**show interfaces port-channel**

<b>Syntax Description</b>	<b>show</b>	Display configuration/statistics/general information
	<b>interfaces</b>	Display interface information
	<b>port-channel</b>	Display the port-channel interface
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<pre> moxa# show interfaces port-channel  Port : Eth1/2 -----  Port State = Down, Not in Bundle Reason for port-down : Oper status of the port is down Channel Group : 1 Mode : LACP Actual Port-channel = Null Configured port-channel = Po1 LACP port-priority = 128 LACP Wait-time = 2 secs LACP Port Identifier = 2 LACP Activity : Active LACP Timeout : Long LACP Error State : None  Aggregation State : Aggregation, Defaulted            LACP Port  Admin Oper Port  State  Priority  Key  Key ----- Eth1/2  Down  128      1    1  Port-channel : Po1 ----- Number of Ports = 1 Protocol = LACP Aggregator-MAC 00:90:e8:72:56:2e Maximum number of Ports = 8 Port-Channel Speed = 0 Mbps </pre>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Show Interface Description

### Commands

#### show interface description

<b>Syntax Description</b>	<b>show</b>	Display configuration/statistics/general information	
	<b>interface</b>	Display interface information	
	<b>description</b>	Description about the interface	
<b>Defaults</b>	N/A		
<b>Command Modes</b>	Privileged EXEC		
<b>Usage Guidelines</b>	N/A		
<b>Examples</b>	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		
<b>Error Messages</b>	N/A		
<b>Related Commands</b>	N/A		

# Show Flow Control

## Commands

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

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# show flow-control	
	<pre> 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 </pre>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Show Linkup Delay Status

### Commands

**show linkup-delay**

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

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<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>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Configure Shutdown Settings

### Commands

**shutdown**

**no shutdown**

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

## Configure Description Settings

### Commands

**description** <description of this interface>

**no description**

<b>Syntax Description</b>	<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
<b>Defaults</b>	Empty string	
<b>Command Modes</b>	Interface Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config-if)# description moxa	
<b>Error Messages</b>	% Port Setting: Invalid: data.portTable[0].description must be shorter than or equal to 127 characters	
<b>Related Commands</b>	N/A	

## Configure Duplex Settings

### Commands

**duplex** { full | half }

<b>Syntax Description</b>	<b>duplex</b>	Configure duplex parameters
	full	Set the port to full-duplex mode
	half	Set the port to half-duplex mode
<b>Defaults</b>	The port is full-duplex without auto-negotiation by default	
<b>Command Modes</b>	Interface Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config-if)# no auto-negotiation moxa(config-if)# duplex full	
<b>Error Messages</b>	% 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.	
<b>Related Commands</b>	speed { 10   100 }	

## Configure Speed Settings

### Commands

**speed** { 10 | 100 }

<b>Syntax Description</b>	<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
<b>Defaults</b>	The port is set to 100 Mbps by default if auto-negotiation is disabled on the port	
<b>Command Modes</b>	Interface Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config-if)# no auto-negotiation moxa(config-if)# speed 100	
<b>Error Messages</b>	% 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.	
<b>Related Commands</b>	duplex { full   half }	



## Enable/Disable Flow Control Setting

### Commands

**flowcontrol** { on | off }

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

## Configure MDIX Setting

### Commands

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

<b>Syntax Description</b>	<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
<b>Defaults</b>	Auto-crossover is enabled by default	
<b>Command Modes</b>	Interface Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config-if)# mdix auto	
<b>Error Messages</b>	% 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.	
<b>Related Commands</b>	N/A	

## Linkup Delay

### Enable/Disable Linkup Delay

#### Commands

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

**no linkup-delay**

<b>Syntax Description</b>	<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
<b>Defaults</b>	System-wide linkup-delay is disabled by default	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# linkup-delay disable	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	linkup-delay linkup-delay timer <integer (1-1000)>	

## Configure Linkup Delay Timer

### Commands

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

<b>Syntax Description</b>	<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
<b>Defaults</b>	The linkup delay timer is 2 seconds by default	
<b>Command Modes</b>	Interface Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config-if)# linkup-delay timer 2	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	linkup-delay [ enable   disable ] linkup-delay	

## Configure Auto-Negotiation Setting

### Commands

**auto-negotiation**

**no auto-negotiation**

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

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	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	
<b>Error Messages</b>	'Invalid: Link Aggregation/Port-Channel group is out of range.' 'Invalid: Port channel should be activated before setting the selection policy configuration.' 'Invalid: The port-channel does not exist.'	
<b>Related Commands</b>	show port-channel load-balance	

### Configure Port Channel Shutdown Settings

#### Commands

**shutdown**

**no shutdown**

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

<b>Syntax Description</b>	<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
<b>Defaults</b>	Port-channel load balancing is set to source/destination MAC address (src-dest-mac) by default	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	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	
<b>Error Messages</b>	'Invalid: Link Aggregation/Port-Channel group is out of range.' 'Invalid: Port channel should be activated before setting the selection policy configuration.' 'Invalid: The port-channel does not exist.'	
<b>Related Commands</b>	show port-channel load-balance	

## Configure Channel Group Mode

### Commands

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

**no channel-group**

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Interface Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<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>	
<b>Error Messages</b>	<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>	
<b>Related Commands</b>	<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**

<b>Syntax Description</b>	<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
<b>Defaults</b>	The default wait time is 2 seconds	
<b>Command Modes</b>	Interface Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	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	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Configure LACP Timeout Settings

### Commands

**lACP timeout** { long | short }

**no lACP timeout**

<b>Syntax Description</b>	<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
<b>Defaults</b>	LACP timeout is set to long by default	
<b>Command Modes</b>	Interface Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	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	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Show Link Aggregation Information

### Commands

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

<b>Syntax Description</b>	<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	
<b>Defaults</b>	N/A	
<b>Command Modes</b>	User EXEC Privileged EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	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	
<b>Error Messages</b>	'Invalid: The port-channel does not exist.'	
<b>Related Commands</b>	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 }

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	User EXEC Privileged EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# show interfaces ethernet 0/1 port-channel	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	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 }

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

### Configure Power Budget Setting

#### Commands

**poe system-power-budget** <watt: integer (30- maximum power budget value of product)>

<b>Syntax Description</b>	<b>poe</b>	Configure PoE parameters
	<b>system-power-budget</b>	The total power budget for all PDs connected to the switch
	watt: integer (30- maximum power budget value of product)	Set the power budget depending on the external power supply's (EPS) output ability
<b>Defaults</b>	The default power budget is set to 720 watts	
<b>Command Modes</b>	Privileged EXEC Global Configuration	
<b>Usage Guidelines</b>	Data range: watt: 30- maximum power budget value of product	
<b>Examples</b>	moxa(config)# poe system-power-budget 90	
<b>Error Messages</b>	'Invalid: Sum of power allocation cannot exceed system power budget.'	
<b>Related Commands</b>	show poe [interface <iftype> <ifnum>] {config   status   diagnosis}	

### Configure Auto Power Cutting Settings

#### Commands

**poe auto-power-cutting**

**no poe auto-power-cutting**

<b>Syntax Description</b>	<b>poe</b>	Configure PoE parameters
	<b>auto-power-cutting</b>	Enable auto power cutting to automatically cut power to specific PDs when the consumed PoE power exceeds the system power budget
<b>Defaults</b>	This feature is disabled by default.	
<b>Command Modes</b>	Privileged EXEC Global Configuration	
<b>Usage Guidelines</b>	Enables auto power-cutting to lower priority PDs to ensure the PoE power supply of higher priority PDs. Use the no version of this command to disable the feature.	
<b>Examples</b>	moxa(config)# poe auto-power-cutting Are you sure you want to enable the auto-power-cutting? If so, the power-management-mode will become consumed-power mode. [y/N] y	



	moxa(config)# no poe auto-power-cutting Are you sure you want to disable the auto-power-cutting? If so, the power-management-mode will become allocated-power mode. [y/N] y
<b>Error Messages</b>	N/A
<b>Related Commands</b>	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**

<b>Syntax Description</b>	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>poe</b>	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
<b>Defaults</b>	<b>device-ip:</b> 0.0.0.0 seconds: 10 times: 3 <b>action:</b> no-action Data range: seconds: 5-300 times: 1-10	
<b>Command Modes</b>	Privileged EXEC Interface Configuration	
<b>Usage Guidelines</b>	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> .	
<b>Examples</b>	moxa(config-if)# poe pd-failure-check device-ip 192.168.127.101 moxa(config-if)# no poe pd-failure-check	
<b>Error Messages</b>	'Invalid: Device IP is not a valid IP address.'	
<b>Related Commands</b>	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)>

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC Global Configuration	
<b>Usage Guidelines</b>	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.	
<b>Examples</b>	moxa(config)# poe scheduling bt01 2036 10 5 23 0 23 50	
<b>Error Messages</b>	'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.'	
<b>Related Commands</b>	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

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

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

<b>Syntax Description</b>	<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>Defaults</b>	Scheduling rules are not applied to ports by default	
<b>Command Modes</b>	Privileged EXEC Interface Configuration	
<b>Usage Guidelines</b>	Apply PoE scheduling rules to ports.	
<b>Examples</b>	moxa(config-if)# po e scheduling bt01 moxa(config-if)# no po e scheduling bt01	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	show po e scheduling [<rule-name: string (63)>]	

## Remove PoE Schedule Setting

### Commands

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

<b>Syntax Description</b>	<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>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC Global Configuration	
<b>Usage Guidelines</b>	Delete a scheduling rule.	
<b>Examples</b>	moxa(config)# no po e scheduling bt01	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	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 Scheduling Rule Setting

### Commands

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

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

<b>Syntax Description</b>	<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
	activate	Activate the PoE scheduling rule
<b>Defaults</b>	The scheduling rule is not activated by default	
<b>Command Modes</b>	Privileged EXEC Global Configuration	
<b>Usage Guidelines</b>	Activate a rule to apply the rule.	
<b>Examples</b>	moxa(config)# poe scheduling <rule-name: string (63)> activate moxa(config)# no poe scheduling <rule-name: string (63)> activate	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	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

**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 }

<b>Syntax Description</b>	<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>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	
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC Global Configuration	
<b>Usage Guidelines</b>	Set PoE scheduling rules to repeat on the specified day(s).	
<b>Examples</b>	moxa(config)# no poe scheduling <rule-name: string(63)> repeat {daily   weekday   weekend   sunday   monday   tuesday   wednesday   thursday   friday   saturday}	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	moxa(config)# poe scheduling bt01 repeat daily moxa(config)# no poe scheduling bt01 repeat daily	

## Configure Port Power Output Setting

### Commands

**poe**  
**no poe**

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

## Configure Port Power Output Mode Settings

### Commands

**poe output-mode { auto | force power-allocation <watt: integer(Minimum - Maximum power output limit value of product)> }**

<b>Syntax Description</b>	<b>poe</b>	Configure PoE parameters
	<b>output-mode</b>	Configure the PoE power output mode
	<b>auto</b>	Set the PoE output mode to Standard
	<b>force</b>	Set the PoE output mode to Force, for non-standard or legacy PDs
	<b>power-allocation</b>	Configure the PoE power output limit for Force mode
	<watt: integer (Minimum - Maximum power output limit value of product)>	Specify the PoE power output limit (in Watts), available output range depends on the product specifications
<b>Defaults</b>	The output-mode is set to Auto by default.	
<b>Command Modes</b>	Privileged EXEC Interface Configuration	
<b>Usage Guidelines</b>	Auto mode is suitable for 802.3bt standard PDs. Power allocation value is 0. Force mode suitable for non-standard and legacy PDs. Power output range: The minimum and maximum power output limit of the product depends on the product specifications	
<b>Examples</b>	moxa(config-if)# poe output-mode force power-allocation 30	
<b>Error Messages</b>	'Invalid: In PoE Output Auto Mode, the Power Allocation value is not valid.' 'Invalid: Sum of power allocation cannot exceed system power budget.'	
<b>Related Commands</b>	show poe [interface <iftype> <ifnum>] {config   status   diagnosis}	

## Reset PoE Output Mode

### Commands

**no poe output-mode**

<b>Syntax Description</b>	<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
<b>Defaults</b>	The output-mode is set to auto by default	
<b>Command Modes</b>	Privileged EXEC Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config-if)# no poe output-mode	
<b>Error Messages</b>	'Invalid: In PoE Output Auto Mode, the Power Allocation value is not valid.'	

<b>Related Commands</b>	show poe [interface <iftype> <ifnum>] {config   status   diagnosis}
-------------------------	---

## Configure Port Legacy PD Detection Settings

### Commands

**poe legacy-pd-detection**  
**no poe legacy-pd-detection**

<b>Syntax Description</b>	<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
<b>Defaults</b>	Legacy PD detection is disabled by default.	
<b>Command Modes</b>	Privileged EXEC Interface Configuration	
<b>Usage Guidelines</b>	Enable legacy PD detection on ports to power PDs within the 2.7 to 10 $\mu$ F capacitance range	
<b>Examples</b>	moxa(config-if)# poe legacy-pd-detection moxa(config-if)# no poe legacy-pd-detection	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	show poe [interface <iftype> <ifnum>] {config   status   diagnosis}	

## Configure Port Auto Power Cutting Priority Setting

### Commands

**poe priority** { critical | high | low }  
**no poe priority**

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

## PoE Status

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

#### Commands

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

<b>Syntax Description</b>	<b>show</b>	Display configuration/status information
	<b>poe</b>	Display PoE information
	<b>interface</b>	Display interface information
	<iftype>	Specify the interface type
	<ifnum>	Specify the interface number

	<b>config</b>	Display the PoE configuration
	<b>status</b>	Display PoE status
	<b>diagnosis</b>	Display the PoE diagnosis
<b>Defaults</b>	N/A	
<b>Command Modes</b>	User EXEC Privileged EXEC	
<b>Usage Guidelines</b>	<p>For bt PoE (RKS/EDS Series):</p> <ol style="list-style-type: none"> <li>If the PoE Power Management Mode is "Allocated Power", the Remaining Available Power is the "Power Budget Limit" minus "Allocated Power".</li> <li>If the PoE Power Management Mode is "Consumed Power", the Remaining Available Power is the "Power Budget Limit" minus "Consumed Power".</li> </ol> <p>For PoE (MDS Series):</p> <ol style="list-style-type: none"> <li>If the PoE Power Management Mode is "Allocated Power", the "Remaining Available Power" is the "Maximum Input Power" minus "Allocated Power".</li> <li>If the PoE Power Management Mode is "Consumed Power", the Remaining Available Power is the "Maximum Input Power" minus "Consumed Power".</li> </ol>	
<b>Examples</b>	<pre>moxa# show poe diagnosis SS - Single Signature, DS - Dual Signature Port  Device Type  Config Suggestion ----- Eth1/1  Not present  No suggestion Eth1/2  Not present  No suggestion Eth1/3  Not present  No suggestion Eth1/4  Not present  No suggestion Eth1/5  Not present  No suggestion Eth1/6  Not present  No suggestion Eth1/7  Not present  No suggestion Eth1/8  802.3 bt DS  Select PoE output mode to Auto  moxa# show poe status Power Budget Limit: 180 Allocated Power: 46 Consumed Power: 1 Remaining Available Power: 134  Port  Power Output  Classification  Current Voltage Consumption ----- Eth1/1  Off           Unknown        0.00  0.00  0.00 Eth1/2  Off           Unknown        0.00  0.00  0.00 Eth1/3  Off           Unknown        0.00  0.00  0.00 Eth1/4  Off           Unknown        0.00  0.00  0.00 Eth1/5  Off           0              0.00  0.00  0.00 Eth1/6  Off           0              0.00  0.00  0.00 Eth1/7  Off           0              0.00  0.00  0.00 Eth1/8  On            3,4           14.65  48.59  0.71</pre>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	<pre>poe {enable   disable} poe system-power-budget &lt;watt: integer (30-Maximum value of actual power budget*)&gt; poe auto-power-cutting no poe auto-power-cutting poe no poe poe output-mode { auto   force power-allocation &lt;watt: integer(0-90)&gt; } poe legacy-pd-detection no poe legacy-pd-detection poe priority { critical   high   low } no poe priority</pre>	

\* The system power budget value depends on the product specifications.

## Show Port PD Failure Check Setting and Status

### Commands

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

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	User EXEC Privileged EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<pre>moxa# show poe pd-failure-check interface ethernet 2/4 config Enable: Enabled Device IP: 192.168.127.101 Check Frequency (sec): 5 No Response Times: 1 Action: Restart PD</pre>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	<pre>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 } } ] no poe pd-failure-check</pre>	

## Show Scheduling Rule Setting

### Commands

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

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	User EXEC Privileged EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<pre>moxa# show poe scheduling rule1 Rule Name: test Enable: Enabled Start Date (YYYY/MM/DD): 2020/05/29 Schedule Time: 08:00-15:00, None Apply the same setting to port: Eth1/4</pre>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	<pre>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; poe scheduling &lt;rule-name: string(63)&gt; activate no poe scheduling &lt;rule-name: string(63)&gt; activate poe scheduling &lt;rule-name: string(63)&gt; repeat { daily   weekday   weekend   sunday   monday   tuesday   wednesday   thursday   friday   saturday } no poe scheduling &lt;rule-name: string(63)&gt; repeat { daily   weekday   weekend   sunday   monday   tuesday   wednesday   thursday   friday   saturday } poe scheduling &lt;rule-name: string(63)&gt; no poe scheduling &lt;rule-name: string(63)&gt;</pre>	



## Configure Power Management Mode Settings

### Commandsw

**po power-management-mode** { allocated-power | consumed-power }

<b>Syntax Description</b>	po	Configure PoE parameters
	power-management-mode	Power management mode depends on power usage of all ports
	allocated-power	Calculate power budget of all ports
	consumed-power	Calculate real-time power consumption of all ports
<b>Defaults</b>	The default value of power-management-mode depends on Product Spec	
<b>Command Modes</b>	Privileged EXEC Global Configuration	
<b>Usage Guidelines</b>	<p>In allocated-power mode, the PoE system will calculate power budget of all ports.</p> <p>In consumed-power mode, the PoE system will calculate real-time power consumption of all ports.</p> <p>Hint:</p> <p>Are you sure you want to select the allocated-power mode? If so, the auto-power-cutting will be disabled. [y/N]</p> <p>Are you sure you want to select the consumed-power mode? If so, the auto-power-cutting will be enabled. [y/N]</p>	
<b>Examples</b>	<pre>moxa(config)# po power-management-mode allocated-power Are you sure you want to select the allocated-power mode? If so, the auto-power-cutting will be disabled. [y/N] y moxa(config)# po power-management-mode consumed-power Are you sure you want to select the consumed-power mode? If so, the auto-power-cutting will be enabled. [y/N] y</pre>	
<b>Error Messages</b>	N/A	

# Layer 2 Switching

## VLAN

### IEEE 802.1Q

#### Show VLAN Device Information

##### Commands

**show vlan device info**

<b>Syntax Description</b>	<b>vlan</b>	Display VLAN bridge status and information
	<b>device</b>	The VLAN device
	<b>info</b>	Information
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC/ User EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	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	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	gvrp gmrp bridge-mode	

## Show VLAN Interface Status

### Commands

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

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC/ User EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<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>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	<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> }]

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC/ User EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<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>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	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> }]

<b>Syntax Description</b>	<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	
	<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC/ User EXEC		
<b>Usage Guidelines</b>	N/A		
<b>Examples</b>	moxa# show mac-address-table		
	<pre> vlan  Mac Address      Type  ConnectionId  Ports ----  - 1     00:00:5e:00:01:02  Learnt          Eth1/3 1     00:21:cc:62:f7:0b  Learnt          Eth1/3 1     00:21:cc:72:a8:d7  Learnt          Eth1/3  Total Mac Addresses displayed: 3 </pre>		
	Total Mac Addresses displayed: 3		
	<b>Error Messages</b>	N/A	
	<b>Related Commands</b>	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> }]

<b>Syntax Description</b>	<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 interface-id	The Ethernet type The port-channel The slot number/port number
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC/User EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<pre>moxa# show mac-address-table dynamic unicast  vlan  Mac Address      Type  ConnectionId  Ports ----  - 1     00:00:5e:00:01:02  Learnt          Eth1/3 1     00:05:1b:a1:ae:62  Learnt          Eth1/3 1     00:0c:29:9b:83:e9  Learnt          Eth1/3 .... Total Mac Addresses displayed: 44  iss# show mac-address-table dynamic multicast  vlan  Mac Address      Type  ConnectionId  Ports ----  - Total Mac Addresses displayed: 0</pre>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	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> }]

<b>Syntax Description</b>	<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 interface-id	The Ethernet type The port-channel The slot number/port number
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC/ User EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<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          Eth1/3 1     00:31:13:31:13:13      DeleteOnReset     Eth1/3 1     00:44:33:44:33:44      Permanent          Eth1/4  Total Mac Addresses displayed: 3 </pre>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	mac-address-table	

## Show GVRP Statistics

### Commands

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

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC/ User EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<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>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	vlan active	



## Show VLAN Management

### Commands

**show management vlan**

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

## Create/Delete a VLAN

### Commands

**vlan** <vlan-id>

**no vlan** <vlan-id>

**vlan active**

**vlan name** < vlan name string >

<b>SyntaxDescription</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# vlan 100 moxa(config-vlan)# vlan active moxa(config)# no vlan 100 moxa(config)#	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	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>])]

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Config VLAN mode	
<b>Usage Guidelines</b>	This command can only be executed from within VLAN configuration mode. From Configuration mode, enter vlan <vlan-id> to enter VLAN config mode.	
<b>Examples</b>	<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>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	vlan active switchport mode show vlan show mac-address-table count	

## 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>

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# mac-address-table static unicast 00:11:22:33:22:11 vlan 1 set ethernet 1/2 status permanent	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	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}

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

## Enable/Disable GVRP on Specific Ports

### Commands

**gvrp**

**no gvrp**

<b>Syntax Description</b>	<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)
<b>Defaults</b>	GVRP is disabled by default	
<b>Command Modes</b>	Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# interface Ethernet 1/1 moxa(config-if)# gvrp	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	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**

<b>Syntax Description</b>	<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
<b>Defaults</b>	300s	
<b>Command Modes</b>	Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# mac-address-table aging-time 100	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	show mac-address-table aging-time	

## Configure PVID on a Specified Port

### Commands

**switchport pvid** <vlan-id>

**no switchport pvid**

<b>Syntax Description</b>	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>pvid</b>	Configure port-based VLAN parameters
	vlan-id	The VLAN ID, ranging from 1 to 4094.
<b>Defaults</b>	1	
<b>Command Modes</b>	Configuration	
<b>Usage Guidelines</b>	<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> <p>Remove this port from member port list if it is bound to another VID which is different from PVID</p> <p>Modify this port into an untagged member of this PVID</p> <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>	
<b>Examples</b>	moxa(config-if)# switchport pvid 1	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	switchport vlan vlan active switchport acceptable-frame-type	

## Configure VLAN-dependent BPDU Frames

### Commands

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

<b>Syntax Description</b>	<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.
<b>Defaults</b>	all	
<b>Command Modes</b>	Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config-if)# switchport acceptable-frame-type untaggedAndPrioritytagged	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	switchport switchport pvid switchport ingress-filter switchport mode show vlan port config	

## Enable/Disable Ingress Filter

### Commands

**switchport ingress-filter**

**no switchport ingress-filtering**

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

## Configure Switch Port Operation Mode

### Commands

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

<b>Syntax Description</b>	<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: GVRP is disabled for that port. The acceptable frame type is set as "Admit untagged and pri-tagged". The port is not a tagged member of any VLAN. The PVID is the same as the only untagged VLAN it joined.
	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: The acceptable frame type is set as "Admit tagged only" The port is not an untagged member of any VLAN.
hybrid	Configures the port as a hybrid port that accepts and sends both tagged and untagged frames	
<b>Defaults</b>	The default port operation mode is set to Hybrid	
<b>Command Modes</b>	Configuration	
<b>Usage Guidelines</b>	When changing from trunk or hybrid to access mode, the following changes will be automatically applied: Forces the port to become an untagged member of the PVID domain If the port exists in another VLAN, it will be removed Forces the accept frame type to be set to "Admit untagged and pri-tagged" When changing from access or hybrid to trunk mode, the following changes will be automatically applied: Forces the port to become a tagged member of the PVID domain If the port was an untagged member in another VLAN, it will change into a tagged member. Forces the accept frame type to be set to "Admit tagged only" When changing from access or trunk to hybrid mode, there will be no changes	
<b>Examples</b>	moxa (config-if)# switchport mode hybrid	
<b>Error Messages</b>	N/A	

<b>Related Commands</b>	switchport port gvrp vlan ports switchport acceptable-frame-type show vlan port config
-------------------------	--

## Configure Restricted VLAN Registration

### Commands

#### vlan restricted

<b>Syntax Description</b>	<b>vlan restricted</b>	Configure restricted VLAN parameters 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.
<b>Defaults</b>	Restricted VLAN registration is disabled by default	
<b>Command Modes</b>	Privileged EXEC/ User EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config-if)# vlan restricted	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	show vlan port config	

## Create Filtering Utility Criteria

### Commands

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

<b>Syntax Description</b>	<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	Only allow the learning of source MAC from a packet received on the port if the following conditions are met: 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 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.
<b>Defaults</b>	By default, the VLAN filtering utility criteria is set to default	
<b>Command Modes</b>	Privileged EXEC/ User EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config-if)# switchport filtering-utility-criteria default	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	show vlan port config	

## Set VLAN Access Port

### Commands

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

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

## Configure VLAN Management

### Commands

**management vlan** <vlan-id>

**no management vlan**

<b>Syntax Description</b>	<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 (1-4096)
<b>Defaults</b>	The default management VLAN ID is set to 1	
<b>Command Modes</b>	Privileged EXEC/ User EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# management vlan 1	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Show VLAN Statistic

### Commands

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

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC/ User EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# show vlan statistics vlan 3 Software Statistics Disabled Unicast/broadcast Vlan statistics	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	



# GARP

## Show GARP Timer

### Commands

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

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC/ User EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# show garp timer Garp Port Timer Info (in milli seconds) ----- 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 .....	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	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>

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC/ User EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# mac-address-table static unicast aa:aa:aa:bb:bb:cc vlan 168 set interface ethernet 2/4 status permanent	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	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> }]

<b>Syntax Description</b>	<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	The Ethernet type																				
	port-channel	The port-channel																				
	interface-id	The slot number/port number																				
<b>Defaults</b>	N/A																					
<b>Command Modes</b>	Privileged EXEC/ User EXEC																					
<b>Usage Guidelines</b>	N/A																					
<b>Examples</b>	<pre>moxa# show mac-address-table</pre> <table border="1"> <thead> <tr> <th>vlan</th> <th>Mac Address</th> <th>Type</th> <th>ConnectionId</th> <th>Ports</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>00:00:5e:00:01:02</td> <td>Learnt</td> <td></td> <td>Eth1/3</td> </tr> <tr> <td>1</td> <td>00:21:cc:62:f7:0b</td> <td>Learnt</td> <td></td> <td>Eth1/3</td> </tr> <tr> <td>1</td> <td>00:21:cc:72:a8:d7</td> <td>Learnt</td> <td></td> <td>Eth1/3</td> </tr> </tbody> </table> <p>Total Mac Addresses displayed: 3</p>		vlan	Mac Address	Type	ConnectionId	Ports	1	00:00:5e:00:01:02	Learnt		Eth1/3	1	00:21:cc:62:f7:0b	Learnt		Eth1/3	1	00:21:cc:72:a8:d7	Learnt		Eth1/3
vlan	Mac Address	Type	ConnectionId	Ports																		
1	00:00:5e:00:01:02	Learnt		Eth1/3																		
1	00:21:cc:62:f7:0b	Learnt		Eth1/3																		
1	00:21:cc:72:a8:d7	Learnt		Eth1/3																		
<b>Error Messages</b>	N/A																					
<b>Related Commands</b>	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)>

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa (config)# qos ip-dscp-mapping dscp-priority 0 cos-priority 1	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	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)>

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa (config)# qos cos-mapping cos-priority 1 queue-id 2	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	moxa# show qos cos-mapping [cos-priority <integer (0-7)>]	

### Configure QoS Default Priority Setting

#### Commands

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

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

## Configure QoS P-bit Preference

### Commands

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

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

## Show QoS DSCP Mapping Rule

### Commands

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

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<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>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	moxa (config)# qos ip-dscp-mapping dscp-priority <dscp-priority(0-63)> cos-priority <cos-priority(0-7)>	

## Show QoS COS Mapping Rule

### Commands

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

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<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>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	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 default-priority** [ interface <iftype> <ifnum> ]

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<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>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	moxa (config)# qos default-priority <default-priority(0-7)>	

## Show QoS P-bit Preference

### Commands

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

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC Mode	
<b>Usage Guidelines</b>	If no interface is entered, the QoS pbit preference is shown for all ports.	
<b>Examples</b>	<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>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	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**

<b>Syntax Description</b>	<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	
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Interface configuration mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa (config-if)# qos rate-limit-type simple-token-bucket cir 100 cbs 2000 conform-action do-nothing violate-action drop	
<b>Error Messages</b>	'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.'	
<b>Related Commands</b>	moxa # show qos rate-limit [interface <iftype> <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)>}

<b>Syntax Description</b>	<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	
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Interface configuration mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa (config-if)# qos rate-limit-type simple-token-bucket cir 500 cbs 2000 conform-action remark-cos 6 violate-action drop	
<b>Error Messages</b>	'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.'	
<b>Related Commands</b>	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)>}

<b>Syntax Description</b>	<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	
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Interface configuration mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa (config-if)# qos rate-limit-type simple-token-bucket cir 500 cbs 2000 conform-action remark-dscp 50 violate-action drop	
<b>Error Messages</b>	'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.'	
<b>Related Commands</b>	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**

<b>Syntax Description</b>	<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	
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Interface configuration mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa (config-if)# qos rate-limit-type srtcm cir 500 cbs 2000 ebs 2500 conform-action none exceed-action drop violate-action drop	
<b>Error Messages</b>	'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.'	
<b>Related Commands</b>	moxa # show qos rate-limit [interface <iftype> <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)>}

<b>Syntax Description</b>	<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>Defaults</b>	<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
<b>Command Modes</b>	Interface configuration mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	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	
<b>Error Messages</b>	'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.'	
<b>Related Commands</b>	moxa # show qos rate-limit [interface <iftype> <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)>}

<b>Syntax Description</b>	<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	
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Interface configuration mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	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	
<b>Error Messages</b>	'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.'	
<b>Related Commands</b>	moxa # show qos rate-limit [interface <iftype> <ifnum>]	

## Show Ingress Rate Limit Parameters

### Commands

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

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<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 ----- Meter Type          : Simple Token Bucket CIR                 : Disable CBS                 : Disable EBS                 : Disable Color Mode          : Blind ..... </pre>	
<b>Error Messages</b>	N/A	

<b>Related Commands</b>	moxa(config-if)# qos rate-limit-type {simple-token-bucket   srtcm} [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}

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



## Show QoS Scheduler Setting

### Commands

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

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<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>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	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)>

<b>Syntax Description</b>	<b>qos</b>	Configure QoS parameters
	<b>shaper</b>	Configure QoS shaper parameters
	<b>cir</b>	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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Interface configuration mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa (config-if)# qos shaper cir 500 cbs 2000	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	moxa# show qos shaper [interface <iftype> <ifnum>]	

### Show Shaper Setting

#### Commands

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

<b>Syntax Description</b>	<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
	<b>Defaults</b>	N/A
<b>Command Modes</b>	Privileged EXEC Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	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 .....	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	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}

<b>Syntax Description</b>	<b>igmp-snooping</b>	Configure IGMP Snooping parameters
	enable	Enable system-based IGMP Snooping
	disable	Disable system-based IGMP Snooping
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	GMRP has to be disabled in order to enable GMP snooping	
<b>Examples</b>	moxa# configure terminal moxa(config)# igmp-snooping enable moxa# configure terminal moxa(config)# igmp-snooping disable	
<b>Error Messages</b>	'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.'	
<b>Related Commands</b>	moxa# show igmp-snooping globals	

### Configure VLAN-based IGMP Snooping

#### Commands

**igmp-snooping**

**no igmp-snooping**

<b>Syntax Description</b>	<b>igmp-snooping</b>	Configure IGMP Snooping parameters
	no	Remove configuration/delete entry/reset to default value
<b>Defaults</b>	VLAN-based IGMP Snooping is disabled by default	
<b>Command Modes</b>	Config-VLAN Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	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	
<b>Error Messages</b>	'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.'	
<b>Related Commands</b>	moxa# show igmp snooping [vlan <vlanid> ]	

## Configure IGMP Querier Role

### Commands

**igmp-snooping querier**

**no igmp-snooping querier**

<b>Syntax Description</b>	<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
<b>Defaults</b>	By default, the switch is configured as a non-querier	
<b>Command Modes</b>	Config-VLAN Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<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>	
<b>Error Messages</b>	<pre>'Invalid: If IGMP snooping is enabled, then GMRP must be disabled.'</pre> <pre>'Invalid: VLAN ID ca not 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>	
<b>Related Commands</b>	<pre>moxa# show igmp-snooping [vlan &lt; vlanid&gt; ]</pre>	

## Configure IGMP Snooping Version

### Commands

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

<b>Syntax Description</b>	<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
<b>Defaults</b>	The default IGMP Snooping version is v2	
<b>Command Modes</b>	Config-VLAN Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<pre>moxa# configure terminal moxa(config)# vlan 2 moxa(config-vlan)# igmp-snooping moxa(config-vlan)# igmp-snooping version v3</pre>	
<b>Error Messages</b>	<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>	
<b>Related Commands</b>	<pre>moxa# show igmp-snooping [vlan &lt; vlanid&gt; ]</pre>	

## Configure IGMP Snooping General Query Interval

### Commands

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

**no igmp-snooping query-interval**

<b>Syntax Description</b>	<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
<b>Defaults</b>	The default IGMP Snooping general query interval is set to 125 seconds	
<b>Command Modes</b>	Config-VLAN Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<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>	
<b>Error Messages</b>	<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>	
<b>Related Commands</b>	<pre>moxa# show igmp-snooping [vlan &lt;vlanid&gt; ]</pre>	

## 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>]

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Config-VLAN Mode	
<b>Usage Guidelines</b>	IGMP snooping of VLAN must enabled	
<b>Examples</b>	<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>	
	<b>Error Messages</b>	'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.'
<b>Related Commands</b>	moxa# show igmp-snooping router-port [Vlan <vlan-id/vfi-id>]	

## Show System IGMP Snooping Information

### Commands

**show igmp-snooping globals**

<b>Syntax Description</b>	show	Display configuration/status information
	igmp-snooping	Display IGMP Snooping information
	globals	IGMP Snooping system-based information
<b>Defaults</b>	N/A	
<b>Command Modes</b>	User EXEC Privileged EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<pre>moxa# show igmp-snooping globals IGMP Snooping global status is enabled</pre>	
<b>Error Messages</b>	'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.'	
<b>Related Commands</b>	moxa(config)# igmp-snooping {enable   disable}	

## Show IGMP Information of VLAN

### Commands

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

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	User EXEC Privileged EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<pre>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</pre>	
<b>Error Messages</b>	<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>	
<b>Related Commands</b>	<pre>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 &lt;(20 - 600) second&gt;</pre>	

## Show IGMP Information of Forwarding Database

### Commands

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

<b>Syntax Description</b>	<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																
<b>Defaults</b>	N/A																	
<b>Command Modes</b>	User EXEC Privileged EXEC																	
<b>Usage Guidelines</b>	N/A																	
<b>Examples</b>	<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															
<b>Error Messages</b>	'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.'																	
<b>Related Commands</b>	N/A																	

## Show IGMP Information of Group Membership Table

### Commands

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

<b>Syntax Description</b>	<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										
<b>Defaults</b>	N/A											
<b>Command Modes</b>	User EXEC Privileged EXEC											
<b>Usage Guidelines</b>	N/A											
<b>Examples</b>	<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								
<b>Error Messages</b>	'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.'											
<b>Related Commands</b>	N/A											



## Show IGMP Information of Router Port

### Commands

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

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	User EXEC Privileged EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<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>	
<b>Error Messages</b>	'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.'	
<b>Related Commands</b>	<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

<b>Syntax</b>	<b>show</b>	Display configuration/statistics/general information
<b>Description</b>	<b>vlan device info</b>	Display the VLAN device information
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC Mode.	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	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	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	moxa(config)# set gmrp enable	

## Show Port GMRP Information

### Commands

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

<b>Syntax Description</b>	<b>show</b>	Display configuration/statistics/general information
	<b>show vlan port config</b>	Display VLAN port configuration
	port interface-id	The input port number
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC Mode.	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<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>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	<pre> moxa(config)# set port gmrp enable moxa(config-if)# group restrict enable </pre>	

## Configure GMRP Global Setting

### Commands

**gmrp** { enable | disable }

<b>Syntax Description</b>	<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.
<b>Defaults</b>	Global GMRP is enabled by default	
<b>Command Modes</b>	Global Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# configure terminal moxa(config)# gmrp enable	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	moxa# show vlan device info	

## Configure GMRP Port Setting

### Commands

**gmrp**

**no gmrp**

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

## Configure GMRP Group Restricted Setting

### Commands

**group restricted** {enable | disable }

<b>Syntax Description</b>	<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
<b>Defaults</b>	GMRP group restriction is disabled by default	
<b>Command Modes</b>	Interface Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# configure terminal moxa(config)# interface ethernet 1/1 moxa(config-if)# group restricted	
<b>Error Messages</b>	Wrong interface type for port	
<b>Related Commands</b>	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>}]

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC User EXEC	
<b>Usage Guidelines</b>	Display static multicast address table	
<b>Examples</b>	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	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	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]

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC Global Configuration	
<b>Usage Guidelines</b>	Configure the static multicast address	
<b>Examples</b>	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	
<b>Error Messages</b>	"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."	
<b>Related Commands</b>	show mac-address-table static multicast	

# Network Redundancy

## Layer 2 Redundancy

### Spanning Tree

#### Enable/Disable Spanning Tree

##### Commands

**spanning-tree**

**no spanning-tree**

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

#### Configure Spanning Tree Compatibility

##### Commands

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

**no spanning-tree compatibility**

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

## Configure Spanning Tree Priority

### Commands

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

**no spanning-tree priority**

<b>Syntax Description</b>	<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
<b>Defaults</b>	The default priority is set to 32768	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	The "no spanning-tree priority" command will restore the default value	
<b>Examples</b>	moxa# configure terminal moxa(config)# spanning-tree priority 61440 moxa(config)# no spanning-tree priority	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	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**

<b>Syntax Description</b>	<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
<b>Defaults</b>	The default forwarding time is 15 seconds	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	Command "no spanning-tree forward-time" will reset to default value $2 * (\text{ForwardDelay} - 1) \geq \text{MaxAge} \geq 2 * (\text{Hello Time} + 1)$	
<b>Examples</b>	moxa# configure terminal moxa(config)# spanning-tree forward-time 16 moxa(config)# no spanning-tree forward-time	
<b>Error Messages</b>	% RSTP: $2 * (\text{Forward time} - 1) \geq \text{Max age time} \geq 2 * (\text{Hello time} + 1)$	
<b>Related Commands</b>	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**

<b>Syntax Description</b>	<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
<b>Defaults</b>	The default hello time is set to 2 seconds	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	The "no spanning-tree hello-time" command will restore the default value $2 * (\text{ForwardDelay} - 1) \geq \text{MaxAge} \geq 2 * (\text{Hello Time} + 1)$	
<b>Examples</b>	moxa# configure terminal moxa(config)# spanning-tree hello-time 1 moxa(config)# no spanning-tree hello-time	
<b>Error Messages</b>	% RSTP: $2 * (\text{Forward time} - 1) \geq \text{Max age time} \geq 2 * (\text{Hello time} + 1)$	
<b>Related Commands</b>	show spanning-tree show spanning-tree detail	

## Configure Spanning Tree Maximum Age

### Commands

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

**no spanning-tree max-age**

<b>Syntax Description</b>	<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
<b>Defaults</b>	The STP maximum age is set to 20 seconds by default	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	The "no spanning-tree max-age" command will restore the default value $2 * (\text{ForwardDelay} - 1) \geq \text{MaxAge} \geq 2 * (\text{Hello Time} + 1)$	
<b>Examples</b>	moxa# configure terminal moxa(config)# spanning-tree max-age 21 moxa(config)# no spanning-tree max-age	
<b>Error Messages</b>	% RSTP: $2 * (\text{Forward time} - 1) \geq \text{Max age time} \geq 2 * (\text{Hello time} + 1)$	
<b>Related Commands</b>	show spanning-tree show spanning-tree detail	

## Configure Spanning Tree Transmission Hold Counter

### Commands

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

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

<b>Syntax Description</b>	<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
<b>Defaults</b>	The STP hold counter is set to 6 by default	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	The "no spanning-tree transmit hold-count" command will restore the default value	
<b>Examples</b>	moxa# configure terminal moxa(config)# spanning-tree transmit hold-count 10 moxa(config)# no spanning-tree transmit hold-count	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	show spanning-tree detail	

## Configure Spanning Tree Auto-edge

### Commands

**spanning-tree auto-edge**

**no spanning-tree auto-edge**

<b>Syntax Description</b>	<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
<b>Defaults</b>	Spanning Tree auto-edge is enabled by default	
<b>Command Modes</b>	Interface Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# configure terminal moxa(config)# interface ethernet 1/1 moxa(config-if)# spanning-tree auto-edge moxa(config-if)# no spanning-tree auto-edge	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	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**

<b>Syntax Description</b>	<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
<b>Defaults</b>	The default path cost is set to 0	
<b>Command Modes</b>	Interface Configuration	
<b>Usage Guidelines</b>	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	
<b>Examples</b>	moxa# configure terminal moxa(config)# interface ethernet 1/1 moxa(config-if)# spanning-tree cost 20000 moxa(config-if)# no spanning-tree cost	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	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**

<b>Syntax Description</b>	<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
<b>Defaults</b>	The default Spanning Tree link-type is set to auto-detect	
<b>Command Modes</b>	Interface Configuration	
<b>Usage Guidelines</b>	The "no spanning-tree link-type" command will auto-detect the interface link type based on the port duplex mode	
<b>Examples</b>	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	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	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**

<b>Syntax Description</b>	<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
<b>Defaults</b>	Spanning Tree Portfast is disabled by default	
<b>Command Modes</b>	Interface Configuration	
<b>Usage Guidelines</b>	Shut down the interface before enabling the Portfast function The Portfast function cannot be enabled on a port that has loop guard enabled	
<b>Examples</b>	moxa# configure terminal moxa(config)# interface ethernet 1/1 moxa(config-if)# spanning-tree portfast moxa(config-if)# no spanning-tree portfast	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	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**

<b>Syntax Description</b>	<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
<b>Defaults</b>	The default Spanning Tree port priority is set to 128	
<b>Command Modes</b>	Interface Configuration	
<b>Usage Guidelines</b>	The "no spanning-tree port-priority" command will restore the default value	
<b>Examples</b>	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	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	show spanning-tree detail show spanning-tree interface ethernet 1/1 show spanning-tree interface ethernet 1/1 detail	

## Enable/Disable MSTP

### Commands

**mstp** { enable | disable }

<b>Syntax Description</b>	<b>mstp</b>	Configure MSTP related parameters
	enable	Enable MSTP
	disable	Disable MSTP
<b>Defaults</b>	Disabled	
<b>Command Modes</b>	Global Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# configure moxa(config)# mstp enable  moxa# configure moxa(config)# mstp disable	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Configure the Compatibility Version for Spanning Tree Protocol

### Commands

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

<b>Syntax Description</b>	<b>spanning-tree</b>	Configure the related spanning tree parameters
	<b>mst</b>	Multiple Spanning Tree
	<b>compatibility</b>	Spanning tree compatibility version
	stp	Spanning Tree Protocol configuration
	rstp	Rapid Spanning Tree configuration
	mstp	Multiple Spanning Tree
<b>Defaults</b>	Disabled	
<b>Command Modes</b>	Global Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# configure moxa(config)# spanning-tree mst compatibility mstp	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Remove Spanning Tree Protocol Compatibility

### Commands

**no spanning-tree mst compatibility**

<b>Syntax Description</b>	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>mst</b>	Multiple Spanning Tree
	<b>spanning-tree</b>	Configure the related spanning tree parameters
	<b>compatibility</b>	Spanning tree compatibility version
<b>Defaults</b>	mstp (if MSTP enabled) or rstp (if MSTP disabled)	
<b>Command Modes</b>	Global Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# configure moxa(config)# no spanning-tree compatibility	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Configure the Maximum Number of Hops Permitted in MST

### Commands

**spanning-tree mst max-hops** <short(6-40)>

<b>Syntax Description</b>	<b>spanning-tree</b>	Configure the related spanning tree parameters
	<b>mst</b>	Multiple Spanning Tree
	<b>max-hops</b>	Maximum number of hops allowed
	6-40	Value for maximum hops
<b>Defaults</b>	20	
<b>Command Modes</b>	Global Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# configure moxa(config)# spanning-tree mst max-hops 40	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Map VLANs to an MST Instance

### Commands

**spanning-tree mst instance** <short(1-16)> **vlan** <vlan\_range> [**priority** <short(0 -61440)>]

<b>Syntax Description</b>	<b>spanning-tree</b>	Configure the related spanning tree parameters
	<b>mst</b>	Multiple Spanning Tree
	<b>instance</b>	An MST instance
	(1-16)	Value for maximum hops
	<b>vlan</b>	VLAN range associated with a spanning tree instance
	<vlan-range>	Range (1-4094) of VLANs separated by a hyphen, or a series of VLANs separated by a comma
<b>priority</b>	Switch priority configuration for spanning tree instance	
	(0-61440)	Priority value
<b>Defaults</b>	20	
<b>Command Modes</b>	Global Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# configure moxa(config)# spanning-tree mst instance 2 vlan 5-10  moxa(config)# spanning tree mst instance 3 vlan 15-50 priority 4096	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	



### Note

The maximum instances vary on the number of targets.

## Delete the MST Instance or Remove VLANs from MST Instance

### Commands

**no spanning-tree mst instance** <short(1-16)> [**vlan** <vlan\_range >]

<b>Syntax Description</b>	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>spanning-tree</b>	Configure the related spanning tree parameters
	<b>mst</b>	Multiple Spanning Tree
	<b>instance</b>	An MST instance
	(1-16)	Instance ID
	<b>vlan</b>	VLAN range associated with a spanning tree instance
<vlan-range>	Range (1-4094) of VLANs separated by a hyphen, or a series of VLANs separated by a comma	
<b>Defaults</b>	No	
<b>Command Modes</b>	Global Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# configure moxa(config)# no spanning-tree mst instance 2  moxa(config)# no spanning tree mst instance 1 vlan 5	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Configure Bridge Priority for Spanning Tree

### Commands

**spanning-tree mst** {**instance** <short(1-16)> | **cist**} **priority** <short(0 -61440)>

<b>Syntax Description</b>	<b>spanning-tree</b>	Configure the related spanning tree parameters
	<b>mst</b>	Multiple Spanning Tree
	<b>instance</b>	An MST instance
	(1-16)	Instance ID
	<b>cist</b>	Common Internal Spanning Tree
	<b>priority</b>	Switch priority configuration for spanning tree instance
(0-61440)	Priority value	
<b>Defaults</b>	Priority: 32768	
<b>Command Modes</b>	Global Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# configure moxa(config)# spanning-tree mst instance 1 priority 28672	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Reset Bridge Priority for the Spanning Tree to Its Default Value

### Commands

**no spanning-tree mst** {instance <short(1-16)> | cist} priority

<b>Syntax Description</b>	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>spanning-tree</b>	Configure the related spanning tree parameters
	<b>mst</b>	Multiple Spanning Tree
	<b>instance</b>	An MST instance
	(1-16)	Instance ID
	<b>cist</b>	Common Internal Spanning Tree
	<b>priority</b>	Switch priority configuration for spanning tree instance
<b>Defaults</b>	Priority: 32768	
<b>Command Modes</b>	Global Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# configure moxa(config)# no spanning-tree mst instance 1 priority	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Set Up Spanning Tree MST Configuration Name

### Commands

**spanning-tree mst** { name <string(32)> | revision <short(0-65535)> }

<b>Syntax Description</b>	<b>spanning-tree</b>	Configure the related spanning tree parameters
	<b>mst</b>	Multiple Spanning Tree
	<b>name</b>	Configure name for the MST region
	<string(32)>	Configuration name
	<b>revision</b>	Configure revision name for the MST region
	(0-65535)	Revision number for the MST region
<b>Defaults</b>	Name: MAC address, Revision: 0	
<b>Command Modes</b>	Global Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# configure moxa(config)# spanning-tree mst name MSTP moxa(config)#spanning-tree mst revision 20	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	



## Delete Spanning Tree MST Configuration Name

### Commands

**no spanning-tree mst { name | revision }**

<b>Syntax Description</b>	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>spanning-tree</b>	Configure the related spanning tree parameters
	<b>mst</b>	Multiple Spanning Tree
	<b>name</b>	Configuration name
	<b>revision</b>	Configure revision number for the MST region
<b>Defaults</b>	Name: MAC address, Revision: 0	
<b>Command Modes</b>	Global Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# configure moxa(config)# no spanning-tree mst name moxa(config)# no spanning-tree mst revision	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Configure MSTP Timer

### Commands

**spanning-tree mst { forward-time <seconds(4-30)> | hello-time <seconds(1-2)> | max-age <seconds(6-40)> }**

<b>Syntax Description</b>	<b>spanning-tree</b>	Configure the related spanning tree parameters
	<b>mst</b>	Multiple Spanning Tree
	<b>forward-time</b>	Interval (in seconds) until which a port stays in a state before moving to next state
	(4-30)	Forward delay value
	<b>hello-time</b>	Interval (in seconds) between the transmission of configuration BPDUs
	(1-2)	Hello time value
	<b>max-age</b>	Maximum age (in seconds) for learnt STP information before discarding
(6-40)	Value representing maximum age	
<b>Defaults</b>	forward time: 15, hello-time: 2, max-age: 20	
<b>Command Modes</b>	Global Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# configure moxa-(config)# spanning-tree mst forward-time 16 moxa-(config)# spanning-tree mst hello-time 1 moxa-(config)# spanning-tree mst max-age 30	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Reset the MSTP Timer to the Default Value

### Commands

**no spanning-tree mst { forward-time | hello-time | max-age }**

<b>Syntax Description</b>	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>spanning-tree</b>	Configure the related spanning tree parameters
	<b>mst</b>	Multiple Spanning Tree
	<b>forward-time</b>	Interval (in seconds) until which a port stays in a state before moving to next state
	<b>hello-time</b>	Interval (in seconds) between the transmission of configuration BPDUs
	<b>max-age</b>	Maximum age (in seconds) for learnt STP information before discarding
<b>Defaults</b>	forward time: 15, hello-time: 2, max-age: 20	
<b>Command Modes</b>	Global Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# configure moxa-(config)# no spanning-tree mst forward-time moxa-(config)# no spanning-tree mst hello-time moxa-(config)# no spanning-tree mst max-age	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Enable Spanning Tree MST Instance on This Port

### Commands

**spanning-tree mst { instance <short(1-16)> | cist | all }**

<b>Syntax Description</b>	<b>spanning-tree</b>	Configure the related spanning tree parameters
	<b>mst</b>	Multiple Spanning Tree
	<b>instance</b>	An MST instance
	(1-16)	Instance ID
	<b>cist</b>	Common Internal Spanning Tree
	<b>all</b>	All instances on the device including CIST
<b>Defaults</b>	Disabled	
<b>Command Modes</b>	Interface Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# configure moxa(config)# interface ethernet 1/1 moxa(config-if)# spanning-tree mst instance 1	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Disable Spanning Tree MST Instance on This Port

### Commands

```
no spanning-tree mst { instance <short(1-16)> | cist | all }
```

<b>Syntax Description</b>	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>spanning-tree</b>	Configure the related spanning tree parameters
	<b>mst</b>	Multiple Spanning Tree
	<b>instance</b>	An MST instance
	(1-16)	Instance ID
	<b>cist</b>	Common Internal Spanning Tree
	<b>all</b>	All instances on the device including CIST
<b>Defaults</b>	Disabled	
<b>Command Modes</b>	Interface Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# configure moxa(config)# interface ethernet 1/1 moxa(config-if)# no spanning-tree mst instance 1	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Configure Spanning Tree Properties of an Interface for MSTP

### Commands

```
spanning-tree mst {instance <short(1-16)> | cist } { cost <integer(1-200000000)> | port-priority <short(0-240)> }
```

<b>Syntax Description</b>	<b>spanning-tree</b>	Configure the related spanning tree parameters
	<b>mst</b>	Multiple Spanning Tree
	<b>instance</b>	An MST instance
	(1-16)	Instance ID
	<b>cist</b>	Common Internal Spanning Tree
	<b>cost</b>	The cost associate with the port
	(1-200000000)	The cost value associated with the port
	<b>port-priority</b>	Port priority
(0-240)	Port priority value	
<b>Defaults</b>	cost: 0, port-priority: 128	
<b>Command Modes</b>	Interface Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# configure moxa(config)# interface ethernet 1/1 moxa(config-if)# spanning-tree mst instance 1 cost 200 moxa(config-if)# spanning-tree mst instance 1 port-priority 144	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Reset Spanning Tree Properties of an Interface to Default Value

### Commands

**no spanning-tree mst** { **instance** <short(1-16)> | **cist** } {**cost** | **port-priority** }

<b>Syntax Description</b>	<b>No</b>	Remove configuration/delete entry/reset to default value
	<b>spanning-tree</b>	Configure the related spanning tree parameters
	<b>Mst</b>	Multiple Spanning Tree
	<b>instance</b>	An MST instance
	(1-16)	Instance ID
	<b>Cist</b>	Common Internal Spanning Tree
	<b>cost</b>	The cost associate with the port
<b>port-priority</b>	Port priority	
<b>Defaults</b>	cost: 0, port-priority: 128	
<b>Command Modes</b>	Interface Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# configure moxa(config)# interface ethernet 1/1 moxa(config-if)# no spanning-tree mst instance 1 cost moxa(config-if)# no spanning-tree mst instance 1 port-priority	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Show Multiple Spanning Tree Information

### Commands

**show spanning-tree mst** [**instance** <short(1-16)>] [**detail**]

<b>Syntax Description</b>	<b>show</b>	Display configuration/status information
	<b>spanning-tree</b>	Configure the related spanning tree parameters
	<b>mst</b>	Multiple Spanning Tree
	<b>instance</b>	An MST instance
	(1-16)	Instance ID
	<b>detail</b>	Detailed information for the spanning tree mst instance
	<b>Defaults</b>	N/A
<b>Command Modes</b>	Privileged EXEC Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# show spanning-tree mst moxa# show spanning-tree mst detail moxa# show spanning-tree mst instance 1 moxa# show spanning-tree mst instance 1 detail	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Show Multiple Spanning Tree Instance Configuration

### Commands

**show spanning-tree mst configuration**

<b>Syntax Description</b>	<b>show</b>	Display configuration/status information
	<b>spanning-tree</b>	Configure the related spanning tree parameters
	<b>mst</b>	Multiple spanning tree instance
	<b>configuration</b>	Multiple spanning tree instance configuration
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# show spanning-tree mst configuration	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Show Multiple Spanning Tree Port Specific Configuration

### Commands

**show spanning-tree mst [instance <short(1-16)>] interface { <iftyp> <ifnum> | port-channel <integer> } [{ stats | detail }]**

<b>Syntax Description</b>	<b>show</b>	Display configuration/status information
	<b>spanning-tree</b>	Configure the related spanning tree parameters
	<b>mst</b>	Multiple Spanning Tree
	<b>instance</b>	An MST instance
	(1-16)	Instance ID
	<b>interface</b>	Detailed information for the spanning tree mst instance
	iftyp	Interface type
	ifnum	Interface ID
	<b>port-channel</b>	Port channel interface
	integer	Port channel ID
	<b>stats</b>	Input and output packets by switching path for the interface
	<b>detail</b>	Detailed multiple spanning tree port specific configuration
	<b>Defaults</b>	N/A
<b>Command Modes</b>	Privileged EXEC Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# show spanning-tree mst interface ethernet 1/1 moxa# show spanning-tree mst interface port-channel 1  moxa# show spanning-tree mst instance 1 interface ethernet 1/1 moxa# show spanning-tree mst instance 1 interface port-channel 1  moxa# show spanning-tree mst interface ethernet 1/1 stats moxa# show spanning-tree mst interface port-channel 1 detail  moxa# show spanning-tree mst instance 1 interface ethernet 1/1 stats moxa# show spanning-tree mst instance 1 interface port-channel 1 detail	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Configure Spanning Tree BPDU Guard

### Commands

**spanning-tree bpduguard**

**no spanning-tree bpduguard**

<b>Syntax Description</b>	<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
<b>Defaults</b>	Spanning Tree BPDU guard is disabled by default	
<b>Command Modes</b>	Interface Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# configure terminal moxa(config)# interface ethernet 1/1 moxa(config-if)# spanning-tree bpduguard moxa(config-if)# no spanning-tree bpduguard	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	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**

<b>Syntax Description</b>	<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
<b>Defaults</b>	Spanning Tree BPDU filtering is disabled by default	
<b>Command Modes</b>	Interface Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# configure terminal moxa(config)# interface ethernet 1/1 moxa(config-if)# spanning-tree bpdfilter moxa(config-if)# no spanning-tree bpdfilter	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	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**

<b>Syntax Description</b>	<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
<b>Defaults</b>	Spanning Tree root guard is disabled by default	
<b>Command Modes</b>	Interface Configuration	
<b>Usage Guidelines</b>	The Root guard function cannot be enabled on a port that has loop guard enabled	
<b>Examples</b>	moxa# configure terminal moxa(config)# interface ethernet 1/1 moxa(config-if)# spanning-tree rootguard moxa(config-if)# no spanning-tree rootguard	
<b>Error Messages</b>	% RSTP: loopGuard and rootGuard should be exclusive	
<b>Related Commands</b>	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**

<b>Syntax Description</b>	<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
<b>Defaults</b>	Spanning Tree loop guard is disabled by default	
<b>Command Modes</b>	Interface Configuration	
<b>Usage Guidelines</b>	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	
<b>Examples</b>	moxa# configure terminal moxa(config)# interface ethernet 1/1 moxa(config-if)# spanning-tree loopguard moxa(config-if)# no spanning-tree loopguard	
<b>Error Messages</b>	% RSTP: loopGuard and rootGuard should be exclusive	
<b>Related Commands</b>	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**

<b>Syntax Description</b>	<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
<b>Defaults</b>	The default error-disabled recovery interval is set to 300 seconds	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# spanning-tree errordisable recovery-interval 30	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	show spanning-tree detail	

## Clear Spanning Tree Detected Protocols

### Commands

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

<b>Syntax Description</b>	<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	
<b>Defaults</b>	N/A	
<b>Command Modes</b>	User EXEC mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# clear spanning-tree detected protocols interface ethernet 1/1 moxa# clear spanning-tree detected protocols interface port-channel 1	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	



## Show Spanning Tree Bridge Information

### Commands

**show spanning-tree bridge**

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

## Show Spanning Tree Root Information

### Commands

**show spanning-tree root**

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

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	User EXEC Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<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>	
	<pre> Root      State      Cost      Prio  Type -----  -----  -----  ----  ----- Disabled  Disable    200000000  128   SharedLAN</pre> <pre> moxa# show span in eth 1/1 incon BPDU Inconsist: False Root Inconsist: False Loop Inconsist: False  moxa#</pre>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Show Spanning Tree Details

### Commands

**show spanning-tree** [detail]

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

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	User EXEC Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<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       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>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Turbo Ring v2

### Show Turbo Ring v2 Status

#### Commands

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

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	User EXEC/Privileged EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<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>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	turbo-ring-v2	

## Configure Redundancy Mode Setting

### Commands

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

<b>Syntax Description</b>	<b>turbo-ring-v2</b>	Configure Turbo Ring V2 parameters
	enable	Enable Turbo Ring V2
	disable	Disable Turbo Ring V2
<b>Defaults</b>	Turbo Ring V2 is disabled by default	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# turbo-ring-v2 enable	
<b>Error Messages</b>	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.	
<b>Related Commands</b>	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

<b>Syntax Description</b>	<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 interface</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 interface</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	
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	At least one turbo ring domain or coupling must be enabled. Two turbo ring domains and coupling cannot be enabled at the same time.	
<b>Examples</b>	moxa(config)# turbo-ring-v2 1 primary interface ethernet 2/1 secondary interface ethernet 2/2	
<b>Error Messages</b>	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.	
<b>Related Commands</b>	show turbo-ring-v2 { config   status }	

## Configure the Switch as the Ring Master

### Commands

**turbo-ring-v2 ring-id master**

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

<b>Syntax Description</b>	<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>master</b>	Enable ring master
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# turbo-ring-v2 1 master master - Set turbo ring v2 ring id as master	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	show turbo-ring-v2 { config   status }	

## Configure the Primary Port of Ring Coupling

### Commands

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

**no turbo-ring-v2 coupling**

<b>Syntax Description</b>	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>turbo-ring-v2</b>	Configure Turbo Ring V2 parameters
	<b>coupling</b>	Configure ring coupling parameters
	<b>primary</b>	Coupling primary mode
	<b>interface</b>	The port interface
	interface-type	Ethernet
	interface-id	The slot number/port number <1-7>/<1-4>
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	At least one turbo ring domain or coupling must be enabled. Two turbo ring domains and coupling cannot be enabled at the same time.	
<b>Examples</b>	moxa(config)# turbo-ring-v2 coupling primary interface ethernet 2/1	
<b>Error Messages</b>	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.	
<b>Related Commands</b>	show turbo-ring-v2	

## Configure Backup Port of Ring Coupling

### Commands

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

**no turbo-ring-v2 coupling**

<b>Syntax Description</b>	<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>
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	At least one turbo ring domain or coupling must be enabled. Two turbo ring domains and coupling cannot be enabled at the same time.	
<b>Examples</b>	moxa(config)# turbo-ring-v2 coupling backup interface ethernet 2/1	
<b>Error Messages</b>	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.	
<b>Related Commands</b>	show turbo-ring-v2 { config   status }	

## Turbo Chain

### Show Turbo Chain Information

#### Commands

**show turbo-chain**

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

<b>Syntax Description</b>	<b>turbo-chain</b>	Configure Turbo Chain parameters
	enable	Enable Turbo Chain
	disable	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 interface</b>	Configure the Turbo Chain primary port
		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 interface</b>	Configure the Turbo Chain secondary port
	The interface of Turbo Chain	
<b>Defaults</b>	Turbo Chain is disabled by default	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<pre>moxa(config)# turbo-chain disable moxa(config)# turbo-chain role member primary interface ethernet 1/1 secondary interface ethernet 1/2</pre>	
<b>Error Messages</b>	<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>	
<b>Related Commands</b>	show turbo-chain	



## Dual Homing

### Show Dual Homing Information

#### Commands

**show dual-homing**

<b>Syntax Description</b>	<b>show</b>	Show running system information
	<b>dual-homing</b>	Display dual homing configurations and status
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC/User EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	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	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	dual-homing	

### Enable/Disable Dual Homing Setting

#### Commands

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

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

### Configure Dual Homing Path Mode

#### Commands

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

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	redundancy configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# dual-homing path-mode primary-first	
<b>Error Messages</b>	N/A	
<b>Command Modes</b>	N/A	
<b>Related Commands</b>	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>}

<b>Syntax Description</b>	<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	
<b>Defaults</b>	N/A	
<b>Command Modes</b>	redundancy configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa (config)# dual-homing primary interface ethernet 1/1 secondary interface port-channel 1	
<b>Error Messages</b>	N/A	
<b>Command Modes</b>	N/A	
<b>Related Commands</b>	show dual-homing	

## MRP

### Show MRP Information

#### Commands

**show mrp**

<b>Syntax</b>	show	Display configuration/statistics/general information
	mrp	Display MRP information
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC/ User EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	MOXA# show mrp  MRP Ring : Enabled Role : Ring Manager Ring State Machine : Primary Ring Port Link Up React on link Change : Enabled VLAN ID : 1 Domain ID : C3D687FE-789E-03A1-ACDB-E5BFCBBC27B6 ----- Interface Port Number Port Status ----- Primary Port Eth1/3 Forwarding Secondary Port Eth1/4 Link down	
<b>Error messages</b>	N/A	
<b>Related commands</b>	N/A	

### Enable/Disable the MRP Ring

#### Commands

**mrp ring { enable | disable }**

<b>Syntax</b>	<b>mrp</b>	Configure MRP settings
	<b>ring</b>	Configure MRP ring settings
	enable	Enable the MRP ring
	disable	Disable the MRP ring
<b>Defaults</b>	The MRP ring is disabled by default.	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	Product(config)# mrp ring enable	
<b>Error messages</b>	% L2 Redundancy: Invalid: A maximum of two redundant protocols can be enabled. % L2 Redundancy: Invalid: Turbo Ring V2 and MRP can not be enabled at the same time. % L2 Redundancy: Invalid: Turbo Chain and MRP can not be enabled at the same time. % L2 Redundancy: Invalid: STP/RSTP/MSTP and MRP can not be enabled at the same time.	
<b>Related commands</b>	show mrp	

### Configure MRP Role Settings

#### Commands

**mrp role { manager | client }**

<b>Syntax Description</b>	<b>mrp</b>	Configure MRP settings
	<b>role</b>	Configure MRP role settings
	manager	Set the MRP role to Manager
	client	Set the MRP role to Client
<b>Defaults</b>	The default MRP role is Client.	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	Product(config)# mrp role manager	
<b>Error messages</b>	N/A	
<b>Related commands</b>	show mrp	

## Configure MRP Ring VLAN ID

### Commands

**mrp ring vlan-id** <integer(1-4094)>

<b>Syntax Description</b>	<b>mrp</b>	Configure MRP settings
	<b>ring</b>	Configure MRP ring settings
	<b>vlan-id</b>	Configure the MRP VLAN ID
	<integer(1-4094)>	Specify the MRP VLAN ID (1-4094)
<b>Defaults</b>	The default MRP VLAN ID is 1.	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	Product(config)# mrp ring vlan-id 10	
<b>Error messages</b>	N/A	
<b>Related commands</b>	show mrp	

## Configure MRP Ring Domain Settings

### Commands

**mrp ring domain** { default | profinet }

<b>Syntax Description</b>	<b>mrp</b>	Configure MRP settings
	<b>ring</b>	Configure the MRP ring settings
	<b>domain</b>	Configure domain UUID settings
	default	Set the domain UUID to the default UUID
	profinet	Set the domain UUID to the PROFINET UUID
<b>Defaults</b>	The default Domain UUID is the Default UUID.	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	Product(config)# mrp ring domain profinet	
<b>Error messages</b>	N/A	
<b>Related commands</b>	show mrp	

## Enable/Disable MRP React-on-Link Change

### Commands

**mrp react-on-lnk-chg** { enable | disable }

<b>Syntax Description</b>	<b>mrp</b>	Configure MRP settings
	<b>react-on-lnk-chg</b>	Configure MRP react on MRC link change settings
	enable	Enable MRP react on link change
	disable	Disable MRP react on link change
<b>Defaults</b>	Enabled	

<b>Command Modes</b>	Global configuration
<b>Usage Guidelines</b>	N/A
<b>Examples</b>	Product(config)# mrp react-on-lnk-chg enable
<b>Error messages</b>	N/A
<b>Related commands</b>	show mrp

## Configure MRP Primary/Secondary Interface Settings

### Commands

**mrp primary interface** <iftype> <ifnum> **secondary interface** <iftype> <ifnum>

<b>Syntax Description</b>	<b>mrp</b>	Configure MRP settings
	<b>primary interface</b>	Configure MRP primary interface settings
	<iftype> <ifnum>	Specify the interface type and number (Ethernet, 1/1)
	<b>secondary interface</b>	Configure MRP secondary interface settings
	<iftype> <ifnum>	Specify the interface type and number (Ethernet, 1/1)
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	Product(config)# mrp primary interface 1/1 secondary interface 1/2	
<b>Error messages</b>	N/A	
<b>Related commands</b>	show mrp	

# Management

## Network Management

### SNMP

#### Configure SNMP Server Access Mode

##### Commands

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

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

## Configure SNMP Server Read-Only Community Settings

### Commands

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

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

## Delete SNMP Server Read-Only Community

### Commands

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

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# no snmp-server community read-only	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	snmp-server show snmp-server	

## Configure SNMP Server Read-Write Community Settings

### Commands

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

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

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

### Commands

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

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# no snmp-server community read-write	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	snmp-server show snmp-server	

## Configure SNMP Server Version

### Commands

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

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

## Configure SNMP Server Version to Default Value

### Commands

**no snmp-server version**

<b>Syntax Description</b>	<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
<b>Defaults</b>	The default SNMP server version is set to v1-v2c	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# no snmp-server version	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	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)>]

<b>Syntax Description</b>	<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	
<b>Defaults</b>	There is no user account table by default	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	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.	
<b>Examples</b>	<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 1111111111 encryption disable moxa(config)# moxa(config)# moxa(config)# snmp-server user testAuthPriv authority read-write auth-type md5 auth-passwd 1111111111 encryption des encryption-key 2222222222 moxa(config)# moxa(config)#</pre>	
<b>Error Messages</b>	<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') % Can't create user account % Can't modify user account</pre>	
<b>Related Commands</b>	<pre>snmp-server show snmp-server</pre>	

## Delete SNMP Server User Account

### Commands

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

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# no snmp-server user testNoAuthNoPriv moxa(config)# no snmp-server user testAuthNoPriv moxa(config)# no snmp-server user testAuthPriv	
<b>Error Messages</b>	% 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	
<b>Related Commands</b>	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)>]

<b>Syntax Description</b>	<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	
<b>Defaults</b>	There is no SNMP trap host entry by default	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	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.	
<b>Examples</b>	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	
<b>Error Messages</b>	% 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 inform-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	
<b>Related Commands</b>	snmp-trap show snmp-trap	

## Delete SNMP Trap Host Entry

### Commands

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

<b>Syntax Description</b>	<b>no</b>	Disable the configuration/delete the entry/reset to default value
	<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>Defaults</b>	N/A	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# no snmp-trap host 192.168.127.254 moxa(config)# no snmp-trap host 192.168.127.253	
<b>Error Messages</b>	% 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	
<b>Related Commands</b>	snmp-trap show snmp-trap	

## Configure SNMP Trap Inform Retry Setting

### Commands

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

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

## Reset SNMP Trap Inform Retry to Default Value

### Commands

**no snmp-trap inform-retries**

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# no snmp-trap inform-retries	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	snmp-trap show snmp-trap	

## Configure SNMP Trap Inform Timeout Setting

### Commands

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

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

## Reset SNMP Trap Inform Timeout to Default Value

### Commands

**no snmp-trap inform-timeout**

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# no snmp-trap inform-timeout	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	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)>]

<b>Syntax Description</b>	<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	
<b>Defaults</b>	There is no user account table by default	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	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.	
<b>Examples</b>	<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>	
<b>Error Messages</b>	<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>	
<b>Related Commands</b>	<pre>snmp-trap show snmp-trap</pre>	

## Delete SNMP Trap User Account

### Commands

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

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# no snmp-trap user test	
<b>Error Messages</b>	% 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	
<b>Related Commands</b>	snmp-trap show snmp-trap	

## Show SNMP Server Information

### Commands

**show snmp-server information**

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

## Show SNMP Server User Account Information

### Commands

**show snmp-server user**

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	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	
<b>Error Messages</b>	% Can't get snmp-server user-account information % Can't get snmp-server user-account table	
<b>Related Commands</b>	snmp-server	

## Show SNMP Server Engine ID Information

### Commands

**show snmp-server engine-id**

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

## SNMP Trap/Inform

### Show SNMP Trap Information

#### Commands

##### show snmp-trap information

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

### Show SNMP Trap User Account Information

#### Commands

##### show snmp-trap user

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# show snmp-trap user ----- snmp-trap user-account : 1 ----- user-name : testNoAuthNoPriv authenticate-type : none encryption-method : disable	
<b>Error Messages</b>	% 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')	
<b>Related Commands</b>	snmp-trap	



## Show SNMP Trap Host Information

### Commands

#### show snmp-trap host

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	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 :	
<b>Error Messages</b>	% Can't get snmp-trap host information % Can't get snmp-trap host table % Can't get snmp-trap host table index('%d')	
<b>Related Commands</b>	snmp-trap	

# Security

## Device Security

### Management Interface

#### Enable Network Server

##### Commands

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

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

#### Disable Network Server

##### Commands

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

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

## Configure Network Port Numbers

### Commands

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

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

## Configure SNMP Server Port Number

### Commands

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

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

## Configure Network Maximum Session Numbers

### Commands

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

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

## Configure Network Terminal Maximum Session Numbers

### Commands

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

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

## Show Network Service Information

### Commands

**show ip service information**

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	User EXEC Privileged EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	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	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Login Policy

### Configure Login Lockout Settings

#### Commands

**login lockout** <enable|disable>

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

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	(config)# login lockout 10 attempts 5 (config)# login lockout enable (config)# login lockout disable	
<b>Error messages</b>	N/A	
<b>Related commands</b>	N/A	

### Configure Login Banner

#### Commands

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

**no login banner**

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	(config)# login banner "this is a banner" (config)# no login banner	
<b>Error messages</b>	N/A	
<b>Related commands</b>	N/A	

## Configure Login Failure Message

### Commands

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

**no login fail-message**

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	(config)# login fail-message "this is a failure message" (config)# no login fail-message	
<b>Error messages</b>	N/A	
<b>Related commands</b>	N/A	

## Configure Timeout Value for a Session End

### Commands

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

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

## Show Session Timeout Information

### Commands

**show session timeout**

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

## Show Login Failure Message

### Commands

show login fail-message

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

## Show Login Banner

### Commands

show login banner

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

## Show Login Authentication

### Commands

show login authentication

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

## Trusted Access

### Configure Trusted Access Settings

#### Commands

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

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

<b>Syntax Description</b>	<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
	uicast_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
<b>Defaults</b>	Trusted access is disabled by default	
<b>Command Modes</b>	Privileged EXEC Global Configuration	
<b>Usage Guidelines</b>	Trusted access will take effect when the "trusted-access enable" command is executed.	
<b>Examples</b>	(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	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	show trusted-access trusted-access enable	

### Enable/Disable IP Trusted Access List

#### Commands

**trusted-access** <enable>

**trusted-access** <disable>

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



## Show Trusted Access IP List

### Commands

show trusted-access

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

## SSH & SSL

### Re-generate New Web SSL Certificate

#### Commands

web certificate generate

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

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

#### Commands

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

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	(config)# web certificate import tftp://192.168.1.1/server.crt	
<b>Error messages</b>	Format or Password Error	
	Server not Connected	
<b>Related commands</b>	N/A	

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

### Commands

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

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	(config)# web signing-request export tftp://192.168.1.1/server.csr	
<b>Error Messages</b>	Server not Connected	
<b>Related Commands</b>	N/A	

## Re-generate New SSH Key

### Commands

**ssh key generate**

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

## Network Security

### IEEE 802.1X

#### Configure Local Authentication Mode

### Commands

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

<b>Syntax Description</b>	<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
<b>Defaults</b>	The default authentication mode is set to local	
<b>Command Modes</b>	Global configuration mode	
<b>Usage Guidelines</b>	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.	
<b>Examples</b>	moxa(config)# dot1x aaa auth radius	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Enable/Disable IEEE 802.1X Function

### Commands

**dot1x** { enable | disable }

<b>Syntax Description</b>	<b>dot1x</b>	Configure IEEE 802.1X port-based network access control
	enable	Enable dot1x authentication
	disable	Disable dot1x authentication
<b>Defaults</b>	Dot1x authentication is disabled by default	
<b>Command Modes</b>	Global configuration mode	
<b>Usage Guidelines</b>	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.	
<b>Examples</b>	moxa (config)# dot1x enable	
<b>Error Messages</b>	{{!s}} and 802.1x/MAB cannot be enabled at the same port. Invalid: If 802.1x port is enabled, the port security port cannot be enabled. Invalid: If the port is in port-channel, it cannot enable dot1x.	
<b>Related Commands</b>	N/A	

## Configure IEEE 802.1X on the Port

### Commands

**dot1x**

**no dot1x**

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

## Authorize IEEE 802.1X

### Commands

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

**no dot1x port-control**

<b>Syntax Description</b>	<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.
<b>Defaults</b>	The default port-control mode is set to force-authorized	
<b>Command Modes</b>	Interface Configuration Mode	
<b>Usage Guidelines</b>	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.	
<b>Examples</b>	moxa (config-if)# dot1x port-control auto moxa (config-if-range)# dot1x port-control auto	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Configure Maximum Number of EAP

### Commands

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

**no dot1x max-req**

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

## Configure IEEE 802.1X Reauthentication

### Commands

**dot1x reauthentication**

**no dot1x reauthentication**

<b>Syntax Description</b>	<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
<b>Defaults</b>	Dot1x reauthentication is disabled by default	
<b>Command Modes</b>	Interface Configuration Mode.	
<b>Usage Guidelines</b>	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.	
<b>Examples</b>	moxa (config-if)# dot1x reauthentication moxa (config-if-range)# dot1x reauthentication	
<b>Error Messages</b>	Invalid: If port Control mode is not Auto, Reauthentication cannot be enabled.	
<b>Related Commands</b>	dot1x timeout – Sets the dot1x timers dot1x port-control – Configures the authenticator port control parameter	

## Reauthenticate IEEE 802.1X on the Port

### Commands

**dot1x re-authenticate**

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC Mode	
<b>Usage Guidelines</b>	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).	
<b>Examples</b>	moxa (config-if) # dot1x re-authenticate moxa (config-if-range) # dot1x re-authenticate	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Configure IEEE 802.1X 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 }

<b>Syntax Description</b>	<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
	no	Set the dot1x timers to their default values
<b>Defaults</b>	quiet-period: 60 seconds reauth-period: 3600 seconds server-timeout: 30 seconds supp-timeout: 30 seconds tx-period: 30 seconds	
<b>Command Modes</b>	Interface configuration mode	
<b>Usage Guidelines</b>	This command sets the dot1x timers.	
<b>Examples</b>	moxa (config-if)# dot1x timeout quiet-period 30 moxa (config-if-range)# dot1x timeout quiet-period 30	
<b>Error Messages</b>	Invalid input detected at '^' marker	
<b>Related Commands</b>	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 IEEE 802.1X Information

### Commands

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

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC Mode	
<b>Usage Guidelines</b>	This command displays dot1x information.	
<b>Examples</b>	<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>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	<pre> 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 </pre>	

## Configure IEEE 802.1X 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 ]

<b>Syntax Description</b>	<b>dot1x</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>Defaults</b>	N/A	
<b>Command Modes</b>	Global configuration mode	
<b>Usage Guidelines</b>	This command configures the RADIUS client with the host, timeout, key, retransmit parameters.	
<b>Examples</b>	moxa (config)# dot1x auth radius-server host 6.7.8.9 auth-port 1812 timeout 3 retransmit 1 key 123456 primary	
<b>Error Messages</b>	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.	
<b>Related Commands</b>	N/A	

## Configure IEEE 802.1X Username and Password

### Commands

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

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

<b>Syntax Description</b>	<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>Defaults</b>	N/A	
<b>Command Modes</b>	Global configuration mode	
<b>Usage Guidelines</b>	This command configures dot1x authentication server local database username and password entries.	
<b>Examples</b>	moxa (config)# dot1x local-database user password 123456	
<b>Error Messages</b>	Invalid: This 'Username' is already in the 'Local Database'.	
<b>Related Commands</b>	N/A	



## Show IEEE 802.1X Authentication RADIUS Server

### Commands

**show dot1x auth radius server**

<b>Syntax Description</b>	<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.
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC Mode	
<b>Usage Guidelines</b>	This command displays radius server information.	
<b>Examples</b>	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 -----	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## MAB

### Enable/Disable MAC Authentication Bypass

#### Commands

**mab** {enable | disable}

<b>Syntax Description</b>	<b>mab</b>	Configure MAB parameters
	enable	Enable MAB on the switch
	disable	Disable MAB on the switch
<b>Defaults</b>	Disable	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# mab enable moxa(config)# mab disable	
<b>Error messages</b>	N/A	
<b>Warning messages</b>	N/A	
<b>Related commands</b>	show mab	

### Configure MAB Authentication Settings

#### Commands

**mab aaa auth** {radius | local}

<b>Syntax Description</b>	<b>mab</b>	Configure MAB parameters
	aaa	Configure AAA services related parameters
	auth	Authentication related configuration
	radius	Configure RADIUS as the authentication mode
	local	Configure local database as the authentication mode
<b>Defaults</b>	Local-database	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# mab aaa auth radius moxa(config)# mab aaa auth local	
<b>Error messages</b>	N/A	
<b>Warning messages</b>	N/A	
<b>Related commands</b>	show mab	

### Enable/Disable MAB on a Port

#### Commands

**mab**

**no mab**

<b>Syntax Description</b>	<b>no</b>	Remove configuration / delete entry / reset to default value
	<b>mab</b>	Enable/Disable MAB on an interface
<b>Defaults</b>	Disable	
<b>Command Modes</b>	Interface Configuration	
<b>Usage Guidelines</b>	`no mab` will invalid HW operation but keep the configuration on a port.	
<b>Examples</b>	<pre>moxa(config-if)# mab moxa(config-if)# no mab</pre>	
<b>Error messages</b>	<pre>moxa(config-if)# mab</pre> <p>Cannot enable MAB while &lt; Link Aggregation, RSTP, MSTP, Dual-Homing, Turbo Ring v2, Turbo Chain, 802.1X, Port Security&gt; be enabled.</p> <pre>moxa(config)# mac-address-table static unicast 00:00:00:00:00:03 vlan 1 set interface ethernet 1/1 moxa(config)# interface ethernet 1/1 moxa(config-if)# mab</pre> <p>Cannot enable MAB on an interface while it's configured as forwarding port in static unicast table.</p>	
<b>Warning messages</b>	N/A	
<b>Related commands</b>	show mab	

## Enable/Disable MAB Reauthentication

### Commands

**mab reauthentication**

**no mab reauthentication**

<b>Syntax Description</b>	<b>no</b>	Remove configuration / delete entry / reset to default value
	<b>mab</b>	Configure MAB parameters
	<b>reauthentication</b>	Periodic re-authentication from authenticator to server
<b>Defaults</b>	Disable	
<b>Command Modes</b>	Interface Configuration	
<b>Usage Guidelines</b>	`no` command will reset parameters to default value.	
<b>Examples</b>	moxa(config-if)# mab reauthentication moxa(config-if)# no mab reauthentication	
<b>Error messages</b>	N/A	
<b>Warning messages</b>	N/A	
<b>Related commands</b>	show mab	

## Configure MAB Timeout and Reauthentication Period

### Commands

**mab timeout** { quiet-period [<(5 - 300)>] | reauth-period [<(60 - 65535)>] }

**no mab timeout reauth-period**

<b>Syntax Description</b>	<b>no</b>	Remove configuration / delete entry / reset to default value
	<b>mab</b>	Configure MAB parameters
	<b>timeout</b>	Configure timeout
	<b>quiet-period</b>	Number of seconds that the switch remains in the quiet state following a failed authentication exchange with the client.
	<b>reauth-period</b>	number of seconds between re-authentication attempts
<b>Defaults</b>	quiet-period: 60 reauth-period: 3600	
<b>Command Modes</b>	Interface Configuration	
<b>Usage Guidelines</b>	`no` command will reset parameters to default value.	
<b>Examples</b>	moxa(config-if)# mab timeout quiet-period 300 moxa(config-if)# mab timeout reauth-period 65535	
<b>Error messages</b>	moxa(config-if)# mab timeout quiet-period 1 mab timeout quiet-period 1 ^ % Invalid input detected at '^' marker.  moxa(config-if)# mab timeout reauth-period 10 mab timeout reauth-period 10 ^ % Invalid input detected at '^' marker.	

<b>Warning messages</b>	N/A
<b>Related commands</b>	show mab

## Configure MAB Local Database MAC Address

### Commands

**mab local-database mac-address** <ucast\_mac>

**no mab local-database** {mac-address <ucast\_mac> | all }

<b>Syntax Description</b>	<b>no</b>	Remove configuration / delete entry / reset to default value
	<b>mab</b>	Configure MAB parameters
	<b>local-database</b>	Configure local database authentication
	mac-address	Unicast MAC address
	all	Delete for all entries
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<pre>moxa(config)# mab local-database mac-address 02:03:04:01:01:01 moxa(config)# no mab local-database mac-address 02:03:04:01:01:01 moxa(config)# no mab local-database all</pre>	
<b>Error messages</b>	<pre>moxa(config)# mab local-database mac-address 00:00:00:00:00:01 The MAC address has exceeded the maximum limit.  moxa(config)# mab local-database mac-address 00:00:00:00:00:02 MAC address is already in the local database.  moxa(config)# mac-address-table static unicast 00:00:00:00:00:03 vlan 1 set interface ethernet 1/1 moxa(config)# mab local-database mac-address 00:00:00:00:00:03 Cannot add a MAC address into MAB local database while it's in static unicast table.  [Web Only] MAB only support unicast MAC address.</pre>	
<b>Warning messages</b>	N/A	
<b>Related commands</b>	show mab auth local-database	

## Show MAB Information

### Commands

**show mab**

<b>Syntax Description</b>	<b>show</b>	Display configuration / statistics / general information
	<b>Mab</b>	Display MAB information
<b>Defaults</b>	N/A	

<b>Command</b>	User EXEC																																																																																					
<b>Modes</b>	Privileged EXEC																																																																																					
<b>Usage Guidelines</b>	N/A																																																																																					
<b>Examples</b>	<pre>moxa# show mab MAB Status: Enabled MAB Authentication Method: Local</pre> <table border="1"> <thead> <tr> <th>Port</th> <th>Enable</th> <th>Quiet Period</th> <th>Reauthentication</th> <th>Reauth Period</th> </tr> </thead> <tbody> <tr><td>Eth1/1</td><td>Disabled</td><td>60</td><td>Enabled</td><td>3600</td></tr> <tr><td>Eth1/2</td><td>Disabled</td><td>60</td><td>Disabled</td><td>3600</td></tr> <tr><td>Eth1/3</td><td>Disabled</td><td>60</td><td>Disabled</td><td>3600</td></tr> <tr><td>Eth1/4</td><td>Disabled</td><td>60</td><td>Disabled</td><td>3600</td></tr> <tr><td>Eth2/1</td><td>Disabled</td><td>60</td><td>Disabled</td><td>3600</td></tr> <tr><td>Eth2/2</td><td>Disabled</td><td>60</td><td>Disabled</td><td>3600</td></tr> <tr><td>Eth2/3</td><td>Disabled</td><td>60</td><td>Disabled</td><td>3600</td></tr> <tr><td>Eth2/4</td><td>Disabled</td><td>60</td><td>Disabled</td><td>3600</td></tr> <tr><td>Eth3/1</td><td>Disabled</td><td>60</td><td>Disabled</td><td>3600</td></tr> <tr><td>Eth3/2</td><td>Disabled</td><td>60</td><td>Disabled</td><td>3600</td></tr> <tr><td>Eth3/3</td><td>Disabled</td><td>60</td><td>Disabled</td><td>3600</td></tr> <tr><td>Eth3/4</td><td>Disabled</td><td>60</td><td>Disabled</td><td>3600</td></tr> <tr><td>Eth4/1</td><td>Disabled</td><td>60</td><td>Disabled</td><td>3600</td></tr> <tr><td>Eth4/2</td><td>Disabled</td><td>60</td><td>Disabled</td><td>3600</td></tr> <tr><td>Eth4/3</td><td>Disabled</td><td>60</td><td>Disabled</td><td>3600</td></tr> <tr><td>Eth4/4</td><td>Disabled</td><td>60</td><td>Disabled</td><td>3600</td></tr> </tbody> </table> <pre>moxa#</pre>	Port	Enable	Quiet Period	Reauthentication	Reauth Period	Eth1/1	Disabled	60	Enabled	3600	Eth1/2	Disabled	60	Disabled	3600	Eth1/3	Disabled	60	Disabled	3600	Eth1/4	Disabled	60	Disabled	3600	Eth2/1	Disabled	60	Disabled	3600	Eth2/2	Disabled	60	Disabled	3600	Eth2/3	Disabled	60	Disabled	3600	Eth2/4	Disabled	60	Disabled	3600	Eth3/1	Disabled	60	Disabled	3600	Eth3/2	Disabled	60	Disabled	3600	Eth3/3	Disabled	60	Disabled	3600	Eth3/4	Disabled	60	Disabled	3600	Eth4/1	Disabled	60	Disabled	3600	Eth4/2	Disabled	60	Disabled	3600	Eth4/3	Disabled	60	Disabled	3600	Eth4/4	Disabled	60	Disabled	3600
Port	Enable	Quiet Period	Reauthentication	Reauth Period																																																																																		
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<b>Warning messages</b>	N/A																																																																																					
<b>Related commands</b>	N/A																																																																																					

## Show MAB Authentication Local Database MAC Address

### Commands

**show mab auth local-database**

<b>Syntax Description</b>	<b>show</b>	Display configuration / statistics / general information
	<b>mab</b>	Display MAB configuration
	<b>auth</b>	Auth type information
	<b>local-database</b>	Display local-database information
<b>Defaults</b>	N/A	
<b>Command Modes</b>	User EXEC Privileged EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<pre>moxa# show mab auth local-database MAB Authentication Users Database ----- MAC Address ----- 02:03:04:01:01:01 02:03:04:01:01:02</pre>	

	Total MAC entries : 2 System Max. Addresses : 1024
<b>Error messages</b>	N/A
<b>Warning messages</b>	N/A
<b>Related commands</b>	N/A

## MACsec

### Enable/Disable MACsec

#### Commands

**macsec** { enable | disable }

<b>Syntax Description</b>	macsec enable	Globally enable MACsec
	macsec disable	Globally disable MACsec
<b>Defaults</b>	Disable	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	Product(config)# macsec enable	
<b>Error messages</b>	Invalid: dot1x global Enable should first be enabled.	
<b>Related commands</b>	N/A	

### Enable/Disable MACsec

#### Commands

**macsec**

**no macsec**

<b>Syntax Description</b>	macsec	Configure mka participant to enable.
	no macsec	Configure mka participant to disable.
<b>Defaults</b>	Disable	
<b>Command Modes</b>	Interface configuration mode	
<b>Usage Guidelines</b>	This command configures MKA participants.	
<b>Examples</b>	Product(config-if)# macsec	
<b>Error messages</b>	Invalid: If the port is in port-channel, it can not enable macsec..	
<b>Related commands</b>	N/A	

### Configure Periodic Hello Time on the Switch to Send Periodic MKA PDUS

#### Commands

**macsec periodic hello-time** <integer (1-10)>

**no macsec periodic hello-time** <integer (1-10)>

<b>Syntax Description</b>	<b>macsec periodic hello-time</b>	Configure periodic hello time
	<b>no macsec periodic hello-time</b>	Delete the configured periodic hello time

<b>Defaults</b>	2 sec
<b>Command Modes</b>	Global configuration
<b>Usage Guidelines</b>	This command configures periodic hello time on the switch to send periodic mka pdu..
<b>Examples</b>	Product(config)# macsec periodic hello-time 10
<b>Error messages</b>	N/A
<b>Related commands</b>	N/A

## Delete the Connectivity Association Key Name (CKN)

### Commands

**no mka participant ckn** <string (16)>

<b>Syntax Description</b>	<b>no mka participant ckn</b>	Delete the connectivity association key name (CKN).
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Interface configuration mode	
<b>Usage Guidelines</b>	This command delete the connectivity association key name (CKN).	
<b>Examples</b>	Product(config-if)# no mka participant ckn	
<b>Error messages</b>	N/A	
<b>Related commands</b>	N/A	

## Create the Pre-shared Key by Configuring the Connectivity Association Key Name (CKN) and Connectivity Association Key (CAK).

### Commands

**mka participant ckn** <string (16)> **cak** <string (66)> **key-server** {enable | disable}

<b>Syntax Description</b>	<b>mka participant ckn &lt;string (1-16)&gt; cak &lt;string (1-16)&gt;</b>	Create the pre-shared key by configuring the connectivity association key name (CKN) and connectivity association key (CAK).
	<b>key-server enable</b>	Configure key-server enable.
	<b>key-server disable</b>	Configure key server disable.
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Interface configuration mode	
<b>Usage Guidelines</b>	This command creates the pre-shared key by configuring the connectivity association key name (CKN) and connectivity association key (CAK).	
<b>Examples</b>	Product(config-if)# mka participant ckn moxackn cak moxacak key-server enable	
<b>Error messages</b>	Invalid: ckn and cak content should not be partially empty. Invalid: ckn and cak content should not be empty when macsec per-port enabled. Invalid: Same CKN entry are not allowed.	
<b>Related commands</b>	N/A	



## Configure the Key Server Priority for MA Functionality Protocol on the Port

### Commands

**mka keyserver-priority** <integer (96-127)>

**no mka keyserver-priority**

<b>Syntax Description</b>	mka key server-priority <integer (96-127)>	To configure the key server priority for mka functionality protocol on the port.
	no mka key server-priority	To delete the configured key server priority for mka functionality protocol on the port.
<b>Defaults</b>	112	
<b>Command Modes</b>	Interface configuration mode	
<b>Usage Guidelines</b>	To configure the key server priority for mka functionality protocol on the port.	
<b>Examples</b>	Product(config-if)# mka keyserver-priority 112	
<b>Error messages</b>	N/A	
<b>Related commands</b>	N/A	

## Enable Tx SA Packet Encryption

### Commands

**macsec encrypt**

<b>Syntax Description</b>	<b>macsec encrypt</b>	To encrypt the Tx SA tunnel.
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Interface configuration mode	
<b>Usage Guidelines</b>	To enable Tx SA packet encryption.	
<b>Examples</b>	Product(config-if)# macsec encrypt	
<b>Error messages</b>	Invalid: txsa has not been created.	
<b>Related commands</b>	N/A	

## Show MACsec Information

### Commands

**show macsec** [{interface <iftype> <ifnum> | **mka** {participant | **peer ckn** <string (16)>} interface <iftype> <ifnum>}]

<b>Syntax Description</b>	<b>show macsec</b>	To Display MACsec status and configuration in the system level.
	interface	To view Kay Mka port related information.
	participant	To view Kay Mka participant related information.
	peer	To display Mka peer List information.
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC Mode	
<b>Usage Guidelines</b>	This command displays macsec information.	
<b>Examples</b>	Product# show macsec	
	MACsec	: Enabled
	Periodic Hello-Time	: 10

	<pre> Product# show macsec interface ethernet 1/2  Mka Pae Kay Info for Eth1/2 -----  MACsec Port      = Enabled KeyServerPriority = 99  Product# show macsec mka participant interface eth 4/8  Mka Participant Info Eth4/8 -----  Participant CKN   = moxackn KeyServer         = Disabled  Product# show macsec mka peer ckn moxackn interface ethernet 4/8  Mka Peer List Info Eth4/8 -----  MkaParticipant CKN : moxackn MkaPeerList MI     : 7d566b62d5a39e30 MkaPeerList MN     : 2099 MkaPeerList Type   : LivePeerList MkaPeerList SCI    : 0078784512451c00 MKA Tx SA          : Created </pre>
<b>Error messages</b>	<pre> If CKN is empty: Product# show macsec mka peer ckn moxackn interface ethernet 4/6 Ckn entry is not exist in the table </pre>
<b>Related commands</b>	N/A

## Port Security

### Configure Port Security Mode

#### Commands

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

<b>Syntax Description</b>	<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
<b>Defaults</b>	The default port security mode is set to static-port-lock	
<b>Command Modes</b>	Privileged EXEC Global Configuration	
<b>Usage Guidelines</b>	Changing modes resets all port configurations.	
<b>Examples</b>	moxa(config)# port-security mode mac-sticky moxa(config)# port-security mode static-port-lock	
<b>Error Messages</b>	"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 redundant protocol cannot be enabled on the same port.'	
<b>Related Commands</b>	N/A	

## Enable/Disable Port Security

### Commands

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

<b>Syntax Description</b>	<b>port-security</b>	Configure port security parameters
	enable	Enable port security
	disable	Disable port security
<b>Defaults</b>	Port security is enabled by default	
<b>Command Modes</b>	Privileged EXEC Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# port-security enable moxa(config)# port-security disable	
<b>Error Messages</b>	"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 redundant protocol cannot be enabled on the same port.'	
<b>Related Commands</b>	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> } ]

<b>Syntax Description</b>	<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	
<b>Defaults</b>	no port-security: disable on ports limit: 1 violation: secure action is packet-drop	
<b>Command Modes</b>	Privileged EXEC Interface Configuration	
<b>Usage Guidelines</b>	If the limit value changes on a port, all entries on the port are deleted.	
<b>Examples</b>	<pre>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</pre>	
<b>Error Messages</b>	<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_SUN_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 {} '.format(red_protocol_def[red_protocol]) + 'cannot be enabled on the same port.'</p>	
<b>Related Commands</b>	N/A	

## Remove Port Security Setting

### Commands

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

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC Interface Configuration	
<b>Usage Guidelines</b>	If the limit value changes on a port, all entries on the port are deleted.	
<b>Examples</b>	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	
<b>Error Messages</b>	"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 redundant protocol cannot be enabled on the same port.'	
<b>Related Commands</b>	set port-security mode [static-port-lock   mac-sticky]	

## Show Port Security Setting

### Commands

**show port-security** [ address ]

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

<b>Syntax Description</b>	<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	
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<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>	
<b>Error Messages</b>	<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>	
<b>Related Commands</b>	<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

<b>Syntax Description</b>	<b>show</b>	Display configuration/status information
	<b>interface</b>	Display interface information
	ifXtype	The interface type
	ifnum	The interface number
	storm-control	Display the broadcast, multicast, and unicast storm control suppression levels of the interface
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<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>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	<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>	



## Access Control List

### Define IPv4 Access-list and Enter IPv4 Access-list Configuration Mode

#### Commands

**ip access-list** <short(1-16)>

<b>Syntax Description</b>	<b>ip</b>	Configure IP related parameters
	<b>access-list</b>	Configure ACL related parameters
	1-16	Access control list index
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global Configuration Mode	
<b>Usage Guidelines</b>	An access list is created when the access list's name or rule is configured	
<b>Examples</b>	moxa# configure terminal moxa(config)# ip access-list 1 moxa(config-ip-acl)#	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	no ip access-list <short(1-16)> show ip access-list <short(1-16)>	

### Configure IPv4 Access-list Name

#### Commands

**name** <string(32)>

<b>Syntax Description</b>	<b>name</b>	Configure IPv4 access-list name
	<string(32)>	IPv4 access-list name
<b>Defaults</b>	N/A	
<b>Command Modes</b>	IP Access-list Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config-ip-acl)# name IP-ACL1	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	show ip access-list <short(1-16)>	

## Configure Permitted IPv4 ACL Rules

### Commands

#### Permit

{**any** | **src** <ip-address> | <ip-address> <ip-mask>}

[{ **any** | **dst** <ip-address> | <ip-address> <ip-mask> }]

[**dscp** <short(0-63)>]

[**redirect interface** <interface-type> <interface-id>]

[**dscp-remark** <short(0-63)>]

<b>Syntax Description</b>	<b>permit</b>	Configure the permitted ACL rule
	<b>any</b>	Configure the filtering of a rule to any address
	<b>src</b>	Configure the source related ACL parameters
	(ip-addr/mask)	Configure the filtering of a rule to a specific address/mask
	<b>any</b>	Configure the filtering of a rule to any address
	<b>dst</b>	Configure the destination related ACL parameters
	(ip-addr/mask)	Configure the filtering of a rule to a specific address/mask
	<b>dscp</b>	Configure the DSCP related ACL parameters
	(0-63)	DSCP value to filter
	<b>redirect</b>	Configure the redirect related ACL parameters
	<b>interface</b>	Configure the interface related ACL parameters
(interface-type /interface-id)	Interface to redirect packets that hits ACL rules	
<b>dscp-remark</b>	Configure the dscp-remark related ACL parameters	
(0-63)	DSCP value to remark	
<b>Defaults</b>	N/A	
<b>Command Modes</b>	IP Access-list Configuration Mode	
<b>Usage Guidelines</b>	Only support redirect in inbound traffic Only support DSCP remarking in outbound traffic	
<b>Examples</b>	<pre>moxa(config-ip-acl)# permit src 192.168.127.253 dst 192.168.127.100 moxa(config-ip-acl)# deny 192.168.127.0 255.255.255.0 192.168.127.0 255.255.255.0  moxa(config-ip-acl)# permit any any dscp 32  moxa(config-ip-acl)# permit any any redirect interface ethernet 1/1  moxa(config-ip-acl)# permit any any dscp-remark 10</pre>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	<pre>no rule &lt;short(1-10)&gt; no ip access-list &lt;short(1-16)&gt; show ip access-list &lt;short(1-16)&gt;</pre>	

## Configure Permitted TCP ACL Rules

### Commands

#### permit tcp

```
{any | src <ip-address> | <ip-address> <ip-mask>}
[ { any | dst <ip-address> | <ip-address> <ip-mask> } ]
[src-port <short(0-65535)>]
[dst-port <short(0-65535)>] [dscp <short(0-63)>]
[redirect interface <interface-type> <interface-id> ]
[dscp-remark <short(0-63)>]
```

<b>Syntax Description</b>	<b>permit</b>	Configure the permitted ACL rule
	<b>tcp</b>	Configure the tcp related ACL parameters
	<b>any</b>	Configure the filtering of a rule to any address
	<b>src</b>	Configure the source related ACL parameters
	(ip-addr/mask)	Configure the filtering of a rule to a specific address/mask
	<b>any</b>	Configure the filtering of a rule to any address
	<b>dst</b>	Configure the destination related ACL parameters
	(ip-addr/mask)	Configure the filtering of a rule to a specific address/mask
	<b>src-port</b>	Configure the source-port related ACL parameters
	(0-65535)	Source port value to filter
	<b>dst-port</b>	Configure the destination-port related ACL parameters
	(0-65535)	Destination port value to filter
	<b>any</b>	Configure the filtering of a rule to any address
	<b>dscp</b>	Configure the dscp related ACL parameters
	(0-63)	DSCP value to filter
	<b>redirect</b>	Configure the redirect related ACL parameters
	<b>interface</b>	Configure the interface related ACL parameters
(interface-type /interface-id)	Interface to redirect packets that hits ACL rules	
<b>dscp-remark</b>	Configure the dscp-remark related ACL parameters	
(0-63)	DSCP value to remark	
<b>Defaults</b>	N/A	
<b>Command Modes</b>	IP Access-list Configuration Mode	
<b>Usage Guidelines</b>	Only support redirect in inbound traffic Only support DSCP remarking in outbound traffic	
<b>Examples</b>	<pre>moxa(config-ip-acl)# permit tcp 192.168.127.253 255.255.255.0 192.168.127.100 255.255.255.0 src-port 23 dst-port 22  moxa(config-ip-acl)# permit tcp any any dscp 32  moxa(config-ip-acl)# permit tcp any any redirect interface ethernet 1/1  moxa(config-ip-acl)# permit tcp any any dscp-remark 10</pre>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	<pre>no rule &lt;short(1-10)&gt; no ip access-list &lt;short(1-16)&gt; show ip access-list &lt;short(1-16)&gt;</pre>	

## Configure Permitted UDP ACL Rules

### Commands

#### permit udp

{**any** | **src** <ip-address> | <ip-address> <ip-mask>}

[{ **any** | **dst** <ip-address> | <ip-address> <ip-mask> }]

[**src-port** <short(0-65535)>]

[**dst-port** <short(0-65535)>]

[**dscp** <short(0-63)>]

[**redirect interface** <interface-type> <interface-id> ]

[**dscp-remark** <short(0-63)>]

<b>Syntax Description</b>	<b>permit</b>	Configure the permitted ACL rule
	<b>udp</b>	Configure the udp related ACL parameters
	<b>any</b>	Configure the filtering of a rule to any address
	<b>src</b>	Configure the source related ACL parameters
	(ip-addr/mask)	Configure the filtering of a rule to a specific address/mask
	<b>any</b>	Configure the filtering of a rule to any address
	<b>dst</b>	Configure the destination related ACL parameters
	(ip-addr/mask)	Configure the filtering of a rule to a specific address/mask
	<b>src-port</b>	Configure the source-port related ACL parameters
	(0-65535)	Source port value to filter
	<b>dst-port</b>	Configure the destination-port related ACL parameters
	(0-65535)	Destination port value to filter
	<b>any</b>	Configure the filtering of a rule to any address
	<b>dscp</b>	Configure the dscp related ACL parameters
	(0-63)	DSCP value to filter
	<b>redirect</b>	Configure the redirect related ACL parameters
<b>interface</b>	Configure the interface related ACL parameters	
(interface-type /interface-id)	Interface to redirect packets that hits ACL rules	
<b>dscp-remark</b>	Configure the dscp-remark related ACL parameters	
(0-63)	DSCP value to remark	
<b>Defaults</b>	N/A	
<b>Command Modes</b>	IP Access-list Configuration Mode	
<b>Usage Guidelines</b>	Only support redirect in inbound traffic Only support DSCP remarking in outbound traffic	
<b>Examples</b>	<pre>moxa(config-ip-acl)# permit udp 192.168.127.253 255.255.255.0 192.168.127.100 255.255.255.0 src-port 23 dst-port 22  moxa(config-ip-acl)# permit udp any any dscp 32  moxa(config-ip-acl)# permit udp any any redirect interface ethernet 1/1  moxa(config-ip-acl)# permit udp any any dscp-remark 10</pre>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	<pre>no rule &lt;short(1-10)&gt; no ip access-list &lt;short(1-16)&gt; show ip access-list &lt;short(1-16)&gt;</pre>	

## Configure Permitted ICMP ACL Rules

### Commands

#### permit icmp

{**any** | **src** <ip-address> | <ip-address> <ip-mask>}

[{ **any** | **dst** <ip-address> | <ip-address> <ip-mask> }]

[**type** <short(0-255)>]

[**code** <short(0-15)>]

[**dscp** <short(0-63)>]

[**redirect interface** <interface-type> <interface-id> ]

[**dscp-remark** <short(0-63)>]

<b>Syntax Description</b>	<b>permit</b>	Configure the permitted ACL rule
	<b>icmp</b>	Configure the ICMP related ACL parameters
	<b>any</b>	Configure the filtering of a rule to any address
	<b>src</b>	Configure the source related ACL parameters
	(ip-addr/mask)	Configure the filtering of a rule to a specific address/mask
	<b>any</b>	Configure the filtering of a rule to any address
	<b>dst</b>	Configure the destination related ACL parameters
	(ip-addr/mask)	Configure the filtering of a rule to a specific address/mask
	<b>src-port</b>	Configure the source-port related ACL parameters
	(0-65535)	Source port value to filter
	<b>type</b>	Configure the ICMP type related ACL parameters
	(0-255)	ICMP type value to filter
	<b>code</b>	Configure the ICMP code related ACL parameters
	(0-15)	ICMP code value to filter
	<b>any</b>	Configure the filtering of a rule to any address
	<b>dscp</b>	Configure the dscp related ACL parameters
	(0-63)	DSCP value to filter
	<b>redirect</b>	Configure the redirect related ACL parameters
	<b>interface</b>	Configure the interface related ACL parameters
	(interface-type /interface-id)	Interface to redirect packets that hits ACL rules
<b>dscp-remark</b>	Configure the dscp-remark related ACL parameters	
(0-63)	DSCP value to remark	
<b>Defaults</b>	N/A	
<b>Command Modes</b>	IP Access-list Configuration Mode	
<b>Usage Guidelines</b>	Only support redirect in inbound traffic Only support DSCP remarking in outbound traffic	
<b>Examples</b>	<pre>moxa(config-ip-acl)# permit icmp 192.168.127.253 255.255.255.0 192.168.127.100 255.255.255.0 type 3 code 10  moxa(config-ip-acl)# permit icmp any any dscp 32  moxa(config-ip-acl)# permit icmp any any redirect interface ethernet 1/1  moxa(config-ip-acl)# permit icmp any any dscp-remark 10</pre>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	<pre>no rule &lt;short(1-10)&gt; no ip access-list &lt;short(1-16)&gt; show ip access-list &lt;short(1-16)&gt;</pre>	

## Configure Permitted IGMP ACL Rules

### Commands

#### permit igmp

```
{any | src <ip-address> | <ip-address> <ip-mask>}
[ { any | dst <ip-address> | <ip-address> <ip-mask> } ]
[type <short(0-255)>]
[dscp <short(0-63)>]
[redirect interface <interface-type> <interface-id> ]
[dscp-remark <short(0-63)>]
```

<b>Syntax Description</b>	<b>permit</b>	Configure the permitted ACL rule
	<b>igmp</b>	Configure the IGMP related ACL parameters
	<b>any</b>	Configure the filtering of a rule to any address
	<b>src</b>	Configure the source related ACL parameters
	(ip-addr/mask)	Configure the filtering of a rule to a specific address/mask
	<b>any</b>	Configure the filtering of a rule to any address
	<b>dst</b>	Configure the destination related ACL parameters
	(ip-addr/mask)	Configure the filtering of a rule to a specific address/mask
	<b>src-port</b>	Configure the source-port related ACL parameters
	(0-65535)	Source port value to filter
	<b>type</b>	Configure the IGMP type related ACL parameters
	(0-15)	IGMP type value to filter
	<b>any</b>	Configure the filtering of a rule to any address
	<b>dscp</b>	Configure the dscp related ACL parameters
	(0-63)	DSCP value to filter
	<b>redirect</b>	Configure the redirect related ACL parameters
<b>interface</b>	Configure the interface related ACL parameters	
(interface-type /interface-id)	Interface to redirect packets that hits ACL rules	
<b>dscp-remark</b>	Configure the dscp-remark related ACL parameters	
(0-63)	DSCP value to remark	
<b>Defaults</b>	N/A	
<b>Command Modes</b>	IP Access-list Configuration Mode	
<b>Usage Guidelines</b>	Only support redirect in inbound traffic Only support DSCP remarking in outbound traffic	
<b>Examples</b>	<pre>moxa(config-ip-acl)# permit icmp 192.168.127.253 255.255.255.0 192.168.127.100 255.255.255.0 type 5  moxa(config-ip-acl)# permit igmp any any dscp 32  moxa(config-ip-acl)# permit igmp any any redirect interface ethernet 1/1  moxa(config-ip-acl)# permit igmp any any dscp-remark 10</pre>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	<pre>no rule &lt;short(1-10)&gt; no ip access-list &lt;short(1-16)&gt; show ip access-list &lt;short(1-16)&gt;</pre>	

## Configure Permitted OSPF ACL Rules

### Commands

#### permit ospf

{**any** | **src** <ip-address> | <ip-address> <ip-mask>}

[{ **any** | **dst** <ip-address> | <ip-address> <ip-mask> }]

[**dscp** <short(0-63)>]

[**redirect interface** <interface-type> <interface-id> ]

[**dscp-remark** <short(0-63)>]

<b>Syntax Description</b>	<b>permit</b>	Configure the permitted ACL rule
	<b>ospf</b>	Configure the OSPF related ACL parameters
	<b>any</b>	Configure the filtering of a rule to any address
	<b>src</b>	Configure the source related ACL parameters
	(ip-addr/mask)	Configure the filtering of a rule to a specific address/mask
	<b>any</b>	Configure the filtering of a rule to any address
	<b>dst</b>	Configure the destination related ACL parameters
	(ip-addr/mask)	Configure the filtering of a rule to a specific address/mask
	<b>dscp</b>	Configure the dscp related ACL parameters
	(0-63)	DSCP value to filter
	<b>redirect</b>	Configure the redirect related ACL parameters
	<b>interface</b>	Configure the interface related ACL parameters
(interface-type /interface-id)	Interface to redirect packets that hits ACL rules	
<b>dscp-remark</b>	Configure the dscp-remark related ACL parameters	
(0-63)	DSCP value to remark	
<b>Defaults</b>	N/A	
<b>Command Modes</b>	IP Access-list Configuration Mode	
<b>Usage Guidelines</b>	Only support redirect in inbound traffic Only support DSCP remarking in outbound traffic	
<b>Examples</b>	<pre>moxa(config-ip-acl)# permit ospf 192.168.127.253 255.255.255.0 192.168.127.100 255.255.255.0</pre> <pre>moxa(config-ip-acl)# permit ospf any any dscp 32</pre> <pre>moxa(config-ip-acl)# permit ospf any any redirect interface ethernet 1/1</pre> <pre>moxa(config-ip-acl)# permit ospf any any dscp-remark 10</pre>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	<pre>no rule &lt;short(1-10)&gt;</pre> <pre>no ip access-list &lt;short(1-16)&gt;</pre> <pre>show ip access-list &lt;short(1-16)&gt;</pre>	

## Configure Permitted Protocol ACL Rules

### Commands

```

permit protocol <short(0-255)>
{any | src <ip-address> | <ip-address> <ip-mask>}
[{ any | dst <ip-address> | <ip-address> <ip-mask> }]
[dscp <short(0-63)>]
[redirect interface <interface-type> <interface-id> ]
[dscp-remark <short(0-63)>]
  
```

<b>Syntax Description</b>	<b>permit</b>	Configure the permitted ACL rule
	<b>protocol</b>	Configure the protocol related ACL parameters
	(0-255)	Protocol value to filter
	<b>any</b>	Configure the filtering of a rule to any address
	<b>src</b>	Configure the source related ACL parameters
	(ip-addr/mask)	Configure the filtering of a rule to a specific address/mask
	<b>any</b>	Configure the filtering of a rule to any address
	<b>dst</b>	Configure the destination related ACL parameters
	(ip-addr/mask)	Configure the filtering of a rule to a specific address/mask
	<b>dscp</b>	Configure the dscp related ACL parameters
	(0-63)	DSCP value to filter
	<b>redirect</b>	Configure the redirect related ACL parameters
<b>interface</b>	Configure the interface related ACL parameters	
(interface-type /interface-id)	Interface to redirect packets that hits ACL rules	
<b>dscp-remark</b>	Configure the dscp-remark related ACL parameters	
(0-63)	DSCP value to remark	
<b>Defaults</b>	N/A	
<b>Command Modes</b>	IP Access-list Configuration Mode	
<b>Usage Guidelines</b>	Only support redirect in inbound traffic Only support DSCP remarking in outbound traffic	
<b>Examples</b>	<pre> moxa(config-ip-acl)# permit protocol 136 192.168.127.253 255.255.255.0 192.168.127.100 255.255.255.0  moxa(config-ip-acl)# permit protocol 136 any any dscp 32  moxa(config-ip-acl)# permit protocol 136 any any redirect interface ethernet 1/1  moxa(config-ip-acl)# permit protocol 136 any any dscp-remark 10           </pre>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	<pre> no rule &lt;short(1-10)&gt; no ip access-list &lt;short(1-16)&gt; show ip access-list &lt;short(1-16)&gt;           </pre>	



## Configure Unacceptable ACL Rules

### Commands

#### deny

{**any** | src <ip-address> | <ip-address> <ip-mask>}

[{ **any** | dst <ip-address> | <ip-address> <ip-mask> }]

[**dscp** <short(0-63)>]

<b>Syntax Description</b>	<b>deny</b>	Configure the unacceptable ACL rule
	<b>any</b>	Configure the filtering of a rule to any address
	<b>src</b>	Configure the source related ACL parameters
	(ip-addr/mask)	Configure the filtering of a rule to a specific address/mask
	<b>any</b>	Configure the filtering of a rule to any address
	<b>dst</b>	Configure the destination related ACL parameters
	(ip-addr/mask)	Configure the filtering of a rule to a specific address/mask
<b>dscp</b>		Configure the dscp related ACL parameters
	(0-63)	DSCP value to filter
<b>Defaults</b>	N/A	
<b>Command Modes</b>	IP Access-list Configuration Mode	
<b>Usage Guidelines</b>		
<b>Examples</b>	<pre>moxa(config-ip-acl)# deny 192.168.127.253 255.255.255.0 192.168.127.100 255.255.255.0  moxa(config-ip-acl)# deny any any dscp 32</pre>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	<pre>no rule &lt;short(1-10)&gt; no ip access-list &lt;short(1-16)&gt; show ip access-list &lt;short(1-16)&gt;</pre>	

## Configure Unacceptable TCP ACL Rules

### Commands

#### deny tcp

{**any** | src <ip-address> | <ip-address> <ip-mask>}

[{ **any** | dst <ip-address> | <ip-address> <ip-mask> }]

[**src-port** <short(0-65535)>]

[**dst-port** <short(0-65535)>]

[**dscp** <short(0-63)>]

<b>Syntax Description</b>	<b>deny</b>	Configure the unacceptable ACL rule
	<b>tcp</b>	Configure the tcp related ACL parameters
	<b>any</b>	Configure the filtering of a rule to any address
	<b>src</b>	Configure the source related ACL parameters
	(ip-addr/mask)	Configure the filtering of a rule to a specific address/mask
	<b>any</b>	Configure the filtering of a rule to any address
	<b>dst</b>	Configure the destination related ACL parameters
	(ip-addr/mask)	Configure the filtering of a rule to a specific address/mask
	<b>dst-port</b>	Configure the destination-port related ACL parameters
	(0-65535)	Destination port value to filter
<b>Defaults</b>	<b>any</b>	Configure the filtering of a rule to any address
	<b>dscp</b>	Configure the dscp related ACL parameters
	(0-63)	DSCP value to filter
<b>Defaults</b>	N/A	
<b>Command Modes</b>	IP Access-list Configuration Mode	
<b>Usage Guidelines</b>		
<b>Examples</b>	moxa(config-ip-acl)# deny tcp 192.168.127.253 255.255.255.0 192.168.127.100 255.255.255.0	
	moxa(config-ip-acl)# deny tcp any any dscp 32	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	no rule <short(1-10)>	
	no ip access-list <short(1-16)>	
	show ip access-list <short(1-16)>	

## Configure Unacceptable UDP ACL Rules

### Commands

#### deny udp

{**any** | src <ip-address> | <ip-address> <ip-mask>}

[{ **any** | dst <ip-address> | <ip-address> <ip-mask> }]

[**src-port** <short(0-65535)>]

[**dst-port** <short(0-65535)>]

<b>Syntax Description</b>	<b>deny</b>	Configure the unacceptable ACL rule
	<b>udp</b>	Configure the udp related ACL parameters
	<b>any</b>	Configure the filtering of a rule to any address
	<b>src</b>	Configure the source related ACL parameters
	(ip-addr/mask)	Configure the filtering of a rule to a specific address/mask
	<b>any</b>	Configure the filtering of a rule to any address
	<b>dst</b>	Configure the destination related ACL parameters
	(ip-addr/mask)	Configure the filtering of a rule to a specific address/mask
	<b>dst-port</b>	Configure the destination-port related ACL parameters
	(0-65535)	Destination port value to filter
	<b>any</b>	Configure the filtering of a rule to any address
	<b>dscp</b>	Configure the dscp related ACL parameters
(0-63)	DSCP value to filter	
<b>Defaults</b>	N/A	
<b>Command Modes</b>	IP Access-list Configuration Mode	
<b>Usage Guidelines</b>		
<b>Examples</b>	<pre>moxa(config-ip-acl)# deny udp 192.168.127.253 255.255.255.0 192.168.127.100 255.255.255.0</pre> <pre>moxa(config-ip-acl)# deny udp any any dscp 32</pre>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	<pre>no rule &lt;short(1-10)&gt;</pre> <pre>no ip access-list &lt;short(1-16)&gt;</pre> <pre>show ip access-list &lt;short(1-16)&gt;</pre>	

## Configure Unacceptable ICMP ACL Rules

### Commands

#### deny icmp

{**any** | src <ip-address> | <ip-address> <ip-mask>}

[{ **any** | dst <ip-address> | <ip-address> <ip-mask> }]

[**type** <short(0-255)>]

[**code** <short(0-15)>]

[**dscp** <short(0-63)>]

<b>Syntax Description</b>	<b>deny</b>	Configure the unacceptable ACL rule
	<b>icmp</b>	Configure the icmp related ACL parameters
	<b>any</b>	Configure the filtering of a rule to any address
	<b>src</b>	Configure the source related ACL parameters
	(ip-addr/mask)	Configure the filtering of a rule to a specific address/mask
	<b>any</b>	Configure the filtering of a rule to any address
	<b>dst</b>	Configure the destination related ACL parameters
	(ip-addr/mask)	Configure the filtering of a rule to a specific address/mask
	<b>type</b>	Configure the ICMP type related ACL parameters
	(0-255)	ICMP type value to filter
	<b>code</b>	Configure the ICMP code related ACL parameters
	(0-15)	ICMP code value to filter
	<b>any</b>	Configure the filtering of a rule to any address
<b>dscp</b>	Configure the dscp related ACL parameters	
(0-63)	DSCP value to filter	
<b>Defaults</b>	N/A	
<b>Command Modes</b>	IP Access-list Configuration Mode	
<b>Usage Guidelines</b>		
<b>Examples</b>	moxa(config-ip-acl)# deny icmp 192.168.127.253 255.255.255.0 192.168.127.100 255.255.255.0 type 3 code 10  moxa(config-ip-acl)# deny icmp any any dscp 32	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	no rule <short(1-10)> no ip access-list <short(1-16)> show ip access-list <short(1-16)>	

## Configure Unacceptable IGMP ACL Rules

### Commands

#### deny igmp

{**any** | src <ip-address> | <ip-address> <ip-mask>}

[{ **any** | dst <ip-address> | <ip-address> <ip-mask> }]

[**type** <short(0-255)>]

[**dscp** <short(0-63)>]

<b>Syntax Description</b>	<b>deny</b>	Configure the unacceptable ACL rule
	<b>igmp</b>	Configure the igmp related ACL parameters
	<b>any</b>	Configure the filtering of a rule to any address
	<b>src</b>	Configure the source related ACL parameters
	(ip-addr/mask)	Configure the filtering of a rule to a specific address/mask
	<b>any</b>	Configure the filtering of a rule to any address
	<b>dst</b>	Configure the destination related ACL parameters
	(ip-addr/mask)	Configure the filtering of a rule to a specific address/mask
	<b>type</b>	Configure the ICMP type related ACL parameters
	(0-255)	ICMP type value to filter
	<b>any</b>	Configure the filtering of a rule to any address
	<b>dscp</b>	Configure the dscp related ACL parameters
(0-63)	DSCP value to filter	
<b>Defaults</b>	N/A	
<b>Command Modes</b>	IP Access-list Configuration Mode	
<b>Usage Guidelines</b>		
<b>Examples</b>	moxa(config-ip-acl)# deny igmp 192.168.127.253 255.255.255.0 192.168.127.100 255.255.255.0 type 5  moxa(config-ip-acl)# deny igmp any any dscp 32	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	no rule <short(1-10)> no ip access-list <short(1-16)> show ip access-list <short(1-16)>	

## Configure Unacceptable OSPF ACL Rules

### Commands

#### deny ospf

{**any** | src <ip-address> | <ip-address> <ip-mask>}

[{ **any** | dst <ip-address> | <ip-address> <ip-mask> }]

[**dscp** <short(0-63)>]

<b>Syntax Description</b>	<b>deny</b>	Configure the unacceptable ACL rule
	<b>ospf</b>	Configure the ospf related ACL parameters
	<b>any</b>	Configure the filtering of a rule to any address
	<b>src</b>	Configure the source related ACL parameters
	(ip-addr/mask)	Configure the filtering of a rule to a specific address/mask
	<b>any</b>	Configure the filtering of a rule to any address
	<b>dst</b>	Configure the destination related ACL parameters
	(ip-addr/mask)	Configure the filtering of a rule to a specific address/mask
	<b>any</b>	Configure the filtering of a rule to any address
	<b>dscp</b>	Configure the dscp related ACL parameters
(0-63)	DSCP value to filter	
<b>Defaults</b>	N/A	
<b>Command Modes</b>	IP Access-list Configuration Mode	
<b>Usage Guidelines</b>		
<b>Examples</b>	moxa(config-ip-acl)# deny ospf 192.168.127.253 255.255.255.0 192.168.127.100 255.255.255.0  moxa(config-ip-acl)# deny ospf any any dscp 32	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	no rule <short(1-10)> no ip access-list <short(1-16)> show ip access-list <short(1-16)>	

## Configure Unacceptable Protocol ACL Rules

### Commands

**deny protocol** <short(0-255)>

{**any** | src <ip-address> | <ip-address> <ip-mask>}

[{ **any** | dst <ip-address> | <ip-address> <ip-mask> }]

[**dscp** <short(0-63)>]

<b>Syntax Description</b>	<b>deny</b>	Configure the unacceptable ACL rule
	<b>protocol</b>	Configure the protocol related ACL parameters
	(0-255)	Protocol value to filter
	<b>any</b>	Configure the filtering of a rule to any address
	<b>src</b>	Configure the source related ACL parameters
	(ip-addr/mask)	Configure the filtering of a rule to a specific address/mask
	<b>any</b>	Configure the filtering of a rule to any address
	<b>dst</b>	Configure the destination related ACL parameters
	(ip-addr/mask)	Configure the filtering of a rule to a specific address/mask
	<b>any</b>	Configure the filtering of a rule to any address
<b>Defaults</b>	<b>dscp</b>	Configure the dscp related ACL parameters
	(0-63)	DSCP value to filter
<b>Command Modes</b>	N/A	
<b>Usage Guidelines</b>	IP Access-list Configuration Mode	
<b>Examples</b>	<pre>moxa(config-ip-acl)# deny protocol 136 192.168.127.253 255.255.255.0 192.168.127.100 255.255.255.0  moxa(config-ip-acl)# deny protocol 136 any any dscp 32</pre>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	<pre>no rule &lt;short(1-10)&gt; no ip access-list &lt;short(1-16)&gt; show ip access-list &lt;short(1-16)&gt;</pre>	

## Enable/Disable an IP ACL rule

### Commands

**rule** <short(1-10)> {**enable** | **disable**}

<b>Syntax Description</b>	<b>rule</b>	Configure the rule related ACL parameters
	(1-10)	Rule index
	<b>enable</b>	Enable the rule
	<b>disable</b>	Disable the rule
<b>Defaults</b>	N/A	
<b>Command Modes</b>	IP Access-list Configuration Mode	
<b>Usage Guidelines</b>		
<b>Examples</b>	<pre>moxa(config-ip-acl)# rule 9 enable moxa(config-ip-acl)# rule 9 disable</pre>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	<pre>show ip access-list &lt;short(1-16)&gt;</pre>	

## Remove an IPv4 Access-list

### Commands

no ip access-list <short(1-16)>

<b>Syntax Description</b>	<b>no</b>	Remove configuration / delete entry / reset to default value
	<b>ip</b>	Configure IP related parameters
	<b>access-list</b>	Configure ACL related parameters
	(1-16)	Access control list index
<b>Defaults</b>	N/A	
<b>Command Modes</b>	IP Access-list Configuration Mode	
<b>Usage Guidelines</b>		
<b>Examples</b>	moxa(config-ip-acl)# no ip access-list 10	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	show ip access-list <short(1-16)>	

## Configure a MAC Access-list and Enter MAC Access-list Configuration Mode

### Commands

mac access-list <short(1-16)>

<b>Syntax Description</b>	<b>mac</b>	Configure MAC related parameters
	<b>access-list</b>	Configure ACL related parameters
	(1-16)	Access control list index
<b>Defaults</b>	N/A	
<b>Command Modes</b>	IP Access-list Configuration Mode	
<b>Usage Guidelines</b>		
<b>Examples</b>	moxa# configure terminal moxa(config)# mac access-list 1 moxa(config-mac-acl)#	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	No mac access-list <short(1-16)> show ip access-list <short(1-16)>	



## Configure Permitted MAC ACL Rules

### Commands

#### permit

```
{any | src < mac -address> | < mac -address> < mac -mask>}
[any | dst < mac -address> | < mac -address> < mac -mask> ]
[vlan <short(1-4094)>]
[cos <short(0-7)>]
[redirect interface <interface-type> <interface-id> ]
[cos-remark <short(0-7)>]
```

<b>Syntax Description</b>	<b>permit</b>	Configure the permitted ACL rule
	<b>any</b>	Configure the filtering of a rule to any address
	src	Configure the source related ACL parameters
	(mac-addr/mask)	Configure the filtering of a rule to a specific address/mask
	<b>any</b>	Configure the filtering of a rule to any address
	<b>dst</b>	Configure the destination related ACL parameters
	(mac-addr/mask)	Configure the filtering of a rule to a specific address/mask
	<b>vlan</b>	Configure the vlan related ACL parameters
	(1-4094)	VLAN index value to filter
	<b>cos</b>	Configure the cos related ACL parameters
	(0-7)	Cos value to filter
	<b>redirect</b>	Configure the redirect related ACL parameters
	<b>interface</b>	Configure the interface related ACL parameters
	(interface-type /interface-id)	Interface to redirect packets that hits ACL rules
	<b>cos-remark</b>	Configure the cos-remark related ACL parameters
(0-7)	Cos value to remark	
<b>Defaults</b>	N/A	
<b>Command Modes</b>	IP Access-list Configuration Mode	
<b>Usage Guidelines</b>	Only support redirect in inbound traffic Only support DSCP remarking in outbound traffic	
<b>Examples</b>	<pre>moxa(config-mac-acl)# permit 00:90:e8:00:00:12 ff:ff:ff:ff:00 00:90:e8:00:00:33 ff:ff:ff:ff:00  moxa(config-mac-acl)# permit any any vlan 2 cos 1  moxa(config-mac-acl)# permit any any redirect interface ethernet 1/1  moxa(config-mac-acl)# permit any any cos-remark 7</pre>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	<pre>no rule &lt;short(1-10)&gt; no ip access-list &lt;short(1-16)&gt; show ip access-list &lt;short(1-16)&gt;</pre>	

## Configure Permitted Goose ACL Rules

### Commands

#### permit goose

{**any** | src < mac -address> | < mac -address> < mac -mask>}

[{ **any** | dst < mac -address> | < mac -address> < mac -mask> }]

[**vlan** <short(1-4094)>]

[**cos** <short(0-7)>]

[**redirect interface** <interface-type> <interface-id> ]

[**cos-remark** <short(0-7)>]

<b>Syntax Description</b>	<b>permit</b>	Configure the permitted ACL rule
	<b>goose</b>	Configure the goose related parameters
	<b>any</b>	Configure the filtering of a rule to any address
	<b>src</b>	Configure the source related ACL parameters
	(mac-addr/mask)	Configure the filtering of a rule to a specific address/mask
	<b>any</b>	Configure the filtering of a rule to any address
	<b>dst</b>	Configure the destination related ACL parameters
	(mac-addr/mask)	Configure the filtering of a rule to a specific address/mask
	<b>vlan</b>	Configure the vlan related ACL parameters
	(1-4094)	VLAN index value to filter
	<b>cos</b>	Configure the cos related ACL parameters
	(0-7)	Cos value to filter
	<b>redirect</b>	Configure the redirect related ACL parameters
	<b>interface</b>	Configure the interface related ACL parameters
(interface-type /interface-id)	Interface to redirect packets that hits ACL rules	
<b>cos-remark</b>	Configure the cos-remark related ACL parameters	
(0-7)	Cos value to remark	
<b>Defaults</b>	N/A	
<b>Command Modes</b>	IP Access-list Configuration Mode	
<b>Usage Guidelines</b>	Only support redirect in inbound traffic Only support DSCP remarking in outbound traffic	
<b>Examples</b>	<pre>moxa(config-mac-acl)# permit goose 00:90:e8:00:00:12 ff:ff:ff:ff:ff:00 00:90:e8:00:00:33 ff:ff:ff:ff:ff:00  moxa(config-mac-acl)# permit goose any any vlan 2 cos 1  moxa(config-mac-acl)# permit goose any any redirect interface ethernet 1/1  moxa(config-mac-acl)# permit goose any any cos-remark 7</pre>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	<pre>no rule &lt;short(1-10)&gt; no ip access-list &lt;short(1-16)&gt; show ip access-list &lt;short(1-16)&gt;</pre>	

## Configure Permitted SMV ACL Rules

### Commands

#### permit smv

```
{any | src < mac -address> | < mac -address> < mac -mask>}
[ { any | dst < mac -address> | < mac -address> < mac -mask> } ]
[vlan <short(1-4094)>]
[cos <short(0-7)>]
[redirect interface <interface-type> <interface-id> ]
[cos-remark <short(0-7)>]
```

<b>Syntax Description</b>	<b>permit</b>	Configure the permitted ACL rule
	<b>smv</b>	Configure the smv related parameters
	<b>any</b>	Configure the filtering of a rule to any address
	<b>src</b>	Configure the source related ACL parameters
	(mac-addr/mask)	Configure the filtering of a rule to a specific address/mask
	<b>any</b>	Configure the filtering of a rule to any address
	<b>dst</b>	Configure the destination related ACL parameters
	(mac-addr/mask)	Configure the filtering of a rule to a specific address/mask
	<b>vlan</b>	Configure the vlan related ACL parameters
	(1-4094)	VLAN index value to filter
	<b>cos</b>	Configure the cos related ACL parameters
	(0-7)	Cos value to filter
	<b>redirect</b>	Configure the redirect related ACL parameters
	<b>interface</b>	Configure the interface related ACL parameters
(interface-type /interface-id)	Interface to redirect packets that hits ACL rules	
<b>cos-remark</b>	Configure the cos-remark related ACL parameters	
(0-7)	Cos value to remark	
<b>Defaults</b>	N/A	
<b>Command Modes</b>	IP Access-list Configuration Mode	
<b>Usage Guidelines</b>	Only support redirect in inbound traffic Only support DSCP remarking in outbound traffic	
<b>Examples</b>	<pre>moxa(config-mac-acl)# permit smv 00:90:e8:00:00:12 ff:ff:ff:ff:00 00:90:e8:00:00:33 ff:ff:ff:ff:00  moxa(config-mac-acl)# permit smv any any vlan 2 cos 1  moxa(config-mac-acl)# permit smv any any redirect interface ethernet 1/1  moxa(config-mac-acl)# permit smv any any cos-remark 7</pre>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	<pre>no rule &lt;short(1-10)&gt; no ip access-list &lt;short(1-16)&gt; show ip access-list &lt;short(1-16)&gt;</pre>	

## Configure Permitted Ethertype ACL Rules

### Commands

**permit ethertype** <short(0-65535)>

{**any** | src < mac -address> | < mac -address> < mac -mask>}

[{ **any** | dst < mac -address> | < mac -address> < mac -mask> }]

[**vlan** <short(1-4094)>]

[**cos** <short(0-7)>]

[**redirect interface** <interface-type> <interface-id> ]

[**cos-remark** <short(0-7)>]

<b>Syntax Description</b>	<b>permit</b>	Configure the permitted ACL rule
	<b>ethertype</b>	Configure the ethertype related parameters
	(0-65535)	Ethertype value to filter
	<b>any</b>	Configure the filtering of a rule to any address
	src	Configure the source related ACL parameters
	(mac-addr/mask)	Configure the filtering of a rule to a specific address/mask
	<b>any</b>	Configure the filtering of a rule to any address
	<b>dst</b>	Configure the destination related ACL parameters
	(mac-addr/mask)	Configure the filtering of a rule to a specific address/mask
	<b>vlan</b>	Configure the vlan related ACL parameters
	(1-4094)	VLAN index value to filter
	<b>cos</b>	Configure the cos related ACL parameters
	(0-7)	Cos value to filter
	<b>redirect</b>	Configure the redirect related ACL parameters
	<b>interface</b>	Configure the interface related ACL parameters
	(interface-type /interface-id)	Interface to redirect packets that hits ACL rules
<b>cos-remark</b>	Configure the cos-remark related ACL parameters	
(0-7)	Cos value to remark	
<b>Defaults</b>	N/A	
<b>Command Modes</b>	IP Access-list Configuration Mode	
<b>Usage Guidelines</b>	Only support redirect in inbound traffic Only support DSCP remarking in outbound traffic	
<b>Examples</b>	<pre>moxa(config-mac-acl)# permit ethertype 10 00:90:e8:00:00:12 ff:ff:ff:ff:00 00:90:e8:00:00:33 ff:ff:ff:ff:00  moxa(config-mac-acl)# permit ethertype 10 any any vlan 2 cos 1  moxa(config-mac-acl)# permit ethertype 10 any any redirect interface ethernet 1/1  moxa(config-mac-acl)# permit ethertype 10 any any cos-remark 7</pre>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	<pre>no rule &lt;short(1-10)&gt; no ip access-list &lt;short(1-16)&gt; show ip access-list &lt;short(1-16)&gt;</pre>	

## Configure Unacceptable MAC ACL Rules

### Commands

#### deny

{**any** | src < mac -address> | < mac -address> < mac -mask>}

[{ **any** | dst < mac -address> | < mac -address> < mac -mask> }]

[**vlan** <short(1-4094)>]

[**cos** <short(0-7)>]

<b>Syntax Description</b>	<b>deny</b>	Configure the unacceptable ACL rule
	<b>any</b>	Configure the filtering of a rule to any address
	<b>src</b>	Configure the source related ACL parameters
	(mac-addr/mask)	Configure the filtering of a rule to a specific address/mask
	<b>any</b>	Configure the filtering of a rule to any address
	<b>dst</b>	Configure the destination related ACL parameters
	(mac-addr/mask)	Configure the filtering of a rule to a specific address/mask
	<b>vlan</b>	Configure the vlan related ACL parameters
	(1-4094)	VLAN index value to filter
	<b>cos</b>	Configure the cos related ACL parameters
	(0-7)	Cos value to filter
<b>Defaults</b>	N/A	
<b>Command Modes</b>	IP Access-list Configuration Mode	
<b>Usage Guidelines</b>	Only support redirect in inbound traffic	
	Only support DSCP remarking in outbound traffic	
<b>Examples</b>	moxa(config-mac-acl)# deny 00:90:e8:00:00:12 ff:ff:ff:ff:ff:00 00:90:e8:00:00:33 ff:ff:ff:ff:ff:00	
	moxa(config-mac-acl)# deny any any vlan 2 cos 1	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	no rule <short(1-10)>	
	no ip access-list <short(1-16)>	
	show ip access-list <short(1-16)>	

## Configure Unacceptable Goose ACL Rules

### Commands

#### deny goose

{**any** | src < mac -address> | < mac -address> < mac -mask>}

[{ **any** | dst < mac -address> | < mac -address> < mac -mask> }]

[**vlan** <short(1-4094)>]

[**cos** <short(0-7)>]

<b>Syntax Description</b>	<b>deny</b>	Configure the unacceptable ACL rule
	<b>goose</b>	Configure the goose related ACL parameters
	<b>any</b>	Configure the filtering of a rule to any address
	src	Configure the source related ACL parameters
	(mac-addr/mask)	Configure the filtering of a rule to a specific address/mask
	<b>any</b>	Configure the filtering of a rule to any address
	<b>dst</b>	Configure the destination related ACL parameters
	(mac-addr/mask)	Configure the filtering of a rule to a specific address/mask
	<b>vlan</b>	Configure the vlan related ACL parameters
	(1-4094)	VLAN index value to filter
<b>cos</b>	Configure the cos related ACL parameters	
(0-7)	Cos value to filter	
<b>Defaults</b>	N/A	
<b>Command Modes</b>	IP Access-list Configuration Mode	
<b>Usage Guidelines</b>	Only support redirect in inbound traffic	
	Only support DSCP remarking in outbound traffic	
<b>Examples</b>	moxa(config-mac-acl)# deny goose 00:90:e8:00:00:12 ff:ff:ff:ff:00 00:90:e8:00:00:33 ff:ff:ff:ff:00	
	moxa(config-mac-acl)# deny goose any any vlan 2 cos 1	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	no rule <short(1-10)>	
	no ip access-list <short(1-16)>	
	show ip access-list <short(1-16)>	

## Configure Unacceptable SMV ACL Rules

### Commands

#### deny smv

{**any** | src < mac -address> | < mac -address> < mac -mask>}

[{ **any** | dst < mac -address> | < mac -address> < mac -mask> }]

[**vlan** <short(1-4094)>]

[**cos** <short(0-7)>]

<b>Syntax Description</b>	<b>deny</b>	Configure the unacceptable ACL rule
	<b>smv</b>	Configure the smv related ACL parameters
	<b>any</b>	Configure the filtering of a rule to any address
	src	Configure the source related ACL parameters
	(mac-addr/mask)	Configure the filtering of a rule to a specific address/mask
	<b>any</b>	Configure the filtering of a rule to any address
	<b>dst</b>	Configure the destination related ACL parameters
	(mac-addr/mask)	Configure the filtering of a rule to a specific address/mask
	<b>vlan</b>	Configure the vlan related ACL parameters
	(1-4094)	VLAN index value to filter
<b>cos</b>	Configure the cos related ACL parameters	
(0-7)	Cos value to filter	
<b>Defaults</b>	N/A	
<b>Command Modes</b>	IP Access-list Configuration Mode	
<b>Usage Guidelines</b>	Only support redirect in inbound traffic	
	Only support DSCP remarking in outbound traffic	
<b>Examples</b>	moxa(config-mac-acl)# deny smv 00:90:e8:00:00:12 ff:ff:ff:ff:00 00:90:e8:00:00:33 ff:ff:ff:ff:00	
	moxa(config-mac-acl)# deny smv any any vlan 2 cos 1	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	no rule <short(1-10)>	
	no ip access-list <short(1-16)>	
	show ip access-list <short(1-16)>	

## Configure Unacceptable Ethertype ACL Rules

### Commands

**deny ethertype** <short(0-65535)>

{**any** | src < mac -address> | < mac -address> < mac -mask>}

[{ **any** | dst < mac -address> | < mac -address> < mac -mask> }]

[**vlan** <short(1-4094)>]

[**cos** <short(0-7)>]

<b>Syntax Description</b>	<b>deny</b>	Configure the unacceptable ACL rule
	<b>ethertype</b>	Configure the Ethertype related ACL parameters
	<b>(0-65535)</b>	Ethertype value to filter
	<b>any</b>	Configure the filtering of a rule to any address
	src	Configure the source related ACL parameters
	(mac-addr/mask)	Configure the filtering of a rule to a specific address/mask
	<b>any</b>	Configure the filtering of a rule to any address
	<b>dst</b>	Configure the destination related ACL parameters
	(mac-addr/mask)	Configure the filtering of a rule to a specific address/mask
	<b>vlan</b>	Configure the vlan related ACL parameters
	(1-4094)	VLAN index value to filter
<b>cos</b>	Configure the cos related ACL parameters	
(0-7)	Cos value to filter	
<b>Defaults</b>	N/A	
<b>Command Modes</b>	IP Access-list Configuration Mode	
<b>Usage Guidelines</b>	Only support redirect in inbound traffic Only support DSCP remarking in outbound traffic	
<b>Examples</b>	<pre>moxa(config-mac-acl)# deny ethertype 00:90:e8:00:00:12 ff:ff:ff:ff:00 00:90:e8:00:00:33 ff:ff:ff:ff:00  moxa(config-mac-acl)# deny ethertype 10 any any vlan 2 cos 1</pre>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	no rule <short(1-10)> no ip access-list <short(1-16)> show ip access-list <short(1-16)>	

## Enable/Disable a MAC ACL Rule

### Commands

**rule** <short(1-10)> {**enable** | **disable**}

<b>Syntax Description</b>	<b>rule</b>	Configure the rule related ACL parameters
	(1-10)	Rule index
	<b>enable</b>	Enable the rule
	<b>disable</b>	Disable the rule
<b>Defaults</b>	N/A	
<b>Command Modes</b>	IP Access-list Configuration Mode	
<b>Usage Guidelines</b>		
<b>Examples</b>	<pre>moxa(config-mac-acl)# rule 9 enable moxa(config-mac-acl)# rule 9 disable</pre>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	show ip access-list <short(1-16)>	



## Remove MAC ACL Rules

### Commands

**no rule** <short(1-10)>

<b>Syntax Description</b>	<b>no</b>	Remove configure/delete entry/reset to default value
	<b>rule</b>	Configure the rule related ACL parameters
	(1-10)	Rule index
<b>Defaults</b>	N/A	
<b>Command Modes</b>	IP Access-list Configuration Mode	
<b>Usage Guidelines</b>		
<b>Examples</b>	moxa(config-ip-acl)# no rule 9	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	show ip access-list <short(1-16)>	

## Remove a MAC Access-list

### Commands

**no mac access-list** <short(1-16)>

<b>Syntax Description</b>	<b>no</b>	Remove configuration / delete entry / reset to default value
	<b>mac</b>	Configure MAC related parameters
	<b>access-list</b>	Configure ACL related parameters
	1-16	Access control list index
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global Configuration Mode	
<b>Usage Guidelines</b>		
<b>Examples</b>	moxa(config)# no mac access-list 10	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	mac access-list <short(1-16)>	

## Apply an IPv4 Access-list to a Port Interface

### Commands

**ip access-list** <short(1-16)> { in | out }

<b>Syntax Description</b>	<b>ip</b>	Configure IP related parameters
	<b>access-list</b>	Configure ACL related parameters
	1-16	Access control list index
	<b>in</b>	Apply IP access-list to inbound traffic
	<b>out</b>	Apply IP access-list to outbound traffic
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global Configuration Mode	
<b>Usage Guidelines</b>	The maximum activated ACL groups are 16 (IP-based + MAC-based combined)	
<b>Examples</b>	moxa(config-if)# ip access-list 10 in  moxa(config-if)# ip access-list 10 out	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	ip access-list <short(1-16)> no ip access-list <short(1-16)> { in   out }	

## Apply an IPv4 Access-list to a VLAN Interface

### Commands

**ip access-list** <short(1-16)> { in | out }

<b>Syntax Description</b>	<b>ip</b>	Configure IP related parameters
	<b>access-list</b>	Configure ACL related parameters
	1-16	Access control list index
	<b>in</b>	Apply IP access-list to inbound traffic
	<b>out</b>	Apply IP access-list to outbound traffic
<b>Defaults</b>	N/A	
<b>Command Modes</b>	VLAN interface Configuration Mode	
<b>Usage Guidelines</b>	The maximum activated ACL groups are 16 (IP-based + MAC-based combined)	
<b>Examples</b>	moxa(config-vlan)# ip access-list 10 in	
	moxa(config-vlan)# ip access-list 10 out	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	ip access-list <short(1-16)> no ip access-list <short(1-16)> { in   out }	

## Remove an IPv4 Access-list to a Port Interface

### Commands

**no mac access-list** <short(1-16)> { in | out }

<b>Syntax Description</b>	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>mac</b>	Configure MAC related parameters
	<b>access-list</b>	Configure ACL related parameters
	1-16	Access control list index
	<b>in</b>	Apply IP access-list to inbound traffic
	<b>out</b>	Apply IP access-list to outbound traffic
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Port Interface Configuration Mode	
<b>Usage Guidelines</b>	The maximum activated ACL groups are 16 (IP-based + MAC-based combined)	
<b>Examples</b>	moxa(config-if)# no ip access-list 10 in	
	moxa(config-if)# no ip access-list 10 out	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	ip access-list <short(1-16)> no ip access-list <short(1-16)> { in   out }	

## Remove an IPv4 Access-list to a VLAN Interface

### Commands

**no ip access-list** <short(1-16)> { **in** | **out** }

<b>Syntax Description</b>	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>ip</b>	Configure IP related parameters
	<b>access-list</b>	Configure ACL related parameters
	1-16	Access control list index
	<b>in</b>	Apply IP access-list to inbound traffic
	<b>out</b>	Apply IP access-list to outbound traffic
<b>Defaults</b>	N/A	
<b>Command Modes</b>	VLAN Interface Configuration Mode	
<b>Usage Guidelines</b>	The maximum activated ACL groups are 16 (IP-based + MAC-based combined)	
<b>Examples</b>	moxa(config-vlan)# no ip access-list 10 in	
	moxa(config-vlan)# no ip access-list 10 out	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	ip access-list <short(1-16)> no ip access-list <short(1-16)> { in   out }	

## Apply a MAC Access-list to a Port Interface

### Commands

**mac access-list** <short(1-16)> { **in** | **out** }

<b>Syntax Description</b>	<b>mac</b>	Configure MAC related parameters
	<b>access-list</b>	Configure ACL related parameters
	1-16	Access control list index
	<b>in</b>	Apply IP access-list to inbound traffic
	<b>out</b>	Apply IP access-list to outbound traffic
	<b>Defaults</b>	N/A
<b>Command Modes</b>	Port Interface Configuration Mode	
<b>Usage Guidelines</b>	The maximum activated ACL groups are 16 (IP-based + MAC-based combined)	
<b>Examples</b>	moxa(config-if)# mac access-list 10 in	
	moxa(config-if)# mac access-list 10 out	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	mac access-list <short(1-16)> no mac access-list <short(1-16)> { in   out }	

## Apply a MAC Access-list to a VLAN Interface

### Commands

**mac access-list** <short(1-16)> { **in** | **out** }

<b>Syntax Description</b>	<b>mac</b>	Configure MAC related parameters
	<b>access-list</b>	Configure ACL related parameters
	1-16	Access control list index
	<b>in</b>	Apply IP access-list to inbound traffic
	<b>out</b>	Apply IP access-list to outbound traffic
	<b>Defaults</b>	N/A
<b>Command Modes</b>	VLAN Interface Configuration Mode	
<b>Usage Guidelines</b>	The maximum activated ACL groups are 16 (IP-based + MAC-based combined)	
<b>Examples</b>	moxa(config-vlan)# mac access-list 10 in	
	moxa(config-vlan)# mac access-list 10 out	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	mac access-list <short(1-16)> no mac access-list <short(1-16)> { in   out }	

## Remove a MAC Access-list to a Port Interface

### Commands

**no mac access-list** <short(1-16)> { **in** | **out** }

<b>Syntax Description</b>	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>mac</b>	Configure MAC related parameters
	<b>access-list</b>	Configure ACL related parameters
	1-16	Access control list index
	<b>in</b>	Apply IP access-list to inbound traffic
	<b>out</b>	Apply IP access-list to outbound traffic
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Port Interface Configuration Mode	
<b>Usage Guidelines</b>	The maximum activated ACL groups are 16 (IP-based + MAC-based combined)	
<b>Examples</b>	moxa(config-if)# no mac access-list 10 in	
	moxa(config-if)# no mac access-list 10 out	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	mac access-list <short(1-16)> no mac access-list <short(1-16)> { in   out }	

## Remove a MAC Access-list to a VLAN Interface

### Commands

**no mac access-list** <short(1-16)> { in | out }

<b>Syntax Description</b>	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>mac</b>	Configure MAC related parameters
	<b>access-list</b>	Configure ACL related parameters
	1-16	Access control list index
	<b>in</b>	Apply IP access-list to inbound traffic
	<b>out</b>	Apply IP access-list to outbound traffic
<b>Defaults</b>	N/A	
<b>Command Modes</b>	VLAN Interface Configuration Mode	
<b>Usage Guidelines</b>	The maximum activated ACL groups are 16 (IP-based + MAC-based combined)	
<b>Examples</b>	<pre>moxa(config-vlan)# no mac access-list 10 in moxa(config-vlan)# no mac access-list 10 out</pre>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	<pre>mac access-list &lt;short(1-16)&gt; no mac access-list &lt;short(1-16)&gt; { in   out }</pre>	

## Show All Access-lists

### Commands

**show access-list**

<b>Syntax Description</b>	<b>show</b>	Display configuration/status information
	<b>access-list</b>	Configure ACL related parameters
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC Mode	
<b>Usage Guidelines</b>	This command shows both IP and MAC address lists	
<b>Examples</b>	<pre>moxa# show access-list  Mac Access List 1  Name           : MyACL1 Out VLAN List  : 1  ----- Rule Index      : 1 Rule Status     : enabled Rule Type       : permit Ethertype       : any Source MAC Address      : 00:00:01:00:02:03/FF:FF:FF:FF:FF:00 Destination MAC Address : 00:00:01:00:02:04/FF:FF:FF:FF:FF:00 Cos             : 7 Action          : Remark cos to 3  ----- Mac Access List 10  Name           : In VLAN List   : Out VLAN List  : 3  ----- Rule Index      : 1 Rule Status     : enabled Rule Type       : permit Ethertype       : any Source MAC Address      : any</pre>	

Destination MAC Address	: any
Cos	: any
Action	: None
-----	
Ip Access List 1	
Name	: IP-ACL-1
In Port List	: Eth1/1, Eth1/2, Eth1/3, Eth3/4, Eth4/1 Eth6/2, Eth6/3, Eth7/2, Eth7/3
Out Port List	: Eth1/1, Eth1/2, Eth3/3, Eth3/4, Eth6/1 Eth6/2, Eth7/1, Eth7/2, Eth7/4
-----	
Rule Index	: 1
Rule Status	: enabled
Rule Type	: permit
Protocol	: any
Source IP Address	: any
Destination IP Address	: any
Dscp	: any
Action	: Redirect to Eth 6/2
-----	
Source Port	: 333
Destination Port	: 22
Dscp	: any
Action	: None
Error Messages	N/A
Related Commands	ip access-list <short(1-16)> mac access-list <short(1-16)>

## Show All IPv4 Access-lists

### Commands

#### show ip access-list

<b>Syntax Description</b>	<b>show</b>	Display configuration/status information
	<b>ip</b>	Display IP related information
	<b>access-list</b>	Configure ACL related parameters
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# show ip access-lists	
	Ip Access List 1	
	Name : IP-ACL-1	
	In Port List : Eth1/1, Eth1/2, Eth1/3, Eth3/4, Eth4/1 Eth6/2, Eth6/3, Eth7/2, Eth7/3	
	Out Port List : Eth1/1, Eth1/2, Eth3/3, Eth3/4, Eth6/1 Eth6/2, Eth7/1, Eth7/2, Eth7/4	
-----		
	Rule Index	: 1
	Rule Status	: enabled
	Rule Type	: permit
	Protocol	: any
	Source IP Address	: any
	Destination IP Address	: any
	Dscp	: any
	Action	: Redirect to Eth 6/2
-----		
	Destination IP Address	: any

	<pre> ICMP Type           : 3 ICMP Code           : 15 Dscp                 : any Action               : None ----- Ip Access List 2  Name                : 123 In VLAN List        : 1, 300, 2536, 4094 Out VLAN List       : 2, 40, 336, 594 </pre>
<b>Error Messages</b>	N/A
<b>Related Commands</b>	ip access-list <short(1-16)>

## Show Specific IPv4 Access-list

### Commands

**show ip access-list** <short(1-16)>

<b>Syntax Description</b>	<b>show</b>	Display configuration/status information
	<b>ip</b>	Display IP related information
	<b>access-list</b>	Configure ACL related parameters
	(1-16)	ACL index to display
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<pre> moxa# show ip access-list 3  Ip Access List 3  Name: ----- Rule Index           : 1 Rule Status          : enabled Rule Type            : permit Protocol             : UDP Source IP Address    : any Destination IP Address : any Source Port          : 333 Destination Port     : 22 Dscp                 : any Action               : Remark dscp to 12 ----- Rule Index           : 2 Rule Status          : enabled Rule Type            : permit Protocol             : any Source IP Address    : any Destination IP Address : any Dscp                 : any Action               : Redirect to Eth 2/2                     Remark dscp to 36 ----- Rule Index           : 3 Rule Status          : enabled Rule Type            : permit Protocol             : any Source IP Address    : any Destination IP Address : any Dscp                 : any Action               : Mirror to Session 5 </pre>	

	Remark dscp to 36
	-----
	Rule Index : 4
	Rule Status : enabled
	Rule Type : permit
	Protocol : any
	Source IP Address : any
	Destination IP Address : any
	Dscp : any
	Action : Mirror to Session 5
	-----
	Rule Index : 5
	Rule Status : enabled
	Rule Type : permit
	Protocol : any
	Source IP Address : any
	Destination IP Address : any
	Dscp : any
	Action : Redirect to Eth 2/2
<b>Error Messages</b>	N/A
<b>Related Commands</b>	ip access-list <short(1-16)>

## Show All MAC Access-lists

### Commands

#### show mac access-list

<b>Syntax Description</b>	<b>show</b>	Display configuration/status information
	<b>mac</b>	Display MAC related information
	<b>access-list</b>	Configure ACL related parameters
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<pre>moxa# show mac access-list  Mac Access List 1  Name          : MyACL1 Out VLAN List : 1  -----  Rule Index      : 1 Rule Status     : enabled Rule Type       : permit EtherType       : any Source MAC Address : 00:00:01:00:02:03/FF:FF:FF:FF:FF:00 Destination MAC Address : 00:00:01:00:02:04/FF:FF:FF:FF:FF:00 Cos             : 7 Action          : Remark cos to 3  -----  Rule Index      : 2 Rule Status     : enabled Rule Type       : permit EtherType       : any Source MAC Address : 00:00:01:00:02:03/FF:FF:FF:FF:FF:00 Destination MAC Address : 00:00:01:00:02:04/FF:FF:FF:FF:FF:00:00 Cos             : 7 Action          : Remark cos to 3  -----  Mac Access List 10</pre>	



	Name : In VLAN List : Out VLAN List : 3 ----- Rule Index : 1 Rule Status : enabled Rule Type : permit Ethertype : any Source MAC Address : any Destination MAC Address : any Cos : any Action : None -----
<b>Error Messages</b>	N/A
<b>Related Commands</b>	mac access-list <short(1-16)>

## Show Specific MAC Access-list

### Commands

**show mac access-list** <short(1-16)>

<b>Syntax Description</b>	<b>show</b>	Display configuration/status information
	<b>mac</b>	Display MAC related information
	<b>access-list</b>	Configure ACL related parameters
	(1-16)	ACL index to display
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# show mac access-lists 1  Mac Access List 1  Name : MyACL1 Out VLAN List : 1  ----- Rule Index : 1 Rule Status : enabled Rule Type : permit Ethertype : any Source MAC Address : 00:00:01:00:02:03/FF:FF:FF:FF:FF:00 Destination MAC Address : 00:00:01:00:02:04/FF:FF:FF:FF:FF:00 Cos : 7 Action : Remark cos to 3  ----- Rule Index : 2 Rule Status : enabled Rule Type : permit Ethertype : any Source MAC Address : 00:00:01:00:02:03/FF:FF:FF:FF:FF:00 Destination MAC Address : 00:00:01:00:02:04/FF:FF:FF:FF:00:00 Cos : 7 Action : Remark cos to 3  -----	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	mac access-list <short(1-16)>	

## Show Port Access-list Configuration

### Commands

**show interface** <interface-type> <interface-id> **access-list**

<b>Syntax Description</b>	<b>show</b>	Display configuration/status information
	<b>interface</b>	Display interface related information
	<interface-type/interface id>	Port index to display
	<b>access-list</b>	Configure ACL related parameters
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# show interface ethernet 1/1 access-list	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	ip access-list <short(1-16)> { in   out } mac access-list <short(1-16)> { in   out }	

## Show VLAN Access-list Configuration

### Commands

**show vlan id** <short(1-4094)> **access-list**

<b>Syntax Description</b>	<b>show</b>	Display configuration/status information
	<b>vlan</b>	Display VLAN related information
	<b>id</b>	Display VLAN index related information
	<1-4094>	VLAN index to display
	<b>access-list</b>	Configure ACL related parameters
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# show vlan id 1 access-list	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	ip access-list <short(1-16)> { in   out } mac access-list <short(1-16)> { in   out }	

## Network Loop Protection

### Enable/Disable Network Loop Protection

#### Commands

**loop-protect** { enable | disable }

<b>Syntax Descriptions</b>	<b>loop-protect</b>	Configure Loop Protection parameters
	enable	Enable Loop Protection
	disable	Disable Loop Protection
<b>Defaults</b>	Disable	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	Product(config)# loop-protect enable	
<b>Error messages</b>	N/A	
<b>Related commands</b>	show loop-protect	

## Configure the Network Loop Protection Detection Interval

### Commands

**loop protect detect-interval** <integer(1-30)>

<b>Syntax Descriptions</b>	<b>loop-protect</b>	Configure Loop Protection parameters
	<b>detect-interval</b>	Configures loop detection frame interval
	<integer(1-30)>	Specify the interval (in seconds) at which the system will send loop detection frames
<b>Defaults</b>	10	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	Product(config)# loop-protect detect-interval 5	
<b>Error messages</b>	N/A	
<b>Related commands</b>	show loop-protect	

## Show Network Loop Protection Information

### Commands

**show loop-protect**

<b>Syntax Descriptions</b>	<b>Show</b>	Display configuration/status information																																																						
	<b>loop-protect</b>	Display Loop Protection information																																																						
<b>Defaults</b>	N/A																																																							
<b>Command Modes</b>	Privileged EXEC Mode																																																							
<b>Usage Guidelines</b>	N/A																																																							
<b>Examples</b>	<pre>moxa# show loop-protect   Loop Protection Status : Enabled   Detection interval:    : 1 sec</pre> <table border="1"> <thead> <tr> <th>Ports</th> <th>Loop Status</th> <th>Port Status</th> <th>Peer Port</th> </tr> </thead> <tbody> <tr><td>Eth1/1</td><td>Normal</td><td>--</td><td></td></tr> <tr><td>Eth1/2</td><td>Normal</td><td>--</td><td></td></tr> <tr><td>Eth1/3</td><td>Normal</td><td>--</td><td></td></tr> <tr><td>Eth1/4</td><td>Normal</td><td>--</td><td></td></tr> <tr><td>Eth1/5</td><td>Normal</td><td>--</td><td></td></tr> <tr><td>Eth1/6</td><td>Normal</td><td>--</td><td></td></tr> <tr><td>Eth1/7</td><td>Normal</td><td>--</td><td></td></tr> <tr><td>Eth1/8</td><td>Normal</td><td>--</td><td></td></tr> <tr><td>Eth1/9</td><td>Normal</td><td>--</td><td></td></tr> <tr><td>Eth1/10</td><td>Normal</td><td>--</td><td></td></tr> <tr><td>Eth1/11</td><td>Looping</td><td>Disabled</td><td>Eth1/12</td></tr> <tr><td>Eth1/12</td><td>Looping</td><td>Disabled</td><td>Eth1/11</td></tr> </tbody> </table>				Ports	Loop Status	Port Status	Peer Port	Eth1/1	Normal	--		Eth1/2	Normal	--		Eth1/3	Normal	--		Eth1/4	Normal	--		Eth1/5	Normal	--		Eth1/6	Normal	--		Eth1/7	Normal	--		Eth1/8	Normal	--		Eth1/9	Normal	--		Eth1/10	Normal	--		Eth1/11	Looping	Disabled	Eth1/12	Eth1/12	Looping	Disabled	Eth1/11
Ports	Loop Status	Port Status	Peer Port																																																					
Eth1/1	Normal	--																																																						
Eth1/2	Normal	--																																																						
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Eth1/8	Normal	--																																																						
Eth1/9	Normal	--																																																						
Eth1/10	Normal	--																																																						
Eth1/11	Looping	Disabled	Eth1/12																																																					
Eth1/12	Looping	Disabled	Eth1/11																																																					
<b>Error messages</b>	N/A																																																							
<b>Related commands</b>	N/A																																																							

## DHCP Snooping

### Enable/Disable DHCP Snooping

#### Commands

**ip dhcp snooping** { enable | disable }

<b>Syntax Descriptions</b>	<b>ip</b>	Configure IP-related parameters
----------------------------	-----------	---------------------------------

	<b>dhcp</b>	Configure DHCP-related parameters
	<b>snooping</b>	Configure DHCP Snooping parameters
	Enable	Globally enable DHCP snooping
	Disable	Globally disable DHCP snooping
<b>Defaults</b>	Disable	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	Product(config)# ip dhcp snooping enable	
<b>Error messages</b>	N/A	
<b>Related commands</b>	N/A	

## Enable/Disable DHCP Snooping on a Specific VLAN

### Commands

**ip dhcp snooping vlan** <vlan-id>

**no ip dhcp snooping vlan** <vlan-id>

<b>Syntax Descriptions</b>	<b>ip</b>	Configure IP-related parameters
	<b>dhcp</b>	Configure DHCP-related parameters
	<b>snooping</b>	Configure DHCP Snooping parameters
	<b>vlan</b>	Configure VLAN parameters
	<vlan-id>	Specify the VLAN ID
<b>Defaults</b>	Disable	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	Product(config)# ip dhcp snooping vlan 2	
<b>Error messages</b>	If user enables DHCP Snooping on same VLAN: Product(config)# ip dhcp snooping vlan 2 Not valid: There should not be two entries with the same VLAN ID.	
<b>Related commands</b>	N/A	

## Set the DHCP Snooping Port Status to Trusted/Untrusted

### Commands

**ip dhcp snooping** { trust | untrust }

<b>Syntax Descriptions</b>	<b>ip</b>	Configure IP-related parameters
	<b>dhcp</b>	Configure DHCP-related parameters
	<b>snooping</b>	Configure DHCP Snooping parameters
	trust	Set the DHCP snooping port status to trusted
	untrust	Set the DHCP snooping port status to untrusted
<b>Defaults</b>	Untrusted	
<b>Command Modes</b>	Interface configuration mode	
<b>Usage Guidelines</b>	This command configures the DHCP snooping port status	
<b>Examples</b>	Product(config-if)# ip dhcp snooping trust	
<b>Error messages</b>	If port is enabled IP source guard, and user change port status to trusted: Product(config-if)# ip dhcp snooping trust This port is enabled for IP Source Guard. IP Source Guard can only be enabled on an untrusted port.  If port is enabled Dynamic ARP Inspection, and user change port status to trusted: Product(config-if)# ip dhcp snooping trust This port is enabled for Dynamic ARP Inspection. Dynamic ARP Inspection can only be enabled on an untrusted port.	

	Change port status on member port: Product(config-if)# ip dhcp snooping trust This port is a member of Port-Channel. DHCP Snooping cannot be enabled on a member port.
<b>Related commands</b>	N/A

## Add/Delete a DHCP Snooping Binding Entry

### Commands

**ip dhcp snooping binding** <src\_mac> **vlan** <vlan-id> <src\_ip> **interface** <interface-type> < slot number>/<port number>

**no ip dhcp snooping binding** <src\_mac> vlan <vlan-id>

<b>Syntax Descriptions</b>	<b>ip</b>	Configure IP-related parameters
	<b>dhcp</b>	Configure DHCP-related parameters
	<b>snooping</b>	Configure DHCP Snooping parameters
	<b>binding</b>	Configure DHCP snooping binding entries
	<src mac>	Specify the source MAC address
	<b>vlan</b>	Configure VLAN parameters
	<vlan id>	Specify the VLAN ID
	<src ip>	Specify the source IP address
	<b>Interface</b>	Configure interface parameters
	<interface-type>	Specify the interface type
	<slot number>	Specify the slot number
<port number>	Specify the port number	
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	This command adds a DHCP snooping binding entry. Use the no version of this command to delete an entry.	
<b>Examples</b>	Product(config)# ip dhcp snooping binding 01:23:45:56:78:86 vlan 1 192.168.127.253 interface ethernet 1/1	
<b>Error messages</b>	If user sets two entry with same VLAN and MAC address: Product(config)# ip dhcp snooping binding 01:23:45:56:78:86 vlan 1 192.168.127.252 interface ethernet 1/2 Not valid: There should not be two entries with the same VLAN ID and Mac Address.	
	If user sets a port channel that does not exist : Product(config)# ip dhcp snooping binding 01:23:45:56:78:86 vlan 1 192.168.127.252 interface port-channel 2 Not valid: The Port-Channel does not exist.	
	If user sets a member port: Product(config)# ip dhcp snooping binding 01:23:45:56:78:86 vlan 1 192.168.127.252 interface ethernet 1/3 Not valid: The port is a member of Port-Channel.	
<b>Related commands</b>	N/A	

## Show DHCP Snooping Information.

### Commands

**show ip dhcp snooping** [{ interface | vlan <vlan-id> | binding}

<b>Syntax Description</b>	<b>show</b>	Display configuration/status information
	<b>ip</b>	Show IP-related configuration information
	<b>dhcp</b>	Show DHCP-related configuration information
	<b>snooping</b>	Show DHCP Snooping information

	interface	Display DHCP snooping interface information
	<b>vlan</b>	Display the configuration and statistics of DHCP snooping on a specific VLAN
	<vlan id>	Specify the VLAN ID
	Binding	Display the DHCP snooping binding database
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC Mode	
<b>Usage Guidelines</b>	This command displays DHCP snooping information.	
<b>Examples</b>	<pre> moxa# show ip dhcp snooping Layer 2 DHCP Snooping is globally disabled  moxa# show ip dhcp snooping Layer 2 DHCP Snooping is globally enabled MAC Address verification is enabled  moxa# show ip dhcp snooping interface Interface  DHCP Snooping Port Status -----  ----- Eth1/1    Untrusted Eth1/2    Untrusted Eth1/3    Untrusted Eth1/4    Untrusted  moxa# show ip dhcp snooping vlan 1 DHCP Snooping Vlan information ----- VLAN : 1 Snooping status : Enabled Number of Incoming Discovers : 0 Number of Incoming Requests : 0 Number of Incoming Releases : 0 Number of Incoming Declines : 0 Number of Incoming Informs : 0 Number of Transmitted Offers : 0 Number of Transmitted Acks : 0 Number of Transmitted Naks : 0 Total Number Of Discards : 0 Number of MAC Discards : 0 Number of Server Discards : 0  moxa# show ip dhcp snooping vlan 2 DHCP Snooping Vlan information ----- VLAN : 2 Snooping status : Disabled  moxa# show ip dhcp snopping binding DHCP Snooping Binding Information ----- VLAN MacAddress      IpAddress Interface Type  Lease ----- - 1    00:10:12:13:13:15 12.0.0.1  Eth1/1  static infinite 1    68:05:ca:2e:37:39 12.0.0.2  Eth2/4  dhcp    113 </pre>	
<b>Error messages</b>	N/A	
<b>Related commands</b>	N/A	

## IP Source Guard

### Enable/Disable IP Source Guard

#### Commands

**ip source guard**

**no ip source guard**

<b>Syntax Descriptions</b>	ip source guard	Enable IP source guard.
	no ip source guard	Disable IP source guard.
<b>Defaults</b>	Disable	
<b>Command Modes</b>	Interface configuration mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	Enable on untrusted interface: Product(config-if)# ip source guard	
<b>Error messages</b>	Enable on DHCP Snooping trusted interface: Product(config-if)# ip source guard IP Source Guard must be enabled on a DHCP Snooping untrusted interface.	
	Enable on member port: Product(config-if)# ip source guard This port is a member of Port-Channel. IP Source Guard cannot be enabled on a member port.	

### Show IP Source Guard Interface Status

#### Commands

**show ip source guard**

<b>Syntax Descriptions</b>	show ip source guard	Display the IP source guard interface status
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC Mode	
<b>Usage Guidelines</b>	This command displays IP source guard information.	
<b>Examples</b>	moxa# show ip source guard Interface    IP Source Guard Status ----- Eth1/1      Disabled Eth1/2      Disabled Eth1/3      Disabled Eth1/4      Disabled Eth2/1      Disabled	
<b>Error messages</b>	N/A	

## Dynamic ARP Inspection

### Enable/Disable Dynamic ARP Inspection

#### Commands

**ip arp inspection**

**no ip arp inspection**

<b>Syntax Descriptions</b>	ip arp inspection	Enable dynamic ARP inspection
	no ip arp inspection	Disable dynamic ARP inspection
<b>Defaults</b>	disable	

<b>Command Modes</b>	interface configuration mode
<b>Usage Guidelines</b>	N/A
<b>Examples</b>	Enable on DHCP Snooping untrusted interface: Product(config-if)# ip arp inspection
<b>Error messages</b>	Enable on DHCP Snooping trusted interface: Product(config-if)# ip arp inspection Dynamic ARP Inspection must be enabled on a DHCP Snooping untrusted interface.  Enable on member port: Product(config-if)# ip arp inspection This port is a member of Port-Channel. Dynamic ARP Inspection cannot be enabled on a member port.
<b>Related commands</b>	N/A

## Show Dynamic ARP Inspection

### Commands

#### show ip arp inspection

<b>Syntax Descriptions</b>	show ip arp inspection	Display dynamic ARP inspection interface status
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC Mode	
<b>Usage Guidelines</b>	This command displays Dynamic ARP Inspection information.	
<b>Examples</b>	<pre> Product# show ip arp inspection interfaces Interface      Dynamic ARP Inspection Status ----- Eth1/1         Disabled Eth1/2         Enabled Eth1/3         Disabled Eth1/4         Disabled Eth2/1         Disabled </pre>	
<b>Error messages</b>	N/A	
<b>Related commands</b>	N/A	



# Authentication

## Login Authentication

### Configure Login Authentication Settings

#### Commands

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

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	(config)# login authentication radius (config)# login authentication tacacs (config)# login authentication local (config)# login authentication radius local (config)# login authentication tacacs local	
<b>Error messages</b>	N/A	
<b>Related commands</b>	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 }

<b>Syntax Description</b>	<b>no</b>	Disable the configuration/delete the entry/reset to default value
	<b>radius-server</b>	Configure RADIUS server parameters
	<b>host</b>	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
	<b>Defaults</b>	N/A
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	(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	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Show RADIUS Server Information

### Commands

**show radius-server**

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

<b>Syntax Description</b>	<b>no</b>	Disable the configuration/delete the entry/reset to default value
	<b>tacacs-server</b>	Configure TACACS server parameters
	host	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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	(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	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Show TACACS+ Server Information

### Commands

show tacacs server

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

## Customer Key Management

### Show Customer Key Information

#### Commands

show customer-key info

<b>Syntax Description</b>	<b>show</b>	Display the related information
	<b>customer-key</b>	Display customer key information
	<b>info</b>	Information
<b>Defaults</b>	N/A	
<b>Command Modes</b>	User EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# show customer-key info  Customer key info ----- Private/Certificate Enable:  Yes Label:  111 Algorithm:  RSA Length:  2048  Moxa# show customer-key info  Customer key info -----	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	copy customer-key {<tftp_url>   <sftp_url>} private {<tftp_url>   <sftp_url>} certificate label name clear customer-key signed-config {enable   disable}	

## Clear Customer Key

### Commands

#### clear customer-key

<b>Syntax Description</b>	<b>clear</b>	Clear the key pair
	<b>customer-key</b>	Key pair generated and imported from customer
<b>Defaults</b>	N/A	
<b>Command Modes</b>	User EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# clear customer-key	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	show customer-key info copy customer-key {<tftp_url>   <sftp_url>} private {<tftp_url>   <sftp_url>} certificate label name	

## Enable/Disable Digital Signature

### Commands

#### signed-config {enable | disable}

<b>Syntax Description</b>	<b>signed-config</b>	Digital signature when administrator back up or restore the configuration
	<b>enable</b>	Enable signed-configuration
	<b>disable</b>	Disable signed-configuration
<b>Defaults</b>	Disabled	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# signed-config enable moxa(config)# signed-config disable	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

# Diagnostics

## System Status

### Utilization

#### Show Device Current Information

##### Commands

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

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global configuration / User EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	# show env all # show env power # show env RAM # show env CPU	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

### Statistics

#### Show Traffic Statistics

##### Commands

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

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC Mode.	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# show statistics interface ethernet 1/1	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	clear statistics	

## Clear Traffic Statistics

### Commands

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

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

# Fiber Check

## Show Fiber Check Status

### Commands

**show fiber-check** [interface <iftype> <ifnum>]

<b>Syntax Description</b>	<b>show</b>	Display configuration status information
	<b>fiber-check</b>	Display fiber check information
	<b>interface</b>	Display interface information
	iftype	The interface type
	ifnum	The interface number
<b>Defaults</b>	N/A	
<b>Command Modes</b>	User EXEC Privileged EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<pre> moxa# show fiber-check interface ethernet 3/1 Port Eth3/1   Model Name           : SFP-1GSXLC-T   Serial Number (S/N)  : F821150100   Wavelength (nm)     : 850   Temperature (Fahrenheit) : 106.81   Temperature (Celsius) : 41.56   Voltage (V)          : 3.36   Tx Power (dbm)       : -6.54   Rx Power (dbm)       : N/A   Mode                 : Auto   Temperature Warn (Fahrenheit) : [230.00]   Temperature Warn (Celsius)   : [110.00]   Tx Power Warn (dbm)         : [-12.50, -1.00]   Rx Power Warn (dbm)         : [-21.00, 3.00]  moxa# show fiber-check Port Eth3/1   Model Name           : SFP-1GSXLC-T   Serial Number (S/N)  : F821150100   Wavelength (nm)     : 850   Temperature (Fahrenheit) : 64.18   Temperature (Celsius) : 17.88   Voltage (V)          : 3.36   Tx Power (dbm)       : -6.49   Rx Power (dbm)       : N/A   Mode                 : Auto   Temperature Warn (Fahrenheit) : [230.00]   Temperature Warn (Celsius)   : [110.00]   Tx Power Warn (dbm)         : [-12.50, -1.00]   Rx Power Warn (dbm)         : [-21.00, 3.00]  Port Eth3/2   Model Name           : SFP-1GSXLC-T   Serial Number (S/N)  : G415070280   Wavelength (nm)     : 850   Temperature (Fahrenheit) : 66.14   Temperature (Celsius) : 18.97   Voltage (V)          : 3.36   Tx Power (dbm)       : -6.29   Rx Power (dbm)       : N/A   Mode                 : Auto   Temperature Warn (Fahrenheit) : [230.00]   Temperature Warn (Celsius)   : [110.00] </pre>	

	Tx Power Warn (dbm) : [-12.50, -1.00] Rx Power Warn (dbm) : [-21.00, 3.00]
<b>Error Messages</b>	N/A
<b>Related Commands</b>	fiber-check celsius-temperature-warning {<degrees-celsius(-128-128)>} fiber-check fahrenheit-temperature-warning <degrees-fahrenheit(-198.4-262.4)> fiber-check mode {auto   user-defined} fiber-check rx-power-warning-high <dbm(-40-8.2)> fiber-check rx-power-warning-low <dbm(-40-8.2)> fiber-check tx-power-warning-high <dbm(-40-8.2)> fiber-check tx-power-warning-low <dbm(-40-8.2)>

## Disable Fiber Check Warning Settings

### Commands

no fiber-check

<b>Syntax Description</b>	<b>no</b> <b>fiber-check</b>	Remove configuration/reset to default values Reset fiber check parameters
<b>Defaults</b>	Mode : Auto Temperature Warn (Fahrenheit) : [N/A] Temperature Warn (Celsius) : [N/A] Tx Power Warn (dbm) : [N/A, N/A] Rx Power Warn (dbm) : [N/A, N/A]	
<b>Command Modes</b>	Privileged EXEC Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# no fiber-check	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Clear Fiber Check Warning Settings by Port

### Commands

no fiber-check

<b>Syntax Description</b>	<b>no</b> <b>fiber-check</b>	Remove configuration/reset to default values Reset fiber check parameters
<b>Defaults</b>	Mode : Auto Temperature Warn (Fahrenheit) : [N/A] Temperature Warn (Celsius) : [N/A] Tx Power Warn (dbm) : [N/A, N/A] Rx Power Warn (dbm) : [N/A, N/A]	
<b>Command Modes</b>	Privileged EXEC Interface Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config-if)# no fiber-check	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	



## Configure Fiber Check Warning Mode

### Commands

**fiber-check mode** {auto | user-defined}

<b>Syntax Description</b>	<b>fiber-check</b>	Configure fiber check parameters
	<b>mode</b>	Configure the fiber check warning mode
	auto	Use the preset warning thresholds
	user-defined	Use user-specified warning thresholds
<b>Defaults</b>	The default mode is auto.	
<b>Command Modes</b>	Privileged EXEC Interface Configuration	
<b>Usage Guidelines</b>	In auto mode, the default pre-defined warning threshold values are used. In user-defined mode, the user-specified warning threshold values will be used.	
<b>Examples</b>	moxa(config-if)# fiber-check mode auto	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	show fiber-check [interface <iftype> <ifnum>]	

## Configure Port Fiber Check Temperature (Fahrenheit) Warning Value

### Commands

**fiber-check fahrenheit-temperature-warning** <degrees-fahrenheit(-198.4-262.4)>

<b>Syntax Description</b>	<b>fiber-check</b>	Configure fiber check parameters
	<b>fahrenheit-temperature-warning</b>	Configure the temperature threshold in Fahrenheit
	<degrees-fahrenheit(-198.4-262.4)>	The Fahrenheit temperature warning threshold
<b>Defaults</b>	The default threshold is 262.4 degrees-fahrenheit.	
<b>Command Modes</b>	Privileged EXEC Interface Configuration	
<b>Usage Guidelines</b>	The user-defined temperature threshold will only be used if the fiber check warning mode is set to user-defined.	
<b>Examples</b>	moxa(config-if)# fiber-check fahrenheit-temperature-warning 262.4	
<b>Error Messages</b>	Invalid: The input data is not within the range.	
<b>Related Commands</b>	show fiber-check [interface <iftype> <ifnum>]	

## Configure Port Fiber Check Temperature (Celsius) Warning Value

### Commands

**fiber-check celsius-temperature-warning** <degrees- celsius (-128-128)>

<b>Syntax Description</b>	<b>fiber-check</b>	Configure fiber check parameters
	<b>celsius-temperature-warning</b>	Configure the temperature threshold in Celsius
	<degrees-celsius (-128-128)>	The Celsius temperature warning threshold
<b>Defaults</b>	The default threshold is 128 degrees-celsius.	
<b>Command Modes</b>	Privileged EXEC Interface Configuration	
<b>Usage Guidelines</b>	The user-defined temperature threshold will only be used if the fiber check warning mode is set to user-defined.	
<b>Examples</b>	moxa(config-if)# fiber-check celsius-temperature-warning 128	
<b>Error Messages</b>	Invalid: The input data is not within the range	
<b>Related Commands</b>	show fiber-check [interface <iftype> <ifnum>]	

## Configure Port Fiber Check Maximum Rx Power Threshold Warning Value

### Commands

**fiber-check rx-power-warning-high** <dbm(-40-8.2)>

<b>Syntax Description</b>	<b>fiber-check</b>	Configure fiber check parameters
	<b>rx-power-warning-high</b>	Configure the warning threshold for the maximum Rx power
	<dbm(-40-8.2)>	The maximum Rx power threshold value
<b>Defaults</b>	The default maximum Rx power warning threshold is 8.2 dBm.	
<b>Command Modes</b>	Privileged EXEC Interface Configuration	
<b>Usage Guidelines</b>	The user-defined temperature threshold will only be used if the fiber check warning mode is set to user-defined.	
<b>Examples</b>	moxa(config-if)# fiber-check rx-power-warning-high 8.2	
<b>Error Messages</b>	Invalid: rx-power-warning-low > rx-power-warning-high Invalid: The input data is not within the range (-40 ~ 8.2)	
<b>Related Commands</b>	show fiber-check [interface <iftype> <ifnum>]	

## Configure Port Fiber Check Minimum Rx Power Threshold Warning Value

### Commands

**fiber-check rx-power-warning-low** <dbm(-40-8.2)>

<b>Syntax Description</b>	<b>fiber-check</b>	Configure fiber check parameters
	<b>rx-power-warning-low</b>	Configure the warning threshold for the minimum Rx power
	<dbm(-40-8.2)>	The minimum Rx power threshold value
<b>Defaults</b>	The default minimum Rx power warning threshold is -40 dBm.	
<b>Command Modes</b>	Privileged EXEC Interface Configuration	
<b>Usage Guidelines</b>	The user-defined temperature threshold will only be used if the fiber check warning mode is set to user-defined.	
<b>Examples</b>	moxa(config-if)# fiber-check rx-power-warning-low -40	
<b>Error Messages</b>	Invalid: rx-power-warning-low > rx-power-warning-high Invalid: The input data is not within the range (-40 ~ 8.2)	
<b>Related Commands</b>	show fiber-check [interface <iftype> <ifnum>]	

## Configure Port Fiber Check Tx Power Highest Threshold Warning Value

### Commands

**fiber-check tx-power-warning-high** <dbm(-40-8.2)>

<b>Syntax Description</b>	<b>fiber-check</b>	Configure fiber check parameters
	<b>tx-power-warning-high</b>	Configure the warning threshold for the maximum Tx power
	<dbm(-40-8.2)>	The maximum Tx power threshold value
<b>Defaults</b>	The default maximum Tx power warning threshold is 8.2 dBm.	
<b>Command Modes</b>	Privileged EXEC Interface Configuration	
<b>Usage Guidelines</b>	The user-defined temperature threshold will only be used if the fiber check warning mode is set to user-defined.	
<b>Examples</b>	moxa(config-if)# fiber-check tx-power-warning-high 8.2	
<b>Error Messages</b>	Invalid: tx-power-warning-low > tx-power-warning-high Invalid: The input data is not within the range (-40 ~ 8.2)	
<b>Related Commands</b>	show fiber-check [interface <iftype> <ifnum>]	

## Configure Port Fiber Check Rx Power Lowest Threshold Warning Value

### Commands

**fiber-check tx-power-warning-low** <dbm(-40-8.2)>

<b>Syntax Description</b>	<b>fiber-check</b>	Configure fiber check parameters
	<b>tx-power-warning-low</b>	Configure the warning threshold for the minimum Tx power
	<dbm(-40-8.2)>	The minimum Tx power threshold value
<b>Defaults</b>	The default minimum Tx power warning threshold is -40 dBm.	
<b>Command Modes</b>	Privileged EXEC Interface Configuration	
<b>Usage Guidelines</b>	The user-defined temperature threshold will only be used if the fiber check warning mode is set to user-defined.	
<b>Examples</b>	moxa(config-if)# fiber-check tx-power-warning-low -40	
<b>Error Messages</b>	Invalid: tx-power-warning-low > tx-power-warning-high Invalid: The input data is not within the range (-40 to 8.2)	
<b>Related Commands</b>	show fiber-check [interface <iftype> <ifnum>]	

## Module Information

### Show Module information

#### Commands

#### show product information

<b>Syntax Description</b>	<b>show</b>	Display configuration/status information
	<b>product</b>	Display product information
	<b>information</b>	Display product information
<b>Defaults</b>	N/A	
<b>Command Modes</b>	User EXEC Privileged EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<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>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Event Notification

### Event Notification

#### Show Event Notification Settings

#### Commands

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

<b>Syntax Description</b>	<b>show</b>	Displays running information for the feature
	<b>event-notification</b>	Display event notification settings
	general-event	Show general event notification settings
	poe-event	Show PoE event notification settings
	port-event	Show port event notification settings
	switching-event	Show switching event notification settings
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC /User EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<pre>moxa# show event-notification poe-event PD Power On Event Enable      :Enabled Registered Action :Trap, Email,</pre>	

	<pre> 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 , 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>
<b>Error Messages</b>	N/A
<b>Related Commands</b>	<pre> event-notification general-event event-notification poe-event event-notification port-event event-notification switching-event </pre>

## Configure General Event Notifications

### 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**

<b>Syntax Description</b>	<b>no</b>	Disable the configuration/deletes the entry/reset to default values
	<b>event-notification</b>	Configure event notification settings
	<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 the system certificate 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 the action for event notifications
	<b>trap</b>	Set the trap action for notifications
	<b>email</b>	Set the email action for notifications
	<b>mgmt-relay</b>	Set the MGMT relay action for notifications
	<b>pwr1-relay</b>	Set the PWR1 relay action for notifications
	<b>pwr2-relay</b>	Set the PWR2 relay action for notifications
<b>Defaults</b>	All configuration, trap, email event notifications are enabled by default.	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# config moxa(config)# event-notification general-event all action trap moxa(config)# no event-notification general-event all action trap email	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	show event-notification event-notification poe-event event-notification port-event event-notification switching-event	

## Configure PoE Event Notifications

### 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**

<b>Syntax Description</b>	<b>no</b>	Disable the configuration/delete the entry/reset to default value
	<b>event-notification</b>	Configure event notification settings
	<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 the action for event notifications
	<b>trap</b>	Set the trap action for notifications
	<b>email</b>	Set the email action for notifications
	<b>mgmt-relay</b>	Set the MGMT relay action for notifications
<b>pwr1-relay</b>	Set the PWR1 relay action for notifications	
<b>pwr2-relay</b>	Set the PWR2 relay action for notifications	
<b>Defaults</b>	All configuration, trap, email event notifications are enabled by default.	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# config moxa(config)# event-notification poe-event all action trap moxa(config)# no event-notification poe-event all action trap email	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	show event-notification event-notification general-event event-notification port-event event-notification switching-event	

## Configure Port Event Notifications

### 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**

<b>Syntax Description</b>	<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 the action for event notifications
	<b>trap</b>	Set the trap action for notifications
	<b>email</b>	Set the email action for notifications
	<b>mgmt-relay</b>	Set the MGMT relay action for notifications
	<b>pwr1-relay</b>	Set the PWR1 relay action for notifications
	<b>pwr2-relay</b>	Set the PWR2 relay action for notifications
<b>Defaults</b>	All configuration, trap, email event notifications are enabled by default. Port event notifications are enabled for all ports by default.	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	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	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	show event-notification event-notification general-event event-notification poe-event event-notification switching-event	



## Configure Switching Event Notifications

### Commands

```
event-notification switching-event { all | topology-changed | coupling-changed | master-
changed | master-mismatched | rstp-topology-changed | rstp-root-changed | rstp-migration |
rstp-invalid-bpdu | rstp-new-port-role | redundant-port-health-check-fail | dual-homing-path-
changed | dot1x-auth-fail | lldp-table-changed | rmon-raising-alarm | rmon-falling-alarm }
[action [trap] [email] [mgmt-relay] [pwr1-relay] [pwr2-relay]
```

```
no event-notification switching-event { all | topology-changed | coupling-changed | master-
changed | master-mismatched | rstp-topology-changed | rstp-root-changed | rstp-migration |
rstp-invalid-bpdu | rstp-new-port-role | redundant-port-health-check-fail | dual-homing-path-
changed | dot1x-auth-fail | lldp-table-changed | rmon-raising-alarm | rmon-falling-alarm }
[action [trap] [email] [mgmt-relay] [pwr1-relay] [pwr2-relay]
```

<b>Syntax Description</b>	<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 the action for event notifications
	<b>trap</b>	Set the trap action for notifications
	<b>email</b>	Set the email action for notifications
	<b>mgmt-relay</b>	Set the MGMT relay action for notifications
	<b>pwr1-relay</b>	Set the PWR1 relay action for notifications
	<b>pwr2-relay</b>	Set the PWR2 relay action for notifications
<b>Defaults</b>	All configuration, trap, email event notifications are enabled by default	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<pre>moxa# config moxa(config)# event-notification switching-event all action trap moxa(config)# no event-notification switching -event all action trap email</pre>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	<pre>show event-notification event-notification general-event</pre>	

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**

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

## Email Notification

### Configure Email Notification Server Settings

#### Command

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

<b>Syntax Description</b>	<b>email-notification</b>	Configure email notification parameters
	<b>server</b>	Configure email server parameters
	<b>server-address</b>	Configure the email notification server IP address
	ucast_addr	The email notification server IP address
	server-port	The email notification server IP port
	<b>username</b>	Configure the email notification server username
	string (60)	The email server username
	<b>password</b>	Configure the email notification server password
	string (60)	The email server password
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	(config)# email-notification server-address 1.2.3.4 username aaa password bbb	
<b>Error messages</b>	N/A	
<b>Related commands</b>	N/A	

## Configure the Email Notification Sender

### Commands

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

<b>Syntax Description</b>	<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)
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	(config)# email-notification sender testuser@test.com	
<b>Error messages</b>	Invalid Email Format	
<b>Related commands</b>	N/A	

## Configure the Email Notification Server TLS Mode Setting

### Commands

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

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

## Configure the Email Notification Recipient

### Commands

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

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

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

## Show Email Notification Server Settings

### Commands

**show email-notification server**

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

## Syslog

### Configure Logging Server Settings

#### Commands

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

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

### Delete a Logging Server Entry

#### Commands

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

<b>Syntax Description</b>	<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 logging server
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# no logging-server 1	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	logging-server <short(1-3)> {ipv4 <ucast_addr>   <dns_host_name>} [ port <integer(1-65535)>] show logging syslog-server	

## Enable/Disable the Syslog Server

### Commands

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

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

## Show the Syslog Server Configuration

### Commands

**show logging syslog-server**

<b>Syntax Description</b>	<b>show</b>	Display configuration/status information
	<b>logging</b>	Display logging server information
	<b>syslog-server</b>	Display syslog server information
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC / User EXEC	
<b>Examples</b>	<pre>moxa# show logging syslog-server  Syslog Server Configuration Syslog Enable: disable Index  Server Address  Port  Status  Auth Enable ----- 1      111.2.21.1       514   enable  TLS 2      200.2.2.2        2540  enable  disable 3 Authentication Common name(CN)  Start Time  End Time ----- PKI-123          2020-01-01  2020-12-31</pre>	
<b>Help Message</b>	Display the Syslog logging server table	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	logging server enable logging-server <short(1-3)> {ipv4 <ucast_addr>   <dns_host_name>} [ port <integer(1-65535)>]	

## Copy the Syslog Server Client Certificate and Key

### Commands

**copy syslog-server client-certificate** {<tftp\_url> | <sftp\_url>} **client-key** {<tftp\_url> | <sftp\_url>} **ca-key** {<tftp\_url> | <sftp\_url>}

<b>Syntax Description</b>	<b>copy</b>	Perform the copy operation
	<b>syslog-server</b>	Copy syslog server configurations
	<b>client-certificate</b>	Copy the syslog server client certificate file
	<b>client-key</b>	Copy the syslog server client key file
	<b>ca-key</b>	Copy the syslog server CA key file
	tftp_url	The address of the file on the TFTP server
	sftp_url	The address of the file on the SFTP server
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC / User EXEC	
<b>Examples</b>	moxa# copy syslog-server client-certificate tftp://192.168.127.200/filename1 client-key tftp://192.168.127.200/filename2 ca-key tftp://192.168.127.200/filename3 moxa# copy syslog-server client-certificate sftp://username:password@192.168.127.200/filename1 client-key sftp://username:password@192.168.127.200/filename2 ca-key sftp://username:password@192.168.127.200/filename3	
<b>Error Messages</b>	The certificate and key are not in the same set.	
<b>Related Commands</b>	show logging syslog-server clear syslog-server certificate-and-key	

## Clear the Syslog Server Client Certificate and Key

### Commands

**clear syslog-server certificate-and-key**

<b>Syntax Description</b>	<b>clear</b>	Perform the clear operation
	<b>syslog-server</b>	Clear the syslog server configuration
	<b>certificate-and-key</b>	Clear the syslog authentication certificate and key file
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC	
<b>Examples</b>	moxa# clear syslog-server certificate-and-key	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	show logging syslog-server copy syslog-server client-certificate {<tftp_url>   <sftp_url>} client-key {<tftp_url>   <sftp_url>} ca-key {<tftp_url>   <sftp_url>}	

## Disable Syslog Server TLS Authentication

### Commands

**logging-server** <short(1-3)> **authentication** {disable | tls}

<b>Syntax Description</b>	<b>logging-server</b>	Configure logging server parameters
	short(1-3)	The index of the syslog server
	<b>authentication</b>	Configure the authentication method
	disable	Disable authentication
	tls	Use TLS authentication
<b>Defaults</b>	Disabled	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# logging-server 1 authentication tls moxa(config)# logging-server 2 authentication disable	
<b>Error Messages</b>	The authentication certificate and key do not exist.	
<b>Related Commands</b>	no logging-server <short(1-3)> show logging server	

# Diagnosis

## LLDP

### Show LLDP Information

#### Commands

show lldp

<b>Syntax Description</b>	<b>show</b>	Display configuration/statistics/general information
	<b>lldp</b>	Display LLDP information
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC User EXEC	
<b>Usage Guidelines</b>	Display the global LLDP settings.	
<b>Examples</b>	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	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	config lldp {enable   disable} config lldp chassis-id-subtype { chassis-comp <string(255)>   if-alias   port-comp <string(255)>   mac-addr   nw-addr   if-name   local <string(255)> } config lldp holdtime-multiplier <2-10> config lldp notification-interval <seconds(5-3600)> config lldp reinitialization-delay <seconds(1-10)> config lldp transmit-interval <seconds(5-32768)> config lldp tx-delay (1-8192)	

### Show the LLDP Interface

#### Commands

show lldp interface

<b>Syntax Description</b>	<b>show</b>	Display configuration/statistics/general information
	<b>lldp</b>	Display LLDP information
	<b>interface</b>	Show the LLDP interface information
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC User EXEC	
<b>Usage Guidelines</b>	Display LLDP port interface information.	
<b>Examples</b>	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	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	show lldp config-if > lldp {transmit   receive} config-if > lldp dest-mac <mac_addr>	

## Show LLDP Neighbors

### Commands

**show lldp neighbors** (For RKS v4.0 and prior, MDS v4.0 and prior, EDS v3.2 and prior only)

**show lldp neighbors [management-address | cip ]** (For EDS-(G)4000 v4.0 only)

**show lldp neighbors [management-address | cip | detail]** (For EDS-(G)4000 v4.1 and later only)

<b>Syntax Description</b>	<b>show</b>	Display configuration/statistics/general information
	<b>lldp</b>	Display LLDP information
	<b>neighbors</b>	Display LLDP neighbor information
	<b>management-address</b>	Display the management address configured in the system
	<b>cip</b>	Display CIP-related configuration
	<b>detail</b>	Display all detailed information
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC User EXEC	
<b>Usage Guidelines</b>	Display LLDP neighbor related configuration.	
<b>Examples</b>	<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  Local Intf: Eth2/1   Neighbor Chassis ID      : 00:00:01:00:00:83   Neighbor Port ID        : 00:00:01:00:00:83   Neighbor Port Description : Not Advertised   Neighbor System Name    : Not Advertised   Hold Time                : 3601   Capabilities             :  Total Entries Displayed : 1  moxa# show lldp neighbors detail  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              : 00:00:01:00:00:83 Port Id SubType         : Mac Address Port Id                 : 00:00:01:00:00:83 Port Description        : Not Advertised System Name             : Not Advertised System Desc             : Not Advertised Local Intf              : Eth2/1 Time Remaining          : 3500 Seconds System Capabilities Tlv : Not Advertised Management Address     : Not Advertised  Extended 802.3 TLV Info -MAC PHY Configuration &amp; Status Auto-Neg Support &amp; Status : Supported, Enabled Advertised Capability Bits : 8000 Other -Link Aggregation</pre>	



	<pre> Link Aggregation Tlv      : Not Advertised -Maximum Frame Size Tlv  : Not Advertised  Extended 802.1 TLV Info -Port VLAN Tlv           : Not Advertised -Vlan Name Vlan Name Tlv            : Not Advertised  Total Entries Displayed : 1  moxa# show lldp neighbors management-address  Local  Interface  Management Address Interface ----- Eth1/11  129      192.168.127.250  Total Entries Displayed : 1  moxa# show lldp neighbors cip  Eth1/1 : Extended EtherNet/IP TLV Info - CIP Identification TLV      : Vendor ID                     : 0x03DF Device Type                   : 0x002C Product Code                   : 0x1110 Major Revision                 : 1 Minor Revision                 : 1 Serial Number                  : 1027030  Eth1/2 : Extended EtherNet/IP TLV Info - CIP Identification TLV      : Vendor ID                     : 0x03DF Device Type                   : 0x002C Product Code                   : 0x1110 Major Revision                 : 1 Minor Revision                 : 1 CIP Serial Sumber             : 1027050  Total Entries Displayed : 2 </pre>
<b>Error Messages</b>	N/A
<b>Related Commands</b>	<pre> show lldp config-if &gt; lldp {transmit   receive} config-if &gt; lldp dest-mac &lt;mac_addr&gt; </pre>

## Show LLDP Statistics

### Commands

#### show lldp statistics

<b>Syntax Description</b>	<b>show</b>	Display configuration/statistics/general information
	<b>lldp</b>	Display LLDP information
	<b>statistics</b>	Display LLDP remote table statistics information
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC User EXEC	
<b>Usage Guidelines</b>	Display LLDP statistics for the local counter	
<b>Examples</b>	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
<b>Error Messages</b>	N/A
<b>Related Commands</b>	show lldp

## Show LLDP Error Information

### Commands

show lldp error

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

## Show LLDP Traffic Information

### Commands

show lldp traffic

<b>Syntax Description</b>	<b>show</b>	Display configuration/statistics/general information
	<b>lldp</b>	Display LLDP information
	<b>traffic</b>	Display the LLDP local traffic
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC User EXEC	
<b>Usage Guidelines</b>	Display the local LLDP traffic counter.	
<b>Examples</b>	moxa# show lldp traffic  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	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	show lldp config-if > lldp {transmit   receive} config-if > lldp dest-mac <mac_addr>	



## Enable/Disable LLDP

### Commands

**lldp enable**

**lldp disable**

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

## Configure the Global LLDP Timer Interval

### Commands

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

**no lldp transmit-interval**

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

## Configure the LLDP Hold Time Multiplier

### Commands

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

**no lldp holdtime-multiplier**

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

## Configure the LLDP Transmission Delay

### Commands

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

**no lldp tx-delay**

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

## Configure the LLDP Reinitialization Delay

### Commands

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

**no lldp reinitialization-delay**

<b>Syntax Description</b>	<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 the admin status becomes 'disabled' before reinitialization is attempted
	seconds	The reinitialization delay (1 to 10 seconds)
<b>Defaults</b>	The default reinitialization delay time is 2 seconds.	
<b>Command Modes</b>	Privileged EXEC Global Configuration	
<b>Usage Guidelines</b>	Configure the LLDP reinitialization delay time.	
<b>Examples</b>	moxa(config)# lldp reinitialization-delay 4 moxa(config)# no lldp reinitialization-delay	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	show lldp config lldp enable	

## Configure the LLDP Notification Interval

### Commands

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

**no lldp notification-interval**

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

## Configure LLDP Global Settings

### Commands

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

<b>Syntax Description</b>	<b>lldp</b>	Configure LLDP parameters
	<b>chassis-id-subtype</b>	Configure the chassis-component and local system sybtypes
	chassis-comp	Specify the value of the entPhysicalAlias object of a chassis component as the chassis identifier
	if-alias	Specify the value of ifAlias of an interface on the containing chassis as the chassis identifier
	port-comp	Specify the value of the entPhysicalAlias object of a port or backplane within the chassis as the chassis identifier
	mac-addr	Specify the unicast source MAC address of a port on the chassis as the chassis identifier
	nw-addr	Specify a network address associated with a particular chassis as the chassis identifier. 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	Specify the value of an ifName pbject of an interface on the containing chassis as the chassis identifier
	local	Specify a locally defined value as the chassis identifier
<b>Defaults</b>	The default chassis ID subtype is mac-addr, representing the system's MAC address.	
<b>Command Modes</b>	Privileged EXEC Global Configuration	
<b>Usage Guidelines</b>	Configure the LLDP chassis ID subtype parameters.	
<b>Examples</b>	moxa (config)# lldp chassis-id-subtype chassis-comp moxa	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	show lldp show lldp local config lldp enable	

## Configure LLDP Port Settings

### Commands

**lldp** {transmit | receive}

**no lldp** {transmit | receive}

<b>Syntax Description</b>	<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
<b>Defaults</b>	LLPDU transmission and reception are both enabled by default.	
<b>Command Modes</b>	Privileged EXEC Interface Configuration	
<b>Usage Guidelines</b>	Configure the LLDP TX or RX for the port interface	
<b>Examples</b>	moxa(config-if)# lldp transmit moxa(config-if)# no lldp transmit	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	show lldp show lldp interface	

## Configure the LLDP Port ID Subtype

### Commands

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

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



## Configure LLDP TLV Settings

### Commands

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

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

## Configure LLDP TLV DOT1 Settings

### Commands

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

<b>Syntax Description</b>	<b>lldp</b>	Configure LLDP parameters
	<b>tlv-select</b>	Configure basic LLDP TLV transmission parameters
	<b>dot1tlv</b>	Configure specific IEEE 802.1 TLV parameters
	port-vlan-id	Use the port PVID for the TLV
	vlan-name	Use a VLAN name for the TLV
	<b>Defaults</b>	N/A.
<b>Command Modes</b>	Privileged EXEC Interface Configuration	
<b>Usage Guidelines</b>	Configure LLDP DOT1 TLV parameters.	
<b>Examples</b>	moxa (config-if)# lldp tlv-select dot1tlv port-vlan-id moxa (config-if)# no lldp tlv-select dot1tlv port-vlan-id	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	show lldp local show lldp neighbors show lldp errors	

## Configure LLDP TLV DOT3 Settings

### Commands

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

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

## Port Mirroring

### Enable/Disable Mirroring

#### Commands

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

<b>Syntax Description</b>	<b>port-mirror</b>	Configure port mirror parameters
	enable	Enable mirroring
	disable	Disable mirroring
<b>Defaults</b>	Port mirroring is enabled by default.	
<b>Command Modes</b>	Global Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# configure moxa(config)# port-mirror enable  moxa# configure moxa(config)# port-mirror disable	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Show Mirroring Information

### Commands

**show monitor** { session <session-id (1-7)> | range <session-list> }

<b>Syntax Description</b>	<b>show</b>	Display configuration/status information
	<b>monitor</b>	Display port mirror information
	session	Display the mirroring information of a specific mirroring session
	session-id	Specify the index of the mirroring session
	range	Display the mirroring information for a range of mirroring sessions
	session-list	Specify the mirroring session list
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<pre> moxa-product# show monitor session 1  Mirroring is globally Enabled. Rspan Intermediate is Enabled. Rspan Intermediate Vlan Id : 5.  -----  [SPAN] Session   : 1 Reflect Port Mode Enabled Source Ports   Rx           : None   Tx           : None   Both        : Eth1/1 Reflect Port   : Eth1/2 Session Status : Active  -----  moxa-product# show monitor range 1-7  Mirroring is globally Enabled. Rspan Intermediate Disabled.  -----  [SPAN] Session   : 1 Reflect Port Mode Enabled Source Ports   Rx           : None   Tx           : None   Both        : Eth1/1 Reflect Port   : Eth1/2 Session Status : Active  -----  % Session 2 does not exist % Session 3 does not exist % Session 4 does not exist % Session 5 does not exist  -----  [RSPAN] Session   : 6 Reflect Port Mode Disabled Rspan Type       : Source Rspan Vlan Id    : 3 Source Ports   Rx           : None   Tx           : None   Both        : Eth1/3,po1 Designated Port : Eth1/4 </pre>	

	<pre> Session Status   : Active -----  [RSPAN] Session   : 7 Reflect Port Mode Disabled Rspan Type       : Destination Rspan Vlan Id    : 4 Source Ports   Rx              : None   Tx              : None   Both            : None Destination Port(s) : Eth2/1,Eth2/2 Session Status   : Active ----- </pre>
<b>Error Messages</b>	<pre> % Invalid: Monitor session range must be in between (1-5) Example: Key "range 1-8" % Invalid: Invalid Session List Example: Key "range 0-7" </pre>
<b>Related Commands</b>	N/A

## Configure the Source for a Mirroring Session

### Commands

**monitor session** <session-id (1-7)> { **source** { **interface** { **port-channel** <port-channel-id> | <interface-type> <interface-id> } [{ **rx** | **tx** | **both** ] } }

<b>Syntax Description</b>	<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
	port-channel	Configure the port channel interface
	port-channel-id	Specify the port channel ID, the range is from 1 to (total ports/2)
	interface-type	Specify the interface type
	interface-id	Specify the interface number
	<b>rx, tx, both</b>	Specify the traffic type to mirror: received, transmitted, or both
<b>Defaults</b>	The traffic type to mirror is set to Both by default.	
<b>Command Modes</b>	Global Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<pre>moxa-product# configure moxa-product(config)# monitor session 1 source interface ethernet 1/1  moxa-product# configure moxa-product(config)# monitor session 1 source interface ethernet 1/1 rx  moxa-product# configure moxa-product(config)# monitor session 1 source interface ethernet 1/1 tx  moxa-product# configure moxa-product(config)# monitor session 1 source interface port-channel 1</pre>	
<b>Error Messages</b>	<pre>% Invalid: Duplicated Rx source port. % Invalid: Duplicated Tx source port. % Invalid: The destination port conflicts with the Tx source port or Rx source 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. % Invalid: The RSPAN session cannot be active when the RSPAN Intermediate Role is enabled. % Invalid: The Port-Channel with no member ports cannot be set to the RX source port. % Invalid: The Port-Channel with no member ports cannot be set to the TX source port. % Invalid: When GVRP is enabled, the Reflect Port Mode cannot be enabled or the RSPAN session cannot be active. % Invalid: The source port of the SPAN session with the Reflect Port Mode enabled must be a VLAN access port. % Invalid: The RSPAN destination session cannot configure the Tx source port or Rx source port.</pre>	
<b>Related Commands</b>	<pre>moxa-product(config)# no monitor session &lt;session-id (1-7)&gt; { source { interface { port-channel &lt;port-channel-id&gt;   &lt;interface-type&gt; &lt;interface-id&gt; } }</pre>	

## Remove Source Port Configurations for a Mirroring Session

### Commands

**no monitor session** <session-id (1-7)> {**source { interface** {port-channel <port-channel-id> | <interface-type> <interface-id> }}}

<b>Syntax Description</b>	<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
	port-channel	Configure the port channel interface
	port-channel-id	Specify the port channel ID, the range is from 1 to (total ports/2)
	interface-type	Specify the interface type
	interface-id	Specify the interface number
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa-product# configure moxa-product(config)# no monitor session 1 source interface ethernet 1/1	
	moxa-product# configure moxa-product(config)# no monitor session 1 source interface port-channel 1	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	moxa-product(config)# monitor session <session-id (1-7)> { source { interface { port-channel <port-channel-id>   <interface-type> <interface-id> } [{ rx   tx   both } ] }	

## Configure the Destination for a Mirroring Session

### Commands

**monitor session** <session-id (1-7)> destination {interface <interface-type> <interface-id>} [**reflect-port-mode**]

<b>Syntax Description</b>	<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	Specify the interface type
	interface-id	Specify the interface number
	<b>Reflect-port-mode</b>	Enable Reflect Port Mode
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<pre>moxa# configure moxa(config)# monitor session 1 destination interface ethernet 1/2 reflect-port-mode</pre>	
<b>Error Messages</b>	<p>% Invalid: Duplicated destination port.</p> <p>% Invalid: The destination port conflicts with the 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> <p>% Invalid: If the port is set as the MSTP port, it cannot be set to the destination port.</p> <p>% Invalid: If the port is set as the MRP port, it cannot be set to the destination port.</p> <p>% Invalid: If Dot1x is enabled on this port, it cannot be set to the destination port.</p> <p>% Invalid: The RSPAN destination session cannot be active with the Reflect Port Mode enabled.</p> <p>% Invalid: There is more than one destination port.</p> <p>% Invalid: The source port of the SPAN session with the Reflect Port Mode enabled must be a VLAN access port.</p> <p>% Invalid: The reflect port cannot be configured to the Management VLAN ID.</p> <p>% Invalid: The PVID of the reflect port is in a session that conflicts with the reflect port PVID or the RSPAN VLAN ID of another session, or the RSPAN Intermediate VLAN ID.</p> <p>% Invalid: The RSPAN VLAN ID of an RSPAN session conflicts with the PVID of the reflect port in another session.</p> <p>% Invalid: When GVRP is enabled, the Reflect Port Mode cannot be enabled or the RSPAN session cannot be active.</p> <p>% Invalid: The destination port must be a VLAN access port.</p> <p>% Invalid: The Speed/Duplex settings of the reflect port must be in AUTO mode and enabled.</p> <p>% Invalid: Invalid RSPAN session type</p>	
<b>Related Commands</b>	<pre>moxa-product(config)# no monitor session &lt;session-id (1-7)&gt; destination { interface &lt;interface-type&gt; &lt;interface-id&gt; } [reflect-port-mode]</pre>	

## Delete the Destination Configuration for a Mirroring Session

### Commands

**no monitor session** <session-id (1-7)> destination {interface <interface-type> <interface-id>}[**reflect-port-mode**]

<b>Syntax Description</b>	<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	Specify the interface type
	interface-id	Specify the interface number
	reflect-port-mode	Disable Reflect Port Mode
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# configure moxa(config)# no monitor session 1 destination interface ethernet 1/2 reflect-port-mode	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	moxa(config)# monitor session <session-id (1-7)> destination { interface <interface-type> <interface-id>} [reflect-port-mode]	



## Delete Mirroring Configurations

### Commands

**no monitor session** {range <session-list> | session-id (1-7)}

<b>Syntax Description</b>	<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 mirroring session list
	session-id	The index of the mirroring session
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# configure moxa(config)# no monitor session 1  moxa# configure moxa(config)# no monitor session range 1-7	
<b>Error Messages</b>	% Invalid: Monitor session range must be in between (1-7) Example: Key "range 1-8" % Invalid: Invalid Session List Example: Key "range 0-7"	
<b>Related Commands</b>	N/A	

## Configure the Designated Port for a Mirroring Session

### Commands

**monitor session** <session-id (6-7)> **designated** { interface <interface-type> <interface-id> } [**reflect-port-mode**]

<b>Syntax Description</b>	<b>monitor</b>	Configure port mirroring parameters
	<b>session</b>	Configure the mirroring session
	session-id	The index of the mirroring session
	<b>designated</b>	Configure the designated port parameters
	interface	Configure interface-related configuration
	Interface type	Specify the interface type
	interface-id	Specify the interface ID
	<b>reflect-port-mode</b>	Enable Reflect Port Mode
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa-product# configure moxa-product(config)# monitor session 6 designated interface ethernet 1/2 reflect-port-mode	
<b>Error messages</b>	% Invalid: Duplicated destination port. % Invalid: The destination port conflicts with the Tx source port or Rx source 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. % Invalid: If the port is set as the ring port of Turbo Ring v2, it cannot be set to the destination port.% Invalid: If the port is set as the coupling port of Turbo Ring v2, it cannot be set to the destination port. % Invalid: If the port is set as the Turbo Chain head/tail/member port, it cannot be set to the destination port. % Invalid: If the port is set as the RSTP port, it cannot be set to the destination port.	

	<p>% Invalid: If the port is set as the Dual Homing redundant port, it cannot be set to the destination port.</p> <p>% Invalid: If the port is set as the MSTP port, it cannot be set to the destination port.</p> <p>% Invalid: If the port is set as the MRP port, it cannot be set to the destination port.</p> <p>% Invalid: If Dot1x is enabled on this port, it cannot be set to the destination port.</p> <p>% Invalid: There is more than one destination port.</p> <p>% Invalid: The reflect port cannot be configured to the Management VLAN ID.</p> <p>% Invalid: The PVID of the reflect port must be equal to the RSPAN VLAN ID in an RSPAN source session.</p> <p>% Invalid: The RSPAN VLAN ID of an RSPAN session conflicts with the PVID of the reflect port in another session.</p> <p>% Invalid: When GVRP is enabled, the Reflect Port Mode cannot be enabled or the RSPAN session cannot be active.</p> <p>% Invalid: The destination port must be a VLAN access port.</p> <p>% Invalid: The RSPAN reflect port must be a VLAN trunk port.</p> <p>% Invalid: The Speed/Duplex settings of the reflect port must be in AUTO mode and enabled.</p> <p>% Invalid: Invalid RSPAN session type</p>
<b>Related commands</b>	<pre>moxa-product(config)# no monitor session &lt;session-id (6-7)&gt; designated { interface &lt;interface-type&gt; &lt;interface-id&gt; } [reflect-port-mode]</pre>

## Remove the Designated Port Configurations for a Mirroring Session

### Commands

**no monitor session** <session-id (6-7)> **designated { interface** <interface-type> <interface-id> } **[reflect-port-mode]**

<b>Syntax Description</b>	<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
	<b>designated</b>	Configure the designated port parameters
	<b>interface</b>	Configure interface-related configuration
	interface-type	Specify the interface type
	interface-id	Specify the interface ID
	<b>reflect-port-mode</b>	Disable Reflect Port Mode
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<pre>moxa-product# configure moxa-product(config)# no monitor session 6 designated interface ethernet 1/2 reflect-port-mode</pre>	
<b>Error messages</b>	N/A	
<b>Related commands</b>	<pre>moxa-product(config)# monitor session &lt;session-id (6-7)&gt; designated { interface &lt;interface-type&gt; &lt;interface-id&gt; } [reflect-port-mode]</pre>	

## Configure the RSPAN Session Type and VLAN

### Commands

**monitor session** <session-id (6-7)> **rspan-type** {source | destination} **vlan** <vlan-id (1-4094)>

<b>Syntax Description</b>	<b>monitor</b>	Configure port mirroring parameters
	<b>session</b>	Configure the mirroring session
	session-id	The index of the mirroring session
	<b>rspan-type</b>	Configure RSPAN session type parameters
	<b>source</b>	Enable the RSPAN source session
	<b>destination</b>	Enable the RSPAN destination session

	<b>vlan</b>	Configure RSPAN session VLAN parameters
	vlan-id	Specify the VLAN ID
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<pre>moxa-product# configure moxa-product(config)# monitor session 6 rspan-type source vlan 3  moxa-product# configure moxa-product(config)# monitor session 7 rspan-type destination vlan 2</pre>	
<b>Error messages</b>	<p>% Invalid: The RSPAN VLAN ID cannot be configured to the Management VLAN ID.</p> <p>% Invalid: The RSPAN VLAN ID must be configured to an existing VLAN ID.</p> <p>% Invalid: Duplicated RSPAN VLAN ID.</p> <p>% Invalid: The RSPAN session cannot be active when the RSPAN Intermediate Role is enabled.</p> <p>% Invalid: The RSPAN destination session cannot be active with the Reflect Port Mode enabled.</p> <p>% Invalid: There is more than one RSPAN source session.</p> <p>% Invalid: There is more than one RSPAN destination session.</p> <p>% Invalid: The PVID of the reflect port is in a session that conflicts with the reflect port PVID or the RSPAN VLAN ID of another session, or the RSPAN Intermediate VLAN ID.</p> <p>% Invalid: The RSPAN VLAN ID of an RSPAN session conflicts with the PVID of the reflect port in another session.</p> <p>% Invalid: When GVRP is enabled, the Reflect Port Mode cannot be enabled or the RSPAN session cannot be active.</p> <p>% Invalid: When the RSPAN destination session is active, at least one VLAN trunk port must be enabled.</p>	
<b>Related commands</b>	N/A	

## Configure the RSPAN Intermediate Role

### Commands

**monitor rspan-intermediate-role** {enable | disable} [vlan <vlan-id (1-4094)>]

<b>Syntax Description</b>	<b>monitor</b>	Configure port mirroring parameters
	<b>rspan-intermediate-role</b>	Configure RSPAN intermediate role parameters
	enable	Enable the RSPAN intermediate role
	disable	Disable the RSPAN intermediate role
	vlan	Configure RSPAN session VLAN parameters
	vlan-id	Specify the VLAN ID
<b>Defaults</b>	disable	
<b>Command Modes</b>	Global Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<pre>moxa-product# configure moxa-product(config)# monitor rspan-intermediate-role enable vlan 2  moxa-product# configure moxa-product(config)# monitor rspan-intermediate-role disable</pre>	
<b>Error messages</b>	<p>% Invalid: When GVRP is enabled, the RSPAN Intermediate cannot be enabled.</p> <p>% Invalid: The RSPAN Intermediate VLAN ID cannot be configured to the Management VLAN ID.</p> <p>% Invalid: The RSPAN Intermediate VLAN ID must be configured to an existing VLAN ID.</p> <p>% Invalid: When the RSPAN Intermediate Role is enabled, at least one VLAN trunk port must be active.</p>	

	% Invalid: The PVID of the reflect port is in a session that conflicts with the reflect port PVID or the RSPAN VLAN ID of another session, or the RSPAN Intermediate VLAN ID.
<b>Related commands</b>	N/A

## Ping

### Ping the Host

#### Commands

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

<b>Syntax Description</b>	<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 size 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
<b>request-timeout</b>	The timeout value	
<b>Defaults</b>	N/A	
<b>Command Modes</b>	User EXEC Privileged EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<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>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## ARP Table

### Show IP ARP Table

#### Commands

show ip arp

<b>Syntax Description</b>	<b>show</b>	Display configuration/status information
	<b>ip</b>	Display IP information
	<b>arp</b>	Display the ARP table
<b>Defaults</b>	N/A	
<b>Command Modes</b>	User EXEC Privileged EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# show ip arp	
	IP Address	MAC Address                      Interface
	-----	-----
	192.168.127.95	00:19:cb:d6:db:b4      vlan1
	Total ARP Entries displayed: 1	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

### Clear ARP Cache

#### Commands

clear ip arp

<b>Syntax Description</b>	<b>clear</b>	Clear/flush the dynamically learnt ARP entries
	<b>ip</b>	Clear IP-related information
	<b>arp</b>	Clear ARP cache entries
<b>Defaults</b>	N/A	
<b>Command Modes</b>	User EXEC Privileged EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# clear ip arp	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Event Log

### Show Logging Event Log

#### Commands

##### show logging event-log

<b>Syntax Description</b>	<b>show</b>	Display configuration/status information
	<b>logging</b>	Display logging information
	<b>event-log</b>	Display event log entries
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC / User EXEC	
<b>Examples</b>	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.	
<b>Help Message</b>	Display the log entries information	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	clear logging event-log	

### Show Log Capacity

#### Commands

##### show logging log-capacity

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

### Clear the Event Log

#### Commands

##### clear logging event-log

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

## Export an Event Log File

### Commands

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

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

## Configure Event Log Capacity Settings

### Commands

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

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

## Delete Logging Log Capacity Threshold

### Commands

**no logging log-capacity threshold**

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

## Configure Oversized Log Action Settings

### Commands

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

<b>Syntax Description</b>	<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
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# logging oversized-action { overwrite-oldest   stop-recording }	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Copy the Event Log

### Commands

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

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

## Manufacturing Message Specification (MMS)

### Enable/Disable MMS

#### Commands

**mms** {enable | disable}

<b>Syntax Description</b>	<b>mms</b>	Configure MMS parameters
	<b>enable</b>	Enable MMS
	<b>disable</b>	Disable MMS
<b>Defaults</b>	Enabled	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# mms enable moxa(config)# mms disable	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	



## Configure MMS IED Name

### Commands

**mms ied** <iedname>

<b>Syntax Description</b>	<b>mms</b>	Configure MMS parameters
	<b>ied</b>	Configure the IED name
	<iedname>	Specify the IED name
<b>Defaults</b>	RKS4000	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	This command is to configure MMS IED name.	
<b>Examples</b>	moxa (config)# mms ied test	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Configure MMS RCB Settings

### Commands

**mms rcb** < rcb name > { dchg < **enable** | **disable** > | qchg < **enable** | **disable** > | dupd < **enable** | **disable** > | integrity < **enable** | **disable** > | bufTime <1-4294967295> | intgPd <1-4294967295> }

**mms rcb** {urcbLnkSt | brcbLnkSt | urcbSysSt | brcbSysSt} {{dchg | qchg | dupd | integrity} {**enable** | **disable**} | {bufTime | intgPd} <value (1-4294967295)>}

<b>Syntax Description</b>	<b>mms</b>	Configure MMS parameters
	<b>rcb</b>	Configure RCB parameters
	<b>enable</b>	Enable the specified RCB parameters
	<b>disable</b>	Disable the specified RCB parameters
	<b>urcbLnkSt</b>	Configure the urcbLnkSt table
	<b>brcbLnkSt</b>	Configure the brcbLnkSt table
	<b>urcbSysSt</b>	Configure the urcbSysSt table
	<b>brcbSysSt</b>	Configure the brcbSysSt table
	dchg	Configure the dchg for the specific RCB
	qchg	Configure the qchg for the specific RCB
	dupd	Configure the dupd for the specific RCB
	integrity	Configure the integrity for the specific RCB
	bufTime	Configure the buffer time for the specific RCB
	intgPd	Configure the integrity period for the specific RCB
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	This command is to configure RCB attributes.	
<b>Examples</b>	moxa (config)# mms rcb rcname1 dchg disable	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Export the MMS CID File

### Commands

**mms cid export** { tftp://server/filename | sftp://<user-name>:<pass-word>@server/filename }

<b>Syntax Description</b>	<b>mms</b>	Configure MMS parameters
	<b>cid</b>	Configure the CID file
	<b>export</b>	Export the CID file
	tftp://server/filename	The address of the remote TFTP server and filename in the format "tftp://server/filename"
	sftp://<user-name>:<pass-word>@server/filename	The address, username, and password of the remote TFTP server and filename in the format "tftp://server/filename"
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	This command is to export the CID file of the switch.	
<b>Examples</b>	moxa (config)# mms cid export tftp://192.168.127.50/export_cid	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Enable/Disable MMS T-profile Security

### Commands

**mms t-profile security** { enable | disable }

<b>Syntax Description</b>	<b>mms</b>	Configure MMS parameters
	<b>t-profile</b>	Configure T-profile selection
	<b>security</b>	Configure security setting
	enable	Enable T-profile security
	disable	Disable T-profile security
<b>Defaults</b>	Enabled	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# mms t-profile security enable	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Import/Export the MMS T-Profile CA File

### Commands

**mms t-profile ca import** { tftp://server/filename | sftp://<user-name>:<pass-word>@server/filename }

**mms t-profile ca export** { tftp://server/filename | sftp://<user-name>:<pass-word>@server/filename }

<b>Syntax Description</b>	<b>mms</b>	Configure MMS parameters
	<b>t-profile</b>	Configure T-profile settings
	<b>ca</b>	Configure the CA file
	<b>import</b>	Import the CA file
	<b>export</b>	Export the CA file
	tftp://server/filename	The address of the remote TFTP server and filename in the format "tftp://server/filename"
	sftp://<user-name>:<pass-word>@server/filename	The address, username, and password of the remote TFTP server and filename in the format "tftp://server/filename"
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	This command is to import or export the T-profile CA file of the switch.	
<b>Examples</b>	moxa(config)# mms t-profile ca import tftp://192.168.127.50/tprofile_ca moxa(config)# mms t-profile ca export tftp://192.168.127.50/tprofile_ca	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Import/Export the T-profile Certificate File

### Commands

**mms t-profile certificate import** { tftp://server/filename | sftp://<user-name>:<pass-word>@server/filename }

**mms t-profile certificate export** { tftp://server/filename | sftp://<user-name>:<pass-word>@server/filename }

<b>Syntax Description</b>	<b>mms</b>	Configure MMS parameters
	<b>t-profile</b>	Configure T-profile settings
	<b>certificate</b>	Configure certificate settings
	<b>import</b>	Import the certificate file
	<b>export</b>	Export the certificate
	tftp://server/filename	The address of the remote TFTP server and filename in the format "tftp://server/filename"
	sftp://<user-name>:<pass-word>@server/filename	The address, username, and password of the remote TFTP server and filename in the format "tftp://server/filename"
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	This command is to import or export the T-profile certificate file of the switch.	
<b>Examples</b>	moxa(config)# mms t-profile certificate import tftp://192.168.127.50/tprofile_pfx moxa(config)# mms t-profile certificate export tftp://192.168.127.50/tprofile_pfx	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Enable/Disable MMS A-profile Security

### Commands

**mms a-profile security** { enable | disable }

<b>Syntax Description</b>	<b>mms</b>	Configure MMS parameters
	<b>a-profile</b>	Configure the A-profile selection
	<b>security</b>	Configure security settings
	enable	Enable A-profile security
	disable	Disable A-profile security
<b>Defaults</b>	Enabled	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# mms a-profile security enable	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Import/Export the A-profile Certificate File

### Commands

**mms a-profile certificate import** { tftp://server/filename | sftp://<user-name>:<password>@server/filename }

**mms a-profile certificate export** { tftp://server/filename | sftp://<user-name>:<password>@server/filename }

<b>Syntax Description</b>	<b>mms</b>	Configure MMS parameters
	<b>a-profile</b>	Configure a-profile settings
	<b>certificate</b>	Configure certificate settings
	<b>import</b>	Import the certificate file
	<b>export</b>	Export the certificate file
	tftp://server/filename	The address of the remote TFTP server and filename in the format "tftp://server/filename"
	sftp://<user-name>:<password>@server/filename	The address, username, and password of the remote TFTP server and filename in the format "tftp://server/filename"
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	This command is to import or export the A-profile certificate file of the switch.	
<b>Examples</b>	moxa(config)# mms a-profile certificate import tftp://192.168.127.50/tprofile_pfx moxa(config)# mms a-profile certificate export tftp://192.168.127.50/tprofile_pfx	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Show the MMS Status

### Commands

show mms enable

<b>Syntax Description</b>	<b>show</b>	Display the configuration
	<b>mms</b>	Display MMS settings
	<b>enable</b>	Display the MMS status
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC Mode	
<b>Usage Guidelines</b>	This command shows MMS status information.	
<b>Examples</b>	moxa# show mms enable mms enable	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Show the MMS IED Name

### Commands

show mms iedname

<b>Syntax Description</b>	<b>show</b>	Display the configuration
	<b>mms</b>	Display MMS settings
	<b>iedname</b>	Display the IED name
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC Mode	
<b>Usage Guidelines</b>	This command shows MMS IED information.	
<b>Examples</b>	moxa# show mms iedname IED name: RKS4000	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Show MMS RCB Information

### Commands

show mms rcb

<b>Syntax Description</b>	<b>show</b>	Display the configuration
	<b>mms</b>	Display MMS settings
	<b>rcb</b>	Display RCB information
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC Mode	
<b>Usage Guidelines</b>	This command shows MMS RCB information.	
<b>Examples</b>	<pre> moxa# show mms rcb Report Control Block Table ----- urcbLnkSt  DataChange      = ENABLED QualityChange   = DISABLED DataUpdate      = DISABLED Integrity       = ENABLED BufferTime      = 1000 IntegrityPeriod = 5000 ----- brcbLnkSt  DataChange      = ENABLED QualityChange   = DISABLED DataUpdate      = DISABLED Integrity       = ENABLED BufferTime      = 1000 IntegrityPeriod = 5000 ----- urcbSysSt  DataChange      = ENABLED QualityChange   = DISABLED DataUpdate      = DISABLED Integrity       = ENABLED BufferTime      = 1000 IntegrityPeriod = 5000 ----- brcbSysSt  DataChange      = ENABLED QualityChange   = DISABLED DataUpdate      = DISABLED Integrity       = ENABLED BufferTime      = 1000 IntegrityPeriod = 5000 </pre>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Show the MMS T-profile Status

### Commands

**show mms t-profile enable**

<b>Syntax Description</b>	<b>show</b>	Display the configuration
	<b>mms</b>	Display MMS settings
	<b>t-profile</b>	Display T-profile settings
	<b>enable</b>	Display the T-profile status
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC Mode	
<b>Usage Guidelines</b>	This command is used to check if MMS T-profile is enabled.	
<b>Examples</b>	moxa# show mms t-profile enable mms t-profile enable	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Show the MMS A-profile Status

### Commands

**show mms a-profile enable**

<b>Syntax Description</b>	<b>show</b>	Display the configuration
	<b>mms</b>	Display MMS settings
	<b>a-profile</b>	Display A-profile settings
	<b>enable</b>	Display the A-profile status
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC Mode	
<b>Usage Guidelines</b>	This command is used to check if MMS A-profile is enabled.	
<b>Examples</b>	moxa# show mms a-profile enable mms a-profile enable	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Maintenance and Tools

### Locator

#### Show the Locator

##### Commands

**locator** [ duration ]

<b>Syntax Description</b>	<b>locator</b>	Activate the device locator to force the device LEDs to blink
	duration	The duration of the locator in seconds
<b>Defaults</b>	The locator duration is set to 60 seconds by default.	
<b>Command Modes</b>	Privileged EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# locator 100	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Reboot

### Reboot the Switch

#### Commands

##### reload

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

## Reset to Default

### Reset to Default

#### Commands

##### reload factory default

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

## Log Out

#### Commands

##### exit

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



## Enable or Disable the Tech Support Mechanism

### Commands

**tech-support system** [ enable | disable ]

<b>Syntax Description</b>	<b>tech-support</b>	Configure tech support troubleshooting settings
	<b>system</b>	Configure tech support for the switch system
	Enable	Enable the tech support function
	Disable	Enable the tech support function
<b>Defaults</b>	Disable	
<b>Command Modes</b>	Privileged EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<pre>moxa# tech-support system enable Warning! The Telnet/HTTP service will be disabled. Account Name: moxasupport Account Password: nZParGhefA</pre>	
<b>Error messages</b>	<pre>"% Error! tech-support system hasn't yet been enabled." "% Account: Invalid: Max user account amount reached."</pre>	
<b>Warning messages</b>	<pre>"Warning! The Telnet/HTTP service will be disabled." "Please save config to eliminate the account, moxasupport, from the system."</pre>	
<b>Related commands</b>	tech-support system login	

## Log In to the Tech Support Mechanism

### Commands

**tech-support system login**

<b>Syntax Description</b>	<b>tech-support</b>	Configure tech support troubleshooting settings
	<b>system</b>	Configure tech support for the switch system
	<b>login</b>	Log in to the Linux shell
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<pre>moxa# tech-support system login CLI console locked Enter Password to unlock the console: #</pre>	
<b>Error messages</b>	<pre>"% Error! tech-support system hasn't yet been enabled."</pre>	
<b>Warning messages</b>	N/A	
<b>Related commands</b>	tech-support system enable	

# Industrial Applications

## Modbus TCP

### Enable/Disable Modbus TCP

#### Commands

**modbus-tcp** { enable|disable}

<b>Syntax Description</b>	<b>modbus-tcp</b>	Configure Modbus TCP parameters
	enable	Enable Modbus TCP
	disable	Disable Modbus TCP
<b>Defaults</b>	Disabled	
<b>Command Modes</b>	Global Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# configure moxa(config)# modbus-tcp enable moxa(config)# modbus-tcp disable	
<b>Error messages</b>	N/A	
<b>Warning messages</b>	Are you sure you want to enable a non-secure protocol (Modbus TCP)? [y/N]	
<b>Related commands</b>	show modbus-tcp	

### Show Modbus TCP Information

#### Commands

**Show modbus-tcp**

<b>Syntax Description</b>	<b>show</b>	Display configuration/status information
	<b>modbus-tcp</b>	Display Modbus TCP information
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# show modbus-tcp Modbus TCP Service: Disabled Listening TCP Port: 502 Maximum Session: 5	
<b>Error messages</b>	N/A	
<b>Warning messages</b>	N/A	
<b>Related commands</b>	N/A	

## PROFINET

### Enable/Disable PROFINET

#### Commands

**profinet** {enable | disable}

<b>Syntax Description</b>	<b>profinet</b>	Configure PROFINET parameters
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	enable	Enable PROFINET on the switch
	disable	Disable PROFINET on the switch
<b>Defaults</b>	Disable	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# configure moxa(config)#profinet enable moxa(config)#profinet disable	
<b>Error messages</b>	N/A	
<b>Warning messages</b>	"Are you sure you want to enable a non-secure protocol (PROFINET)? [y/N]"	
<b>Related commands</b>	N/A	

## Configure the PROFINET Device Name

### Commands

**profinet device-name** <profinet-device-name>

<b>Syntax Description</b>	<b>profinet</b>	Configure PROFINET parameters
	<b>device-name</b>	Configure PROFINET device name parameters
	profinet-device-name	Specify the device name in accordance to the PROFINET naming rules defined by IEC 61158-6-10
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# configure moxa(config)#no profinet interface	
<b>Error messages</b>	Invalid: The maximum number of characters for a device name is 240. Invalid: The device name cannot be in IP address format. Invalid: The device name cannot start with "port-" followed by 3 or more digits. Invalid: Each label must be between 1 and 63 characters long. Invalid: Labels cannot start or end with a period (.). Invalid: Labels cannot start or end with a dash (-). Invalid: Only a-z, 0-9 . - are allowed.	
<b>Warning messages</b>	N/A	
<b>Related commands</b>	N/A	

## Reset the PROFINET Device Name

### Commands

**no profinet device-name**

<b>Syntax Description</b>	<b>no</b>	Disable the configuration/delete the entry/reset to default value
	<b>profinet</b>	Configure PROFINET parameters
	<b>device-name</b>	Reset the PROFINET device name
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# configure moxa(config)#no profinet device-name	
<b>Error messages</b>	N/A	
<b>Warning messages</b>	N/A	
<b>Related commands</b>	N/A	

## Show PROFINET Information

### Commands

**show profinet**

<b>Syntax Description</b>	<b>show</b>	Display configuration / statistics / general information
	<b>profinet</b>	Display PROFINET information
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# show profinet PROFINET: Disabled Device Name: Interface Name: vlan1 Link Status: Disconnected	
<b>Error messages</b>	N/A	
<b>Warning messages</b>	N/A	
<b>Related commands</b>	N/A	

## EtherNet/IP

### Enable/Disable EtherNet/IP

#### Commands

**eip** {enable | disable}

<b>Syntax Description</b>	<b>eip</b>	Configure EtherNet/IP parameters
	enable	Enable EtherNet/IP on the switch
	disable	Disable EtherNet/IP on the switch
<b>Defaults</b>	Disable	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# eip enable moxa(config)# eip disable	
<b>Error messages</b>	N/A	
<b>Warning messages</b>	Are you sure you want to enable a non-secure protocol EtherNet/IP? [y/N]	
<b>Related commands</b>	show eip	

## Show EtherNet/IP Information

### Commands

**show eip**

<b>Syntax Description</b>	<b>show</b>	Display configuration / statistics / general information
	<b>eip</b>	Display EtherNet/IP information
<b>Defaults</b>	N/A	
<b>Command Modes</b>	User EXEC Privileged EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# show eip EtherNet/IP Status: Enabled	
<b>Error messages</b>	N/A	
<b>Warning messages</b>	N/A	
<b>Related commands</b>	N/A	

