

# MX-NOS Rail Version V2 Command Line Interface Manual

---

Version 1.5, May 2026

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

**Models covered by this user manual:**

TN-4500B Series

**MOXA**<sup>®</sup>

© 2026 Moxa Inc. All rights reserved.

# **MX-NOS Rail Version V2 Command Line Interface Manual**

The software described in this manual is furnished under a license agreement and may be used only in accordance with the terms of that agreement.

## **Copyright Notice**

© 2026 Moxa Inc. All rights reserved.

## **Trademarks**

The MOXA logo is a registered trademark of Moxa Inc.  
All other trademarks or registered marks in this manual belong to their respective manufacturers.

## **Disclaimer**

- Information in this document is subject to change without notice and does not represent a commitment on the part of Moxa.
- Moxa provides this document as is, without warranty of any kind, either expressed or implied, including, but not limited to, its particular purpose. Moxa reserves the right to make improvements and/or changes to this manual, or to the products and/or the programs described in this manual, at any time.
- Information provided in this manual is intended to be accurate and reliable. However, Moxa assumes no responsibility for its use, or for any infringements on the rights of third parties that may result from its use.
- This product might include unintentional technical or typographical errors. Changes are periodically made to the information herein to correct such errors, and these changes are incorporated into new editions of the publication.

## **Technical Support Contact Information**

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

# Table of Contents

<b>1. About This Manual .....</b>	<b>4</b>
<b>2. Understanding the Command Line Interface .....</b>	<b>5</b>
Accessing the Switch.....	5
Logging in using the RS-232 Console.....	5
Logging in using Telnet .....	8
Command Modes.....	11
Basic Configuration.....	11
Understanding All Command Modes.....	11
Help Messages .....	12
Special Usage and Limitations .....	13
Abbreviated Commands.....	13
No and Default Forms of Commands .....	14
CLI Error Messages .....	15
Command History .....	15
Command Notations.....	15
<b>3. Commands.....</b>	<b>16</b>
System.....	16
System Management .....	16
Account Management.....	30
Management Interface .....	35
Network .....	39
Time .....	70
Provisioning .....	77
Auto Configuration .....	77
Port .....	79
Port Interface .....	79
Link Aggregation .....	89
PoE.....	94
Layer 2 Switching .....	106
VLAN .....	106
MAC .....	124
QoS.....	126
Multicast .....	143
Network Redundancy .....	155
Layer 2 Redundancy .....	155
Management.....	191
Network Management.....	191
Security.....	203
Device Security.....	203
Network Security.....	212
Authentication .....	275
Customer Key Management.....	277
Diagnostics .....	279
System Status .....	279
Event Notification.....	281
Diagnosis .....	293
Manufacturing Message Specification (MMS).....	320
Maintenance and Tools.....	326
<b>4. Supplementary Information .....</b>	<b>330</b>

# 1. About This Manual

---

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

## 2. Understanding the Command Line Interface

---

This chapter helps users understand the command line interface, and demonstrates a general idea 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.

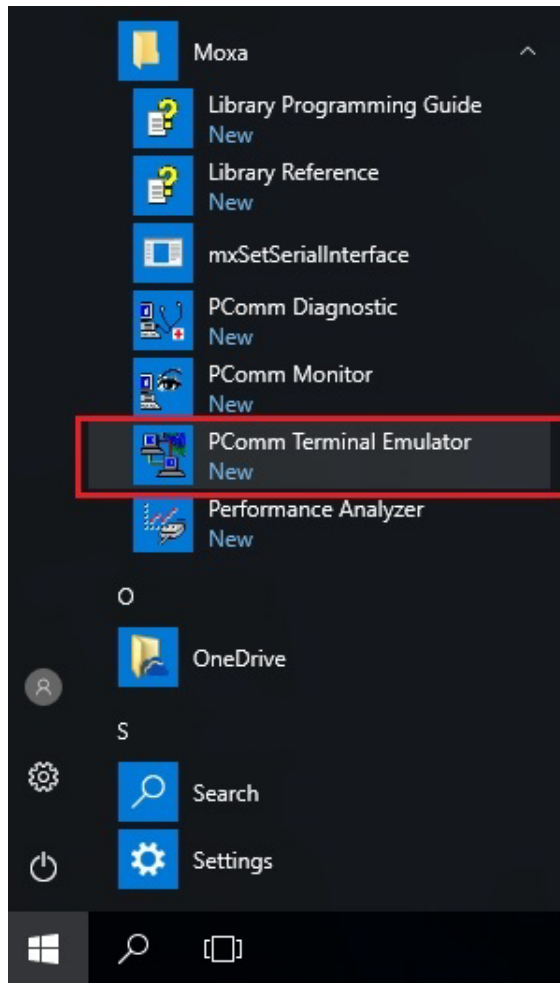


#### NOTE

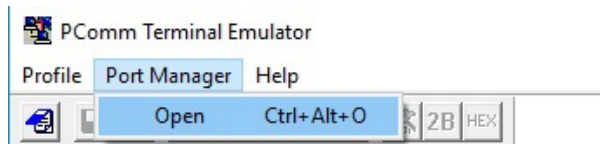
Moxa recommends using PComm Terminal Emulator for serial communication. This software is available for free on the Moxa website. You can use other serial communication software, but the following instructions may be different.

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.

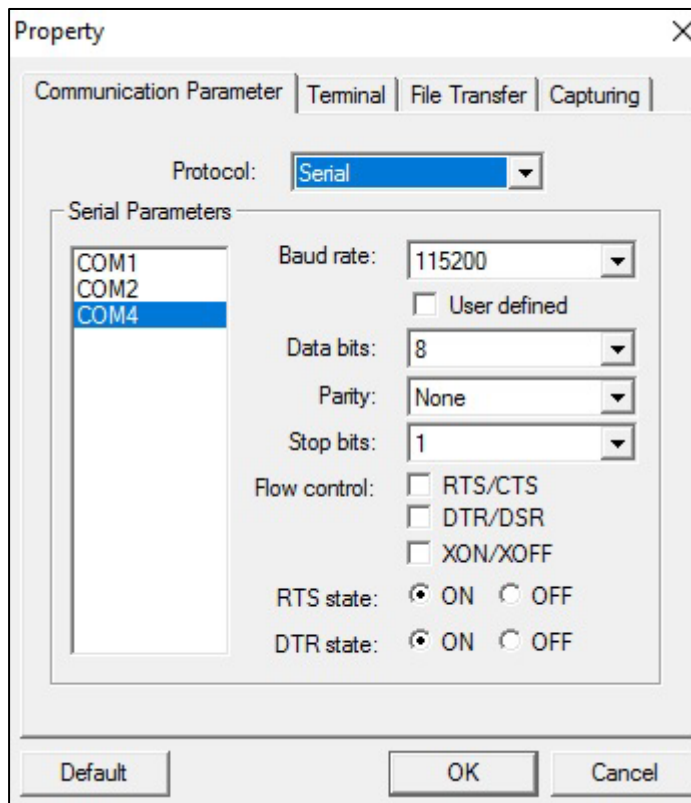
4. In Windows, click **Start > Moxa > PComm Terminal Emulator**.



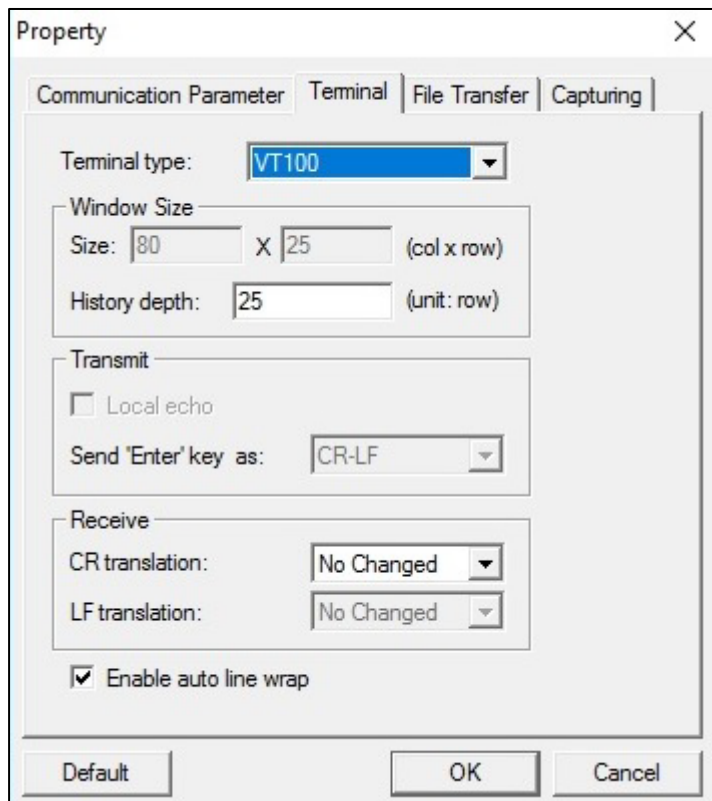
5. Click **Port Manager > Open** to establish a new connection.  
The Property window will appear.



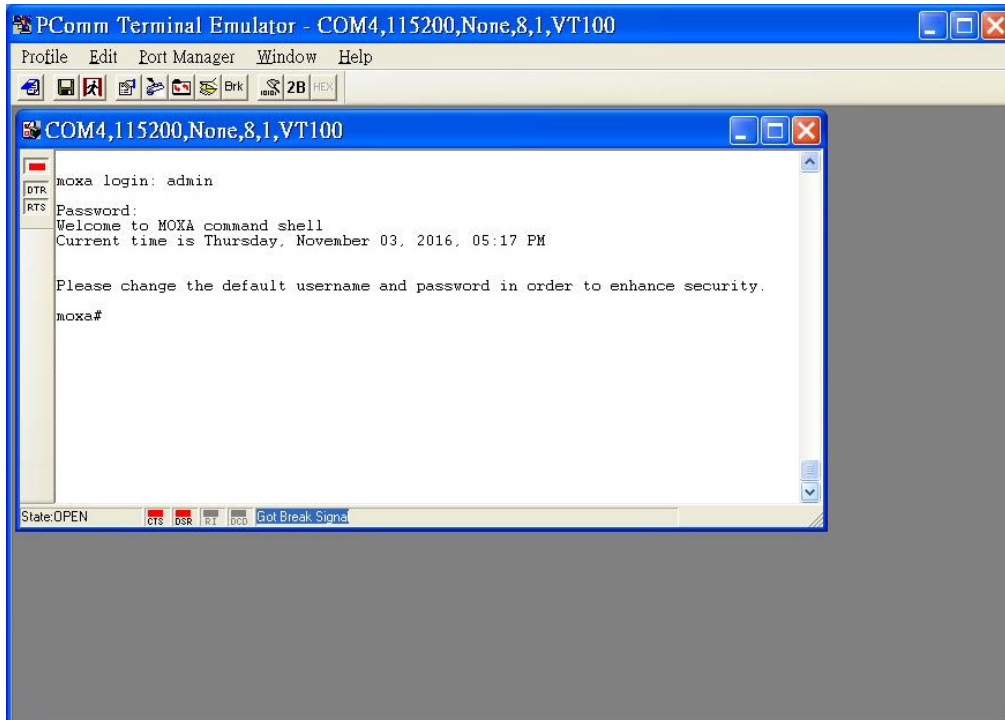
- On the **Communication Parameter** tab, select the COM port that will be used for the console connection. Configure the fields as follows: **115200** for **Baud rate**, **8** for **Data bits**, **None** for **Parity**, and **1** for **Stop bits**.



- 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.

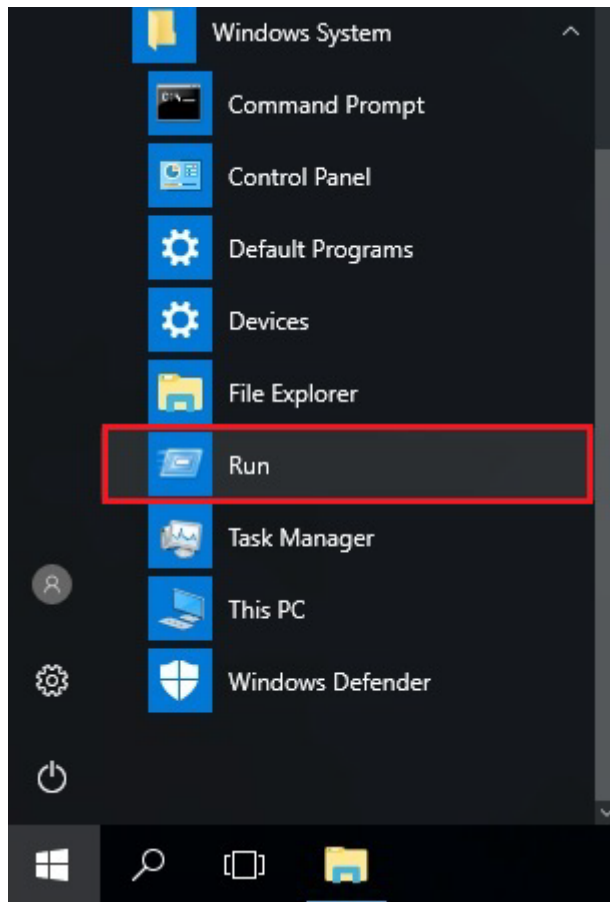


## NOTE

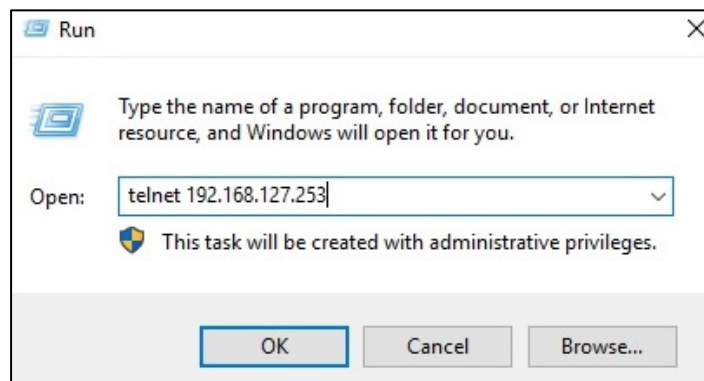
The Moxa switch's default IP address is 192.168.127.253 with subnet mask of 255.255.255.0.

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:

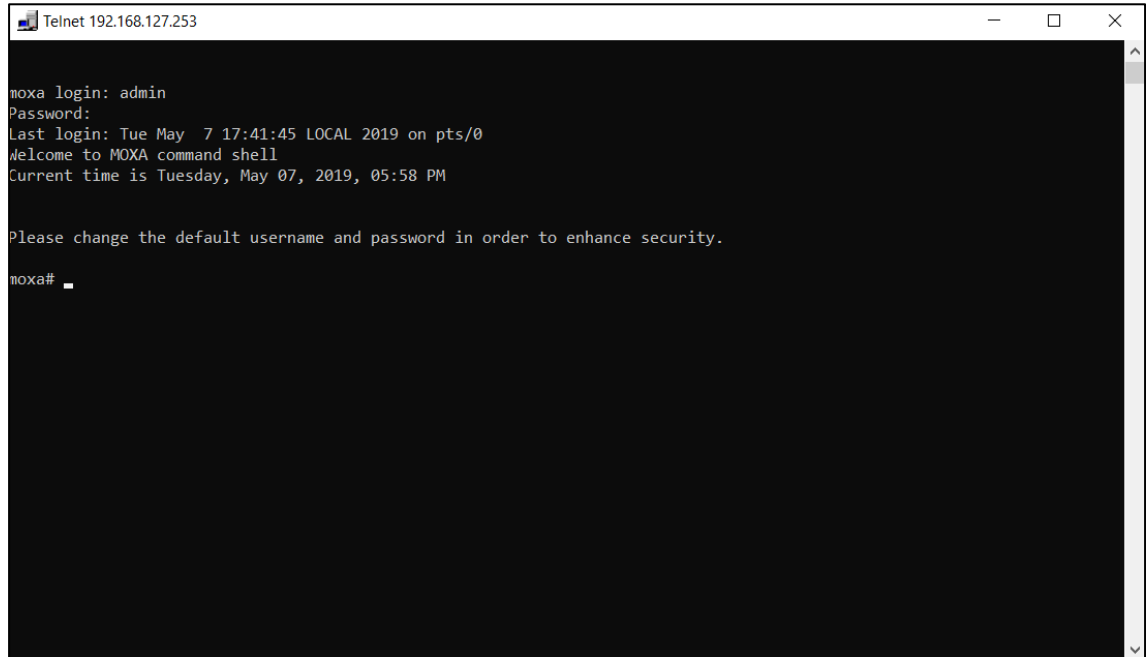
10. In Windows, click **Start > Run**.



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 command <b>interface</b> <interface-type> <interface-id> command.	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> <inter
face-id> }]
cli eth-index-naming { modular | non-modular }
cli pagination turn {on | off}
configure [ terminal ]
copy event-log {tftp://server/filename | sftp://<user-name>:<pass-word>@server
/filename}
copy running-config startup-config
copy running-config {tftp://server/filename | sftp://<user-name>:<pass-word>@s
erver/filename} [included-default] [password <string(60)>]
copy startup-config {tftp://server/filename | sftp://<user-name>:<pass-word>@s
erver/filename} [included-default] [password <string(60)>]
copy { tftp://server/filename running-config | sftp://<user-name>:<pass-word>@
server/filename running-config } [password decrypt-password]
copy { tftp://server/filename | sftp://<user-name>:<pass-word>@server/filename
--More--
```

## No and Default Forms of Commands

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

```
moxa(config)# no ?

contact                Reset the contact information of the device
description            Reset the description of the device
dot1x                  Configure dot1x parameters
event-notification     Configure event notification parameters
hostname               Reset the hostname of the device
interface              Configure interface parameters
ip                     Configure IP parameters
ipv6                   Configure IPv6 parameters
lldp                   Configure LLDP parameters
location               Reset the location information of the device
logging                Configure logging parameters
logging-server         Logging server parameters
login                  Configure login related configuration
mac-address-table     Configure MAC address table parameters
management             Configure management parameters
monitor                Configure Port Mirror parameters
ntp                    Configure NTP/SNTP parameters
poe                    Configure PoE parameters
port-channel           Configure port-channel parameters
radius-server          Configure RADIUS server configuration
--More--
```

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

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

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

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

# CLI Error Messages

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

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

## Command History

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

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

## Command Notations

The following table describes the notation used to indicate command-line syntax in this document.

Notation	Description
<b>Bold text without brackets</b>	Required values that must be typed as provided.
[Text inside square brackets]	Optional values.
{Text inside braces}	Multiple applicable required values. You must choose one.
<Text inside angle brackets>	Placeholder variable that requires the user to specify a valid value.
Vertical bar	Also known as a pipe, a separator for mutually exclusive values. You must choose one.

# 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>	Reset to default value
	<b>hostname</b>	Configure the device hostname parameters
	device-name	Device name which only a-z, A-Z, 0-9 or - are allowed. Max length is 64 characters.
<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>	% Info Setting: Invalid: "Device Name": xxx is invalid input characters	
<b>Related Commands</b>	show system information	

##### 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. Max length is 255 characters.
<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>	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	
<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.
	filename	Specify the filename
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	(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	
<b>Error messages</b>	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	
<b>Related commands</b>	N/A	

## Configuration Backup and Restore

### Copy Running Configuration

#### Commands

Use below privileged command on the device to copy the current running config into a remote server through specific a protocol, an external storage, or into the non-volatile memory (e.g. flash).

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

#### copy running-config startup-config

Use below privileged command on the device to copy a configuration file from a remote server through specific protocol or an external storage and save it as a running config on the device.

**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>included-default</b>	Export the running configuration from the volatile memory
	<b>startup-config</b>	Copy the running configuration to the flash memory as the startup config
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC	
<b>Usage Guidelines</b>	Make sure the network settings are correct before connecting to TFTP or SFTP server. Make sure the hardware interface (USB or Micro SD) is enabled before accessing the external storage.	
<b>Examples</b>	<pre>(moxa)# copy running-config tftp://server/"filename" (moxa)# copy running-config sftp://username:password@server/"filename" (moxa)# copy running-config usb: "filename" (moxa)# copy running-config micro-sd: "filename"  (moxa)# copy tftp://server/"filename" running-config (moxa)# copy sftp://username:password@server/"filename" running-config (moxa)# copy usb: "filename" running-config (moxa)# copy micro-sd: "filename" running-config (config)# copy running-config startup-config</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 startup-config { <tftp_url>   <sftp_url>   usb: <filename>  micro-sd: <filename> } [ <b>included-default</b> ] 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

Use the **copy startup-config** privileged command to copy the system startup config into a remote server through specific protocol or an external storage, or into the flash ROM as the custom default settings.

### Commands

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

### copy startup-config custom-default

<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"
	<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>included-default</b>	Export the startup configuration from the flash memory including the default settings
	<b>custom-default</b>	Save configuration from the flash memory as the custom default configuration
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC	
<b>Usage Guidelines</b>	<p>Make sure the network settings are correct before connecting to TFTP or SFTP server.</p> <p>Make sure the hardware interface (USB or Micro SD) is enabled before accessing the external storage.</p>	
<b>Examples</b>	<pre>(moxa)# copy startup-config tftp://server/"filename" (moxa)# copy startup-config sftp://username:password@server/"filename" (moxa)# copy startup-config usb: "filename" (moxa)# copy startup-config micro-sd: "filename" (moxa)# copy startup-config custom-default</pre>	
<b>Error messages</b>	<p>Invalid: File expects [0-9], [a-z], [A-Z], and -._()</p> <p>Invalid: Not support USB.</p> <p>Invalid: Not support microSD.</p> <p>Invalid: USB function is disable</p> <p>Invalid: MicroSD function is disable</p> <p>Invalid: USB configuration import failed</p> <p>Invalid: MicroSD configuration import failed</p>	
<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; } config-file encryption password &lt;password&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>	

## Configure the Configuration Name

Use the **config-name** command to configure the name of the current configuration.

### Commands

**config-name** <string (32)>

<b>Syntax Description</b>	<b>config-name</b>	Configure the configuration name
	string (32)	Enter the configuration name (32 characters max.)
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	(config)# config-name 123	
<b>Error messages</b>	N/A	
<b>Related commands</b>	show config-name	

## Reset the Configuration Name

Use the **no config-name** command to reset the current configuration name to its default value.

### Commands

**no config-name**

<b>Syntax Description</b>	<b>no</b>	Remove configuration / delete entry / reset to default value
	<b>config-name</b>	Reset the configuration name
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	(config)# no config-name	
<b>Error messages</b>	N/A	
<b>Related commands</b>	show config-name	

## Configure Auto Backup Settings

### Commands

**auto-backup config { enable | disable }**

<b>Syntax Description</b>	<b>auto-backup</b>	Configure auto backup settings to back up files to an external storage
	<b>config</b>	Configure auto back up for configuration files
	<b>enable</b>	Enable auto backup
	<b>disable</b>	Disable auto backup
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	Use the auto-backup config privileged command to set up automatic configuration backups to an external storage such as an ABC-02 or micro-SD whenever the configuration changes.	
<b>Examples</b>	(config)# auto-backup config enable (config)# auto-backup config disable	
<b>Error messages</b>	N/A	
<b>Related commands</b>	show external-storage info auto-backup log	

## Configure Auto Restore Settings

### Commands

**auto-restore config { enable | disable }**

<b>Syntax Description</b>	<b>auto-restore</b>	Configure auto restore settings to restore files from an external storage
	<b>config</b>	Configure auto restore for configuration files
	<b>enable</b>	Enable auto restore
	<b>disable</b>	Disable auto restore
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	Use the auto-restore config privileged command to set auto-restore configuration from the external storages, ABC-02 and micro-SD when boot-up. Use the auto-restore config privileged command to set up automatic configuration restorations from an external storage such as an ABC-02 or microSD when the device boots up.	
<b>Examples</b>	(config)# auto-restore config enable (config)# auto-restore config disable	
<b>Error messages</b>	N/A	
<b>Related commands</b>	show external-storage info	

## Show Configure Name Information

### Commands

**show config-name**

<b>Syntax Description</b>	<b>show</b>	Display running information for the function
	<b>config-name</b>	Show the configuration name
<b>Defaults</b>	N/A	
<b>Command Modes</b>	User EXEC Privileged EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	(config)# show config-name	
<b>Error messages</b>	N/A	
<b>Related commands</b>	config-name	

## Show Auto Backup/Restore Information

### Commands

#### show external-storage info

<b>Syntax Description</b>	<b>show</b>	Display running information for the function
	<b>external-storage</b>	Show information about external storage including USB and microSD
	<b>info</b>	Show the auto-backup configuration, auto-restore configuration, and auto-backup event log settings
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<pre>(moxa)# show external-storage info  External Storage info ----- Auto-backup event log   Enable      : YES Auto-backup configuration   Enable      : YES Auto-restore configuration   Enable      : YES</pre>	
<b>Error messages</b>	N/A	
<b>Related commands</b>	auto-backup log auto-backup config auto-restore config hardware-interface usb enable	

# File Encryption

## Configure File Encryption

Use the **config-file encryption** privileged command to encrypt all data or sensitive information only when exporting a configuration file to an external or remote storage.

### Commands

**config-file encryption entire-file key** < string(60)>

**config-file encryption sensitive-info-only** [ **key** <string(60)>]

**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>entire-file</b>	Encrypt the entire file including sensitive information
	<b>sensitive-info-only</b>	Encrypt sensitive information only
	<b>key</b>	Configure the encryption key string
	string(60)	Specify the encryption key string (60 characters max.)
<b>Defaults</b>	encryption: sensitive-info-only key string: "" (empty string)	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	(config)# config-file encryption sensitive-info-only (config)# config-file encryption sensitive-info-only key 1234 (config)# config-file encryption entire-file key 1234	
<b>Error messages</b>	% Configure File: Invalid: "password": is too long % Configure File: Invalid: Invalid Password Format.	
<b>Related commands</b>	copy running-config { <tftp_url>   <sftp_url>   usb: <filename>   micro-sd: <filename>} [included-default] copy startup-config {<tftp_url>   <sftp_url>   usb: <filename>   micro-sd: <filename>} [included-default] 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}	

## 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>	copy running-config { <tftp_url>   <sftp_url>   usb: <filename>   micro-sd: <filename> } copy startup-config { <tftp_url>   <sftp_url>   usb: <filename>   micro-sd: <filename> } config-file encryption password <password> 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 Signature

## Import Custom Certificate and Key Files

### Commands

**copy customer-key** {<tftp\_url> | <sftp\_url>} **private** {<tftp\_url> | <sftp\_url>} **certificate label** <name>

<b>Syntax Description</b>	<b>copy</b>	Copies the certificate and key files from remote file servers
	<b>customer-key</b>	The key pair generated and imported from the customer
	tftp_url	Specify the file on the remote TFTP server location to be copied. Syntax: <b>tftp://server/filename</b>
	sftp_url	File in remote location to be copied. Syntax: <b>sftp://&lt;user-name&gt;:&lt;pass-word&gt;@ server/filename</b>
	<b>private</b>	The private key
	<b>certificate</b>	The certificate
	<b>label</b>	The key label
	name	Specify the name of imported certificate
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC	
<b>Usage Guidelines</b>	Since only one custom certificate is supported, if you want to replace the existing certificate, use the command <b>clear customer-key</b> to remove the certificate first. <b>copy running-config</b> or <b>copy startup-config</b> will not export the custom certificate.	
<b>Examples</b>	Moxa# copy customer-key tftp://192.168.127.200/custom.crt private tftp://192.168.127.200/customer.key certificate label abckey Moxa# copy customer-key sftp://username:password@192.168.127.200/custom.crt private sftp://username:password@192.168.127.200/customer.key certificate label abckey	
<b>Error messages</b>	The length of the key is not correct. The key algorithm is not correct. The key pair are not in the same set	
<b>Related commands</b>	show customer-key info clear customer-key signed-config {enable   disable}	

## Clear Custom Certificate and Key Files

### Commands

**clear customer-key**

<b>Syntax Description</b>	<b>clear</b>	Clear the key pair
	<b>customer-key</b>	The key pair generated and imported from the customer
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC	
<b>Usage Guidelines</b>	A custom certificate must exist before using this command.	
<b>Examples</b>	Moxa# clear customer-key	
<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> show customer-key info signed-config {enable   disable}	

## Enable/Disable File Signature

### Commands

**signed-config** {enable | disable}

<b>Syntax Description</b>	<b>signed-config</b>	Configure the digital signature when the administrator backs up or restores the configuration
	<b>enable</b>	Enable configuration file signatures
	<b>disable</b>	Disable configuration file signatures
<b>Defaults</b>	Disable	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	A custom certificate must exist before using this command.	
<b>Examples</b>	Moxa(config)# signed-config enable Moxa(config)# signed-config disable	
<b>Error messages</b>	The private and certificate are empty and therefore cannot be enabled.	
<b>Related commands</b>	copy customer-key {<tftp_url>   <sftp_url>} private {<tftp_url>   <sftp_url>} certificate label <name> show customer-key info clear customer-key	

## Show Custom Certificate Information

### Commands

**show customer-key info**

<b>Syntax Description</b>	<b>show</b>	Display custom certificate information
	<b>customer-key</b>	The key pair generated and imported from the customer
	<b>info</b>	Show relevant information
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC	
<b>Usage Guidelines</b>	A custom certificate must exist before using this command.	
<b>Examples</b>	Moxa# show customer-key info Customer key info ----- Private/Certificate Enable: Yes Label: 111 Algorithm: RSA Length: 2048 Moxa#  Moxa# show customer-key info Customer key info ----- Moxa#	
<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}	

## 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
	passwd	The password to be entered by the user
	<b>group</b>	Configures the user privilege level
	{ <b>admin</b>   <b>user</b>   <b>supervisor</b> }	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
	<b>enable</b>	Enable the user
	<b>disable</b>	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>	MOXA(config)# username testuser password test123 group admin status enable email test@test.com MOXA(config)# username testuser password test567 MOXA(config)# username testuser group supervisor MOXA(config)# username testuser status disable MOXA(config)# username testuser email test@test.com.tw MOXA(config)# no username testuser	
<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>	# show user USER            ACTIVE            PRIVILEGE            EMAIL admin            1            admin            admin@sample.com user            1            user            user@sample.com supervisor      1            supervisor      supervisor@sample.com	
<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>	moxa# config moxa(config)# password max-life-time 30 moxa(config)# password max-life-time	
<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
	<b>lowercase</b>	Configure at least 1 lowercase flag for password validation
	<b>uppercase</b>	Configure at least 1 uppercase flag for password validation
	<b>numbers</b>	Configure at least 1 numbers flag for password validation
	<b>symbols</b>	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>	moxa# config moxa(config)# password validate-rules lowercase numbers moxa(config)# password validate-rules	
<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 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 Maximum Lifetime

### Commands

**show password max-life-time**

<b>Syntax Description</b>	<b>show</b>	Display running information for the function
	<b>password</b>	Display password parameters
	<b>max-life-time</b>	Displays the maximum life time of the password before it expires
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# show password max-life-time	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	password max-life-time	

## 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	

# Management Interface

## Hardware Interfaces

### Configure Hardware Interface Settings

#### Commands

**hardware-interface usb {enable | disable}**

<b>Syntax Description</b>	<b>hardware-interface</b>	Configure hardware interfaces
	<b>usb</b>	Configure USB interface settings
	<b>enable</b>	Enable the USB interface
	<b>disable</b>	Disable the USB interface
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	(config)# hardware-interface usb enable (config)# hardware-interface usb disable	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	show hardware-interface	

### Show Hardware Interface Settings

#### Commands

**show hardware-interface**

<b>Syntax Description</b>	<b>show</b>	Display configuration information
	<b>hardware-interface</b>	Display information about the hardware interfaces of the device
<b>Defaults</b>	N/A.	
<b>Command Modes</b>	Privileged EXEC , User EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	Moxa# show hardware-interface DIP Switch: Enabled microSD: Enabled USB: Enabled	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	hardware-interface usb	

## Remote Network Monitoring (RMON)

Remote Monitoring is a standard monitoring specification that enables various network monitors and console systems to exchange network-monitoring data. RMON provides network administrators with more freedom in selecting network-monitoring probes and consoles with features that meet their particular networking needs. An RMON implementation typically operates in a client/server model. Monitoring devices contain RMON software agents that collect information and analyze packets. These monitoring devices act as servers and the Network Management applications that communicate with them act as clients.

The switch supports these RMON groups (defined in RFC 2819):

1. **Statistics** (RMON v1 group 1): Collect the real-time ethernet statistics on the interface.
2. **History** (RMON v1 group 2): Collect the history ethernet statistics on the interface for the specified polling interval.
3. **Alarm** (RMON v1 group 3): Monitor the specific management information base (MIB) object for a specified interval, trigger an alarm when the ethernet statistics exceed defined thresholds. The alarm triggers an event, which can generate a log entry or an SNMP trap.

4. **Event** (RMON v1 group 9): Generate a log or a SNMP trap for Alarm group, when an event is triggered by an alarm.

## Enable/Disable RMON

### Commands

**rmon** { **enable** | **disable** }

<b>Syntax Description</b>	<b>rmon</b>	Configure RMON parameters
	<b>enable</b>	Enable RMON
	<b>disable</b>	Disable RMON
<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)# rmon enable MOXA(config)# rmon disable	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	rmon alarm rmon event show rmon	

## Configure RMON Alarm Settings

### Commands

**rmon alarm** <alarm-id> <mib-object-id> <sample-interval-time> { **absolute** | **delta** } **rising-threshold** <rising-threshold-value> [ <rising-event-number> ] **falling-threshold** <falling-threshold-value> [ <falling-event-number> ] [ **owner** <ownername> ]

**no rmon alarm** <alarm-id>

<b>Syntax Description</b>	<b>rmon</b>	Configure RMON parameters
	<b>alarm</b>	Configure alarm parameters on a MIB object
	alarm-id	Specify the alarm ID
	mib-object-id	Specify the MIB object ID
	sample-interval-time	Specify the sample interval time
	<b>absolute</b>	Configure the MIB variable is directly tested
	<b>delta</b>	Configure the change between samples of a variable is tested
	<b>rising-threshold</b>	Configure the threshold when the alarm is triggered
	rising-threshold-value	Specify the rising threshold value
	rising-event-number	Specify the rising event number
	<b>falling-threshold</b>	Configure the threshold when the alarm is reset
	falling-threshold-value	Specify the falling threshold value
	falling-event-number	Specify the falling event number
	<b>owner</b>	Configure alarm owner parameters
	ownername	Specify the alarm owner name
<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)# rmon event 1 description moxanet owner aricent MOXA(config)# rmon alarm 1 1.3.6.1.2.1.2.2.1.8.1 1 delta rising-threshold 1 falling-threshold 1	
<b>Error Messages</b>	Invalid: The item can not be null, when the entry is valid. Invalid: Alarm variable is not valid. Invalid: Falling-threshold should be less than Rising-threshold. Invalid: The event index should exist in the Event Table.	
<b>Related Commands</b>	rmon event rmon show rmon	

## Configure RMON Event Settings

### Commands

**rmon event** < event-id > **description** < event-description > [ **owner** < ownername > ]

**no rmon event** < event-id >

<b>Syntax Description</b>	<b>rmon</b>	Configure RMON parameters
	<b>event</b>	Configure RMON event parameters
	event-id	Specify the event ID
	<b>description</b>	Configure event description parameters
	event-description	Enter an event description
	<b>owner</b>	Configure event owner parameters
	ownername	Specify the event owner name
<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)# rmon event 1 description moxanet owner aricent	
<b>Error Messages</b>	Invalid: The item can not be null, when the entry is valid.	
<b>Related Commands</b>	rmon alarm rmon show rmon	

## Configure RMON History Settings

### Commands

**rmon collection history** <history-ID> [ **buckets** <bucket-Num> ] [ **interval** <Interval-Time> ] [ **owner** <ownername> ]

**no rmon collection history** <history-ID>

<b>Syntax Description</b>	<b>rmon</b>	Configure RMON parameters
	<b>collection</b>	Configure collection parameters
	<b>history</b>	Configure port-based history collection parameters
	history-ID	Specify the history table index
	<b>buckets</b>	Configure the maximum number of buckets for the RMON collection history group
	bucket-Num	Specify the total number of buckets
	<b>interval</b>	Configure polling cycle interval
	Interval-Time	Specify the polling cycle interval (in sec)
	<b>owner</b>	Configure RMON group owner parameters
	ownername	Specify the RMON group owner name
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Interface Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	MOXA# configure terminal MOXA(config)# interface ethernet 0/1 MOXA(config-if)# rmon collection history 1 bucket 2 interval 20	
<b>Error Messages</b>	Invalid: The item can not be null, when the entry is valid. Invalid: Interface OID is not valid. Invalid: All paramters of the entry is duplicate with the other entry. Invalid: The item can not be set to null, if the interface OID is already exist.	
<b>Related Commands</b>	rmon alarm rmon event rmon show rmon	

## Configure RMON Collection Statistics

### Commands

**rmon collection stats** <stats-ID> [**owner** <ownername>]

**no rmon collection stats** <stats-ID>

<b>Syntax Description</b>	<b>rmon</b>	Configure RMON parameters
	<b>collection</b>	Configure collection parameters
	<b>stats</b>	Configure port-based statistic collection settings
	stats-ID	Specify the statistics table index
	<b>owner</b>	Configure RMON group owner parameters
	ownername	Specify the RMON group owner name
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Interface Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	MOXA# configure terminal MOXA(config)# interface ethernet 0/1 MOXA(config-if)# rmon collection stats 1	
<b>Error Messages</b>	Invalid: The item can not be null, when the entry is valid. Invalid: The interface OID is not valid. Invalid: The interface OID can not be duplicated. Invalid: The item can not be set to null, if the interface OID is already exist.	
<b>Related Commands</b>	rmon alarm rmon event rmon show rmon	

## Show RMON Settings

### Commands

**show rmon** [ **statistics** [ <statistics\_id> ] ] [ **alarms** ] [ **events** ] [ **history** [ <history\_id> ] ] [ **overview** ] ]

<b>Syntax Description</b>	<b>show</b>	Display configuration information
	<b>rmon</b>	Display RMON information
	<b>statistics</b>	Display statistics information
	statistics_id	Specify the statistics index to show information for
	<b>alarms</b>	Display alarm information
	<b>events</b>	Display event information
	<b>history</b>	Display history information
	history_id	Specify the history index to show information for
	<b>overview</b>	Display overview of RMON history entries
<b>Defaults</b>	N/A.	
<b>Command Modes</b>	User EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	MOXA# show rmon MOXA# show rmon statistics MOXA# show rmon alarms MOXA# show rmon events MOXA# show rmon history MOXA# show rmon history overview	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	rmon rmon alarm rmon event rmon collection history	

# Network

## IP Configuration

### Configure IPv4 Management Address

#### Commands

**ip management address** { **dhcp** [**bootfile**] [**client-identifier user-defined** <string (64)>] | <ipv4-address> <ipv4-netmask> [ <ipv4-gateway> ] }

**no ip management address dhcp bootfile**

**no ip management address dhcp client-identifier**

<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
	<b>dhcp</b>	Assign the IPv4 address via DHCP
	<b>bootfile</b>	Configure DHCP bootfile parameter
	<b>client-identifier</b>	Configure DHCP client identifier parameters
	<b>user-defined</b>	Manually specify a client ID value
	string (64)	Specify the user-defined client ID (maximum 64 characters)
	ipv4-address	Specify the IPv4 address
	ipv4-netmask	Specify the IPv4 subnet mask
ipv4-gateway	Specify the IPv4 gateway address	
<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 client-identifier user-defined Moxa123 moxa(config)# ip management address dhcp	
<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	

### Configure IPv4 Management Name Server Settings

#### Commands

**ip management name-server** <server-index> <server-address>

**no ip management name-server** <server-index>

<b>Syntax Description</b>	<b>no</b>	Remove configuration / delete entry / reset to default value
	<b>ip</b>	Configure IP parameters
	<b>management</b>	Configure IPv4 management address parameters
	<b>name-server</b>	Configure the IPv4 DNS address of the device
	server-index	Specify the DNS server index, ranges from 1 to 2
	server-address	Specify the DNS server IPv4 address
<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)# ip management name-server 1 1.1.1.1 moxa(config)# no ip management name-server 1	
<b>Error Messages</b>	Invalid: DNS Server server-address is not reachable.	
<b>Related Commands</b>	N/A	

## Configure IPv6 Management Address

### Commands

**ipv6 management address** <global-unicast-prefix>

<b>Syntax Description</b>	<b>ipv6</b>	Configure IPv6 parameters
	<b>management</b>	Configure IPv6 management address parameters
	<b>address</b>	Configure the IPv6 management address of the device
	global-unicast-prefix	Specify the IPv6 global unicast prefix of device, last 64 bits must be zero
<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)# ipv6 management address 2003:1:1:1::	
<b>Error Messages</b>	Invalid: global-unicast-prefix/64 is not globally reachable.	
<b>Related Commands</b>	N/A	

## Configure IPv6 Management Name Server Setting

### Commands

**ipv6 management name-server** <server-index> <server-address>

**no ipv6 management name-server** <server-index>

<b>Syntax Description</b>	<b>no</b>	Remove configuration / delete entry / reset to default value
	<b>ipv6</b>	Configure IPv6 parameters
	<b>management</b>	Configure IPv6 management address parameters
	<b>name-server</b>	Configure the IPv6 DNS address of the device
	server-index	Index of DNS, ranges from 1 to 2
	server-address	IPv6 address of DNS
<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)# ipv6 management name-server 1 2FFF::1	
	moxa(config)# no ipv6 management name-server 1	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Show IP Management Address

### Commands

**show ip management**

<b>Syntax Description</b>	<b>show</b>	Display configuration/status information
	<b>ip</b>	Display IP-related information
	<b>management</b>	Display management IP 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 ip management	
	IPv4	
	Mode	: Manual
	Address	: 192.168.127.253
	Netmask	: 255.255.255.0

	Gateway : DNS Server IPv6 Global Unicast Address Prefix : Global Unicast Address : Link-Local Address : fe80::201:3ff:fe05:709 DNS Server
<b>Error Messages</b>	N/A
<b>Related Commands</b>	N/A

## Configure global configuration of DHCP bootfile

### Commands

**ip management address** { **profinet-dcp** | **dhcp** [**bootfile** [{**tftp**|**sftp** **username** <username> **password** <password>}]] | **ipv4-address** **ipv4-netmask** [ **ipv4-gateway** ] }

**no ip management address dhcp bootfile**

<b>Syntax Description</b>	<b>no</b>	Remove configuration / delete entry / reset to default value
	<b>ip</b>	Configure IP parameters
	<b>management</b>	Configure IPv4 management address parameters
	<b>address</b>	Configure the IPv4 management address of the device
	<b>profinet-dcp</b>	Assign IPv4 by DCP
	<b>dhcp</b>	Assign IPv4 by DHCP
	<b>bootfile</b>	Configure DHCP bootfile parameter
	<b>tftp</b>	Configure file server mode as TFTP
	<b>sftp</b>	Configure file server mode as SFTP
	<b>username</b>	Configure username parameters
	<b>username</b>	User ID to be used for SFTP
	<b>password</b>	Configure password related parameters
	<b>password</b>	Password to be used for SFTP
	<b>ipv4-address</b>	IPv4 address
	<b>ipv4-netmask</b>	IPv4 netmask
	<b>ipv4-gateway</b>	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>	<pre>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</pre>	
<b>Error Messages</b>	Invalid: Invalid IPv4 Management Address <i>ipv4-address/ipv4-netmask</i> . Invalid: Gateway <i>ipv4-gateway</i> is not reachable. Invalid: Invalid Username Format. Invalid: Invalid Password Format.	
<b>Related Commands</b>	N/A	

## Display global configuration of DHCP bootfile

### Commands

**ip management address** { **profinet-dcp** | **dhcp** [**bootfile** [{**tftp**|**sftp** **username** <username> **password** <password>}]] | **ipv4-address** **ipv4-netmask** [ **ipv4-gateway** ] }

**no ip management address dhcp bootfile**

<b>Syntax Description</b>	<b>no</b>	Remove configuration / delete entry / reset to default value
	<b>ip</b>	Configure IP parameters
	<b>management</b>	Configure IPv4 management address parameters
	<b>address</b>	Configure the IPv4 management address of the device
	<b>profinet-dcp</b>	Assign IPv4 by DCP
	<b>dhcp</b>	Assign IPv4 by DHCP
	<b>bootfile</b>	Configure DHCP bootfile parameter
	<b>tftp</b>	Configure file server mode as TFTP
	<b>sftp</b>	Configure file server mode as SFTP
	<b>username</b>	Configure username parameters
	username	User ID to be used for SFTP
	<b>password</b>	Configure password related parameters
	password	Password to be used for SFTP
	ipv4-address	IPv4 address
ipv4-netmask	IPv4 netmask	
ipv4-gateway	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>	<pre> 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 </pre>	
<b>Error Messages</b>	Invalid: Invalid IPv4 Management Address <i>ipv4-address/ipv4-netmask</i> . Invalid: Gateway <i>ipv4-gateway</i> is not reachable. Invalid: Invalid Username Format. Invalid: Invalid Password Format.	
<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
	<b>binding</b>	Display binding information
	<b>static</b>	Display MAC-based IP assignment information
	<b>port-based-ip-assignment</b>	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>	<pre> moxa# show ip dhcp DHCP Server Mode: DHCP / MAC-based IP Assignment DHCP Pool List ----- Index           : 1 State           : Enable First IP Address : 192.168.127.10 Last IP Address  : 192.168.127.20 Netmask         : 255.255.255.0 Lease Time (secs) : 86400 </pre>	

	<pre> Default Gateway : NTP Server : DNS Server 1 : DNS Server 2 : moxa# show ip dhcp binding Host Name IP Address MAC Address Time Left ----- VirtualBox 192.168.127.10 08:00:27:f6:bf:98 23 h: 59 m: 55 s // A MAC-based IP assignment is created moxa# show ip dhcp static DHCP Server Mode: DHCP / MAC-based IP Assignment MAC-based IP Assignment List ----- Index : 1 State : Enable Host Name : host1 Host IP Address : 192.168.127.30 Host Netmask : 255.255.255.0 MAC Address : 08:00:27:f6:bf:98 Lease Time (secs) : 86400 Default Gateway : NTP Server : DNS Server 1 : DNS Server 2 : 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

## Show IP DHCP Classless Static Route Table

### Commands

**show ip dhcp classless-static-route**

<b>Syntax Description</b>	<b>show</b>	Display configuration/status information
	<b>ip</b>	Display IP-related information
	<b>dhcp</b>	Display DHCP server information
	<b>classless-static-route</b>	Display classless static route 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 ip dhcp classless-static-route  DHCP Server Mode: Port-based IP Assignment Classless Static Route Mode: Port-based IP Assignment Default Gateway: Enable </pre>	

	Classless Static Route Table												
	-----												
	<table border="1"> <thead> <tr> <th>IP Address</th> <th>Subnet Mask</th> <th>Gateway</th> <th>Member Port</th> </tr> </thead> <tbody> <tr> <td>192.168.127.1</td> <td>255.255.255.0</td> <td>192.168.127.254</td> <td>Eth1/1, Eth1/2, po1</td> </tr> <tr> <td>192.168.127.2</td> <td>255.255.255.0</td> <td>192.168.127.254</td> <td>Eth1/3, Eth1/4, po2</td> </tr> </tbody> </table>	IP Address	Subnet Mask	Gateway	Member Port	192.168.127.1	255.255.255.0	192.168.127.254	Eth1/1, Eth1/2, po1	192.168.127.2	255.255.255.0	192.168.127.254	Eth1/3, Eth1/4, po2
IP Address	Subnet Mask	Gateway	Member Port										
192.168.127.1	255.255.255.0	192.168.127.254	Eth1/1, Eth1/2, po1										
192.168.127.2	255.255.255.0	192.168.127.254	Eth1/3, Eth1/4, po2										
	Total displayed: 2												
<b>Error Messages</b>	N/A												
<b>Related Commands</b>	ip dhcp classless-static-route destination ip dhcp classless-static-route mode ip dhcp classless-static-route default-gateway dhcp-server mode												

## Enable DHCP server DHCP and MAC-based IP assignment

### Commands

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

<b>Syntax Description</b>	<b>dhcp-server</b>	Configure DHCP server parameters
	<b>Mode</b>	Configure DHCP server mode parameters
	<b>dhcp-and-mac-based-ip-assignment</b>	Enable DHCP and MAC-based IP assignment mode
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# dhcp-server mode dhcp-and-mac-based-ip-assignment	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Enable DHCP server port-based IP assignment

### Commands

#### 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>port-based-ip-assignment</b>	Enable port-based IP assignment mode
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# dhcp-server mode port-based-ip-assignment	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Disable DHCP server

### Commands

#### dhcp-server mode disable

<b>Syntax Description</b>	<b>dhcp-server</b>	Configure DHCP server parameters
	<b>mode</b>	Configure DHCP server mode parameters
	<b>disable</b>	Disable DHCP server
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# dhcp-server mode disable	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Enable DHCP Port-based IP Assignment Mode for Classless Static Route

### Commands

#### **ip dhcp classless-static-route mode port-based-ip-assignment**

<b>Syntax Description</b>	<b>ip</b>	Configure IP parameters
	<b>dhcp</b>	Configure DHCP-related parameters
	<b>classless-static-route</b>	Configure classless static route parameters
	<b>mode</b>	Configure classless static route mode parameters
	<b>port-based-ip-assignment</b>	Enable port-based IP assignment mode
<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 classless-static-route mode port-based-ip-assignment	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	ip dhcp classless-static-route destination ip dhcp classless-static-route default-gateway dhcp-server mode show ip dhcp classless-static-route	

## Disable DHCP Port-based IP Assignment Mode for Classless Static Route

### Commands

**ip dhcp classless-static-route mode disable**

<b>Syntax Description</b>	<b>ip</b>	Configure IP parameters
	<b>dhcp</b>	Configure DHCP-related parameters
	<b>classless-static-route</b>	Configure classless static route parameters
	<b>mode</b>	Configure classless static route mode parameters
	<b>disable</b>	Disable classless static route
<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 classless-static-route mode disable	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	ip dhcp classless-static-route destination ip dhcp classless-static-route default-gateway dhcp-server mode show ip dhcp classless-static-route	

## Enable/Disable DHCP Classless Static Route (Option 121) Settings

### Commands

**ip dhcp classless-static-route default-gateway { enable | disable }**

<b>Syntax Description</b>	<b>ip</b>	Configure IP parameters
	<b>dhcp</b>	Configure DHCP-related parameters
	<b>classless-static-route</b>	Configure classless static route parameters
	<b>default-gateway</b>	Configure default gateway parameters
	<b>enable</b>	Enable the default gateway
	<b>disable</b>	Disable the default gateway
<b>Defaults</b>	disable	
<b>Command Modes</b>	Privileged EXEC Global Configuration	
<b>Usage Guidelines</b>	The default gateway for classless static routes uses the default gateway address configured in the Port-based IP Assignment configuration section when this feature is enabled. Make sure the default gateway is configured in Port-based IP assignment and also set the Classless Static Route mode to port-based-ip-assignment in advance.	
<b>Examples</b>	moxa(config)# ip dhcp classless-static-route default-gateway enable moxa(config)# ip dhcp classless-static-route default-gateway disable	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	ip dhcp classless-static-route destination ip dhcp classless-static-route mode dhcp-server mode show ip dhcp classless-static-route	

## Configure DHCP Classless Static Route Destination Settings

### Commands

**ip dhcp classless-static-route destination** <ip-address> <subnet-mask> **gateway** <ip-address> **add member** ([<iftype> <iface\_list>][**port-channel** <integer>])

<b>Syntax Description</b>	<b>ip</b>	Configure IP parameters
	<b>dhcp</b>	Configure DHCP-related parameters
	<b>classless-static-route</b>	Configure classless static route parameters
	<b>destination</b>	Configure destination parameters
	ip-address	Specify the unicast IP address
	subnet-mask	Specify the subnet mask
	<b>gateway</b>	Configure gateway parameters
	ip-address	Specify the unicast IP address
	<b>add</b>	Add ports to the classless static route
	<b>member</b>	Configure the interface type and ID of member ports
	iftype	Specify the interface type
	iface_list	Specify the interface list (slot number/port ID or slot number/port ID-port ID)
	<b>port-channel</b>	Configure port channel interface parameters
	integer	Specify the port channel integer
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC Global Configuration	
<b>Usage Guidelines</b>	Make sure port-based-ip-assignment mode is configured for Classless Static Route in advance.	
<b>Examples</b>	<pre>moxa(config)# ip dhcp classless-static-route destination 192.168.127.1 255.255.255.0 gateway 192.168.127.254 add member ethernet 1/1-12,1/13-16 port-channel 1</pre> <pre>moxa(config)# ip dhcp classless-static-route destination 192.168.127.2 255.255.255.0 gateway 192.168.127.254 add member ethernet 1/1-12,1/13-16 port-channel 1</pre>	
<b>Error Messages</b>	<pre>% DHCP Server: Invalid: The given IP Address does not represent a valid IPv4 address. % DHCP Server: Invalid: The given subnet mask does not represent a valid IPv4 classless subnet mask. % DHCP Server: Invalid: This port cannot be configured because it is a member of a port channel. % DHCP Server: Invalid: A port channel must be created first. % All 10 entries are used.</pre>	
<b>Related Commands</b>	<pre>ip dhcp classless-static-route default-gateway ip dhcp classless-static-route mode dhcp-server mode show ip dhcp classless-static-route</pre>	

## Remove DHCP Classless Static Route Destination Setting

### Commands

**no ip dhcp classless-static-route destination** <ip-address> <subnet-mask> [**member** ([[<iftype> <iface\_list>]][**port-channel** <integer>]])]

<b>Syntax Description</b>	<b>ip</b>	Configure IP parameters
	<b>dhcp</b>	Configure DHCP-related parameters
	<b>classless-static-route</b>	Configure classless static route parameters
	<b>destination</b>	Configure destination parameters
	ip-address	Specify the unicast IP address
	subnet-mask	Specify the subnet mask
	<b>member</b>	Configure the interface type and ID of member ports
	iftype	Specify the interface type
	iface_list	Specify the interface list (slot number/port ID or slot number/port ID-port ID)
	<b>port-channel</b>	Configure port channel interface parameters
	integer	Specify the port channel integer
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<pre>moxa(config)# no ip dhcp classless-static-route destination 192.168.127.1 255.255.255.0  moxa(config)# no ip dhcp classless-static-route destination 192.168.127.2 255.255.255.0  moxa(config)# no ip dhcp classless-static-route destination 192.168.127.1 255.255.255.0 member Ethernet 1/1-2 port-channel 1</pre>	
<b>Error Messages</b>	% Destination 192.168.127.1 255.255.255.0 does not exist!	
<b>Related Commands</b>	ip dhcp classless-static-route default-gateway ip dhcp classless-static-route mode dhcp-server mode show ip dhcp classless-static-route	

## 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>	Specify the DHCP pool index
	<b>enable</b>	Enable the DHCP address pool
	<b>disable</b>	Disable the DHCP address pool
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<pre>moxa(config)# ip dhcp pool 1 enable moxa(dhcp-config)#</pre>	
<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>	Specify the DHCP pool index to remove
<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)
	<b>enable</b>	Enable the address pool
	<b>disable</b>	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
	<b>enable</b>	Enable port-based IP assignment
	<b>disable</b>	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 (1-31622340)> } | { default-router
<ucast_addr> } | { dns-server <ucast_addr_p> [ <ucast_addr_s> ] } | { ntp-server <ucast_addr> } |
{ host-name <host-name (63)> } | { domain-name <domain-name (63)> } | { log-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
	<b>lease</b>	Configure duration of lease
	integer (1-31622340)	Number of seconds
	<b>default-router</b>	Configure the default router
	ucast_addr	The unicast IP address
	<b>dns-server</b>	Configure the DNS server
	ucast_addr_p	The primary DNS server IP address
	ucast_addr_s	The secondary DNS server IP address
	<b>ntp-server</b>	Configure the NTP server
	ucast_addr	The unicast IP address
	<b>host-name</b>	Configure client hostname
	host-name (63)	Client hostname
	<b>domain-name</b>	Configure client domain name
domain-name (63)	Client domain name	
<b>log-server</b>	Configure log 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>	<pre>moxa(config-if)# ip dhcp port-based-ip-assignment lease 3600 moxa(config-if)# ip dhcp port-based-ip-assignment default-router 192.168.127.254 moxa(config-if)# ip dhcp port-based-ip-assignment dns-server 192.168.127.254 moxa(config-if)# ip dhcp port-based-ip-assignment dns-server 192.168.127.251 192.168.127.252 moxa(config-if)# ip dhcp port-based-ip-assignment ntp-server 192.168.127.254 moxa(config-if)# ip dhcp port-based-ip-assignment host-name moxa moxa(config-if)# ip dhcp port-based-ip-assignment domain-name moxa.com moxa(config-if)# ip dhcp port-based-ip-assignment log-server 192.168.127.250</pre>	
<b>Error Messages</b>	<pre>Gateway [ucast_addr] is not reachable DNS Server 1 [ucast_addr] is not reachable DNS Server 2 [ucast_addr] is not reachable</pre>	
<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 | host-name | domain-name | log-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
	<b>lease</b>	Configure the IP lease duration
	<b>default-router</b>	Configure the default router
	<b>dns-server</b>	Configure the DNS server
	<b>ntp-server</b>	Configure the NTP server
	<b>host-name</b>	Configure client hostname
	<b>domain-name</b>	Configure client domain name
	<b>log-server</b>	Configure log 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 moxa(config-if)# no ip dhcp port-based-ip-assignment host-name moxa(config-if)# no ip dhcp port-based-ip-assignment domain-name moxa(config-if)# no ip dhcp port-based-ip-assignment log-server	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## DHCP Server Option 66/67

### DHCP Server Option 66/67

#### Commands

```
ip dhcp port-based-ip-assignment { { lease <integer (1-31622340)> } | { default-router <ucast_addr> } | { dns-server <ucast_addr> [ <ucast_addr> ] } | { ntp-server <ucast_addr> } | { host-name <host-name (63)> } | { domain-name <domain-name (63)> } | { log-server <ucast_addr> } | { file-server <ucast_addr> } | { bootfile-name <bootfile (63)> }
```

<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
	<b>lease</b>	Configure duration of lease
	<integer (1-31622340)>	Number of seconds
	<b>default-router</b>	Configure default router
	<ucast_addr>	Unicast IP address
	<b>dns-server</b>	Configure DNS server
	<ucast_addr>	Unicast IP address
	<ucast_addr>	Unicast IP address
	<b>ntp-server</b>	Configure NTP server
	<ucast_addr>	Unicast IP address
	<b>host-name</b>	Configure client hostname
	<host-name (63)>	Client hostname
	<b>domain-name</b>	Configure client domain name
	<domain-name (63)>	Client domain name
	<b>log-server</b>	Configure log server
<ucast_addr>	Unicast IP address	
<b>file-server</b>	Configure file server	
<ucast_addr>	Unicast IP address	
<b>bootfile-name</b>	Configure bootfile name	
<bootfile (63)>	Bootfile name	
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC Interface Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<pre>moxa(config-if)# ip dhcp port-based-ip-assignment lease 3600 moxa(config-if)# ip dhcp port-based-ip-assignment default-router 192.168.127.254 moxa(config-if)# ip dhcp port-based-ip-assignment dns-server 192.168.127.254 moxa(config-if)# ip dhcp port-based-ip-assignment dns-server 192.168.127.251 192.168.127.252 moxa(config-if)# ip dhcp port-based-ip-assignment ntp-server 192.168.127.254 moxa(config-if)# ip dhcp port-based-ip-assignment host-name moxa moxa(config-if)# ip dhcp port-based-ip-assignment domain-name moxa.com moxa(config-if)# ip dhcp port-based-ip-assignment log-server 192.168.127.250 moxa(config-if)# ip dhcp port-based-ip-assignment file-server 192.168.127.250 moxa(config-if)# ip dhcp port-based-ip-assignment bootfile-name moxa</pre>	
<b>Error Messages</b>	<p>Gateway [ucast_addr] is not reachable</p> <p>DNS Server 1 [ucast_addr] is not reachable</p> <p>DNS Server 2 [ucast_addr] is not reachable</p> <p>The host name must start and end with an alphanumeric character and may contain single dots or hyphens, or consecutive hyphens between characters. Consecutive dots and dot-hyphen combinations are not allowed.</p>	
<b>Related Commands</b>	N/A	

## Disabling DHCP Server Option 66/67

### Commands

**no ip dhcp port-based-ip-assignment { lease | default-router | dns-server | ntp-server | host-name | domain-name | log-server | file-server | bootfile-name }**

<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>lease</b>	Configure duration of lease
	<b>default-router</b>	Configure default router
	<b>dns-server</b>	Configure DNS server
	<b>ntp-server</b>	Configure NTP server
	<b>host-name</b>	Configure client hostname
	<b>domain-name</b>	Configure client domain name
	<b>log-server</b>	Configure log server
	<b>file-server</b>	Configure file server
	<b>bootfile-name</b>	Configure bootfile name
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC Interface Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<pre>moxa(config-if)# no ip dhcp port-based-ip-assignment lease moxa(config-if)# no ip dhcp port-based-ip-assignment default-router moxa(config-if)# no ip dhcp port-based-ip-assignment dns-server moxa(config-if)# no ip dhcp port-based-ip-assignment ntp-server moxa(config-if)# no ip dhcp port-based-ip-assignment host-name moxa(config-if)# no ip dhcp port-based-ip-assignment domain-name moxa(config-if)# no ip dhcp port-based-ip-assignment log-server moxa(config-if)# no ip dhcp port-based-ip-assignment file-server moxa(config-if)# no ip dhcp port-based-ip-assignment bootfile-name</pre>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Configure DHCP Port-based IP Assignment

### Commands

**ip dhcp port-based-ip-assignment option-mode { file-server {issued-by-dhcp-server | user-defined} | bootfile-name {ip-addr | user-defined} }**

<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
	<b>option-mode</b>	Configure option mode parameters
	<b>file-server</b>	Configure file server
	<b>issued-by-dhcp-server</b>	use issued by DHCP server
	<b>user-defined</b>	use user defined value
	<b>bootfile-name</b>	Configure bootfile name
	<b>ip-addr</b>	use IP address
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC Interface Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<pre>moxa(config-if)# no ip dhcp port-based-ip-assignment lease moxa(config-if)# no ip dhcp port-based-ip-assignment default-router moxa(config-if)# no ip dhcp port-based-ip-assignment dns-server moxa(config-if)# no ip dhcp port-based-ip-assignment ntp-server moxa(config-if)# no ip dhcp port-based-ip-assignment host-name moxa(config-if)# no ip dhcp port-based-ip-assignment domain-name moxa(config-if)# no ip dhcp port-based-ip-assignment log-server</pre>	
<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>	moxa# clear ip dhcp relay statistics	
<b>Error messages</b>	N/A	
<b>Related commands</b>	N/A	

## 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
	<b>enable</b>	Enable the global DHCP relay
	<b>disable</b>	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 ----- 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	

## 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
	<b>ip</b>	Specify the IP address of the switch
	<b>mac</b>	Specify the MAC address of the switch
	<b>client-id</b>	Specify the hostname of the switch
	<b>other</b>	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	

# DNS Server

## Enable/Disable DNS Server

### Commands

**dns-server** [ { **enable** | **disable** } ]

<b>Syntax Description</b>	<b>dns-server</b>	Configure DNS server parameters
	<b>enable</b>	Enable DNS server functionality
	<b>disable</b>	Disable DNS server functionality
<b>Defaults</b>	Disabled	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa (config)# dns-server enable moxa (config)# dns-server disable	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Enable/Disable DNS Reverse Lookup

### Commands

**ip dns-server reverse-lookup**

**no ip dns-server reverse-lookup**

<b>Syntax Description</b>	<b>ip</b>	Configure IP parameters
	<b>dns-server</b>	Configure DNS server parameters
	<b>reverse-lookup</b>	Enable DNS Reverse Lookup
<b>Defaults</b>	Disabled	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa (config)# ip dns-server reverse-lookup moxa (config)# no ip dns-server reverse-lookup	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Configure DNS Server Zone Settings

### Commands

**ip dns-server zone** <zone-index (1-16)> [**domain-name** <string(63)>]

**no ip dns-server zone** { <zone-index(1-16)> | **all** }

<b>Syntax Description</b>	<b>ip</b>	Configure IP parameters
	<b>dns-server</b>	Configure DNS server parameters
	<b>zone</b>	Configure zone parameters
	zone-index (1-16)	Specify the zone index number
	<b>domain-name</b>	Configure the domain name for the zone
	string(63)	Specify the domain name (maximum 63 characters)
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<pre>moxa(config)# ip dns-server zone 3 % this zone is not created, domain name of this zone should be set first  moxa(config)# ip dns-server zone 3 domain-name xxx moxa(config)# ip dns-server zone 3 moxa(config-dns-server-zone)# moxa(config-dns-server-zone)# end moxa# show ip dns-server zone 3  ZONE-3 ----- Domain name: xxx DNS table: -----  Total entries: 0</pre>	
<b>Error Messages</b>	% this zone is not created, domain name of this zone should be set first	
<b>Related Commands</b>	N/A	

## Show DNS Server Settings

### Commands

**show ip dns-server** [ **zone** [<zone-index>] ]

<b>Syntax Description</b>	<b>show</b>	Display configuration/status information
	<b>ip</b>	Display the IP-related configuration
	<b>dns-server</b>	Show the DNS server configuration
	<b>zone</b>	Display zone information
	zone-index	Specify the zone index to show information for, ranges from 1 to 16
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<pre> moxa# show ip dns-server  DNS Server: Enable DNS Reverse Lookup: Enable  moxa# show ip dns-server zone  Zone Table: ----- Index      Domain Name ZONE-1    a ZONE-2    b ZONE-10   k -----  Total zones: 3  moxa# show ip dns-server zone 1  ZONE-1 Domain name: a  DNS table: ----- FQDN      IP Address 1.door.ext.a  10.1.2.1 2.door.ext.a  10.1.2.2 -----  Total entries: 2 </pre>	
<b>Error messages</b>	N/A	
<b>Related commands</b>	N/A	

# mDNS Responder

## mDNS Responder Global Setting

### Commands

**mdns-sd responder {enable|disable}**

<b>Syntax Description</b>	<b>mdns-sd</b>	Configure mDNS parameters
	<b>responder</b>	Configure mDNS responder parameters
	<b>enable</b>	Enable setting
	<b>disable</b>	Disable setting
<b>Defaults</b>	The feature is enabled by default.	
<b>Command Modes</b>	Privileged EXEC Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# mdns-sd responder enable	
<b>Error Messages</b>	mDNS Responder cannot be disabled if ITxPT service is enabled.	
<b>Warning Messages</b>	If the device hostname contains multiple labels separated by a dot (e.g. [label1].[label2].[...]), only the first label will be used to generate the local domain name (e.g. [label1].local).	
<b>Related Commands</b>	show mdns-sd responder	

## mDNS Responder ITxPT setting

### Commands

**mdns-sd responder itxpt {enable|disable}**

<b>Syntax Description</b>	<b>mdns-sd</b>	Configure mDNS parameters
	<b>responder</b>	Configure mDNS responder parameters
	<b>itxpt</b>	Configure ITxPT service parameters
	enable	Enable setting
	disable	Disable setting
<b>Defaults</b>	The feature is disabled by default.	
<b>Command Modes</b>	Privileged EXEC Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# mdns-sd responder itxpt enable	
<b>Error Messages</b>	ITxPT service cannot be enabled if mDNS Responder is disabled..	
<b>Warning Messages</b>	N/A	
<b>Related Commands</b>	show mdns-sd responder	

## Show mDNS Responder

### Commands

#### show mdns-sd responder

<b>Syntax Description</b>	<b>show</b>	Display configuration/status information
	<b>mdns-sd</b>	Display mDNS information
	<b>responder</b>	Display mDNS responder 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 mdns-sd responder mDNS Responder                : Enabled Local Domain name              : moxa.local System Service Type            : _moxa._tcp System Service Instance Name : TN-4520B-12P-4G-4GP- T_B12B01._moxa._tcp.local  ITxPT Service                  : Enabled ITxPT Service Type            : _itxpt_socket._tcp ITxPT Service Instance Name : MOXA00000000_inventory._itxpt_socket._tcp.local</pre>	
<b>Error Messages</b>	N/A	
<b>Warning 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
-------------------------	-----

## 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
	<b>local</b>	Use the local clock
	<b>ntp</b>	Use Network Time Protocol (NTP)
	<b>sntp</b>	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 (2000 to 2037)
<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 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 2nd 3rd 4th 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 auth-key** key-id {**md5** | **aes128cmac**} key-string  
**no ntp auth-key** key-id

<b>Syntax</b>	<b>no</b>	Remove configuration / delete entry / reset to default value
<b>Description</b>	<b>ntp</b>	Configure NTP/SNTP parameters
	<b>auth-key</b>	Configure the authenticate key of NTP
	key-id	Key number, range from 1 to 65535
	<b>md5</b>	Use MD5 authentication
	<b>aes128cmac</b>	Use AES128CMAC authentication
	key-string	Authentication key, maximum key length is 20 bytes (20 chars in ASCII) or 32 bytes (hex string).
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<pre>moxa# configure terminal moxa(config)# ntp auth-key 1 md5 1a2b3c4d moxa(config)# ntp auth-key 1 aes128cmac 1a2b3c4d moxa(config)# no ntp auth-key 1</pre>	
<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
	<b>authentication</b>	Configure NTP authentication parameters
	<b>key</b>	Use key authentication
	key-id	The ID of the authentication key. Ranges from 1 to 65535.
<b>Defaults</b>	NTP time server: time.nist.gov	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<pre>moxa# configure terminal moxa(config)# ntp remote-server ntp 1 1.1.1.1 moxa(config)# ntp remote-server ntp 2 2.2.2.2 authentication key 1 moxa(config)# no ntp remote-server ntp 2 authentication moxa(config)# no ntp remote-server ntp 1</pre>	
<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>

<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	

## Configure SNTP Query Interval

### Commands

**sntp query-interval** <integer(4-13)>

<b>Syntax Description</b>	<b>sntp</b>	Configure SNTP parameters
	<b>query-interval</b>	Configure SNTP query interval parameters
	Integer(4-13)	Specify the SNTP query interval value: 4 (16 sec), 5 (32 sec), 6 (64 sec), 7 (128 sec), 8 (256 sec), 9 (512 sec), 10 (1024 sec), 11 (2048 sec), 12 (4096 sec), 13 (8192 sec)
<b>Defaults</b>	SNTP query interval: 9(512 sec.)	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# configure terminal moxa(config)# sntp query-interval 8	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Configure SNTP Query Interval to Default Value

### Commands

**no sntp query-interval**

<b>Syntax Description</b>	<b>no</b>	Reset SNTP query interval to its default value
	<b>sntp</b>	Configure SNTP parameters
	<b>query-interval</b>	Reset the SNTP query interval parameters
<b>Defaults</b>	SNTP query interval: 9(512 sec.)	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# configure terminal moxa(config)# no sntp query-interval	
<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	

# Provisioning

## Auto Configuration

### Auto Configuration

#### Configure Auto Configuration Settings

##### Commands

**auto-configuration** {**mode** {**disable** | **import** | **propagate**} | **timeout** <seconds> | **control-unit-port** <interface-type> <interface-id>}

**no auto-configuration**

<b>Syntax Description</b>	<b>no</b>	Remove configuration / delete entry / reset to default value
	<b>auto-configuration</b>	Configure Auto Configuration parameters
	<b>mode</b>	Configure the Auto Configuration mode
	<b>disable</b>	Disable Auto Configuration
	<b>import</b>	Set Auto Configuration to Import Mode
	<b>propagate</b>	Set Auto Configuration to Propagate Mode
	<b>timeout</b>	Configure the timeout value
	seconds	Specify the timeout value (in seconds)
	<b>control-unit-port</b>	Configure control unit port parameters
	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>	This feature is disabled by default.	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# auto-configuration mode import moxa(config)# auto-configuration timeout 360 moxa(config)# auto-configuration control-unit-port ethernet 1/6	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	show auto-configuration	

## Show Auto Configuration Settings

### Commands

**show auto-configuration**

<b>Syntax Description</b>	<b>show</b>	Show configuration/status information
	<b>auto-configuration</b>	Display Auto Configuration 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 auto-configuration	
	Mode: Import	
	Timeout(seconds): 360	
	Control Unit Port: 4	
	Status: Auto Configuration will be triggered after the reboot	
	DHCP Server:	
	File Server: File Name:	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	auto-configuration	

# Port

## Port Interface

### Port Settings

#### 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>] [{ **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
	<b>description</b>	Description about the interface
	<b>storm-control</b>	Broadcast, multicast, and unicast storm control suppression levels for an interface
	<b>flowcontrol</b>	Receive or send flow control value for an interface
<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>	<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   Bad CRC         : 0   Error Drops     : 0</pre>	

	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> | <interface-type> <interface-id> } ] ]

<b>Syntax Description</b>	<b>show</b>	Display configuration/statistics/general information
	<b>flow-control</b>	Display flow-control information
	<b>interface</b>	Protocol-specific configuration of the interface
	<b>port-channel</b>	Display the port-channel interface
	port-channel-id	Display channel group information
	interface-type	<b>ethernet</b>
	interface-id	The interface ID: slot number/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	
	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	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Show Linkup Delay Status

### Commands

**show linkup-delay** [ **interface** <interface-type> <interface-id> ]

<b>Syntax Description</b>	<b>show</b>	Display configuration/statistics/general
	<b>linkup-delay</b>	Display linkup-delay information
	<b>interface</b>	Interface-related configuration
	interface-type	<b>ethernet</b>
	interface-id	The interface ID: slot number/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
	<b>full</b>	Set the port to full-duplex mode
	<b>half</b>	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
	<b>on</b>	Enable flow control
	<b>off</b>	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
	<b>auto</b>	Set the port as an auto-crossover port
	<b>mdi</b>	Set the port as an MDI port
	<b>mdix</b>	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
	<b>enable</b>	Enable linkup-delay in the system
	<b>disable</b>	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)>

**no linkup-delay timer**

<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</b>	linkup-delay [ enable   disable ]	
<b>Commands</b>	linkup-delay	

## Configure Linkup Delay Settings

### Commands

**linkup-delay**

**no linkup-delay**

<b>Syntax Description</b>	<b>linkup-delay</b>	Enable linkup delay on this interface
	<b>no linkup-delay</b>	Disable linkup delay on this interface
<b>Defaults</b>	Linkup delay is disabled by default	
<b>Command Modes</b>	Interface Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config-if)# linkup-delay moxa(config-if)# no linkup-delay	
<b>Error Messages</b>	N/A	
<b>Related</b>	linkup-delay [ enable   disable ]	
<b>Commands</b>	linkup-delay timer	

## Configure Auto-Negotiation Settings

### 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</b>	speed { 10   100 }	
<b>Commands</b>	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. This is an integer value and it is recommended to configure it incrementally.
<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
	<b>src-mac</b>	Load distribution is based on the source MAC address
	<b>dest-mac</b>	Load distribution is based on the destination MAC address
	<b>src-dest-mac</b>	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>	<pre>moxa# configure terminal moxa(config)# interface port-channel 10 moxa(config-if)# no shutdown moxa(config-if)# exit moxa(config-if)# port-channel load-balance src-mac 10 moxa(config-if)# no port-channel load-balance src-mac 10</pre>	
<b>Error Messages</b>	<pre>'Invalid: Link Aggregation/Port-Channel group is out of range.'</pre> <pre>'Invalid: Port channel should be activated before setting the selection policy configuration.'</pre> <pre>'Invalid: The port-channel does not exist.'</pre>	
<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
	<b>on</b>	Configure the interface to use static trunk channel without LACP
	<b>active</b>	Configure LACP negotiation to start unconditionally
	<b>passive</b>	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>	A port-channel should be created before specifying it in the command.	
<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
	<b>long</b>	Configure the longest timeout of 90 seconds
	<b>short</b>	Configure the shortest timeout of 3 seconds
<b>Defaults</b>	LACP timeout is set to long be 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** [<channel-group-number>] [{ **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
	channel-group-number	Display channel group information
	<b>detail</b>	Display detailed information
	<b>load-balance</b>	Display load-balance scheme among ports in the port-channel
	<b>port</b>	Display port-channel port information
	<b>port-channel</b>	Display port-channel information
	<b>summary</b>	Display summary per channel group
<b>protocol</b>	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
	<b>enable</b>	Enable PoE on the switch
	<b>disable</b>	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: no-action</b> 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(0-23)> <start-time-min: integer(0-59)> <end-time-hour: integer(0-23)> <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 (0-23)	The scheduling rule starting hour
	start-time-min: integer (0-59)	The scheduling rule starting minute
<b>Defaults</b>	end-time-hour: integer (0-23)	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)>]	

## Configure Scheduling Rule Setting

### Commands

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

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

<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>activate</b>	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)# po e scheduling <rule-name: string (63)> activate moxa(config)# no po e scheduling <rule-name: string (63)> activate	
<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 Repeat Setting

### Commands

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

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

<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>repeat</b>	Repeat PoE scheduling rules
	<b>daily</b>	Repeat daily
	<b>weekday</b>	Repeat on weekdays
	<b>weekend</b>	Repeat on weekends
	<b>sunday</b>	Repeat every Sunday
	<b>monday</b>	Repeat every Monday
	<b>tuesday</b>	Repeat every Tuesday
	<b>wednesday</b>	Repeat every Wednesday
	<b>thursday</b>	Repeat every Thursday
	<b>friday</b>	Repeat every Friday
	<b>saturday</b>	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 po e 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)# po e scheduling bt01 repeat daily moxa(config)# no po e scheduling bt01 repeat daily	

## Configure Port Power Output Setting

### Commands

**po e**  
**no po e**

<b>Syntax Description</b>	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>po e</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)# po e moxa(config-if)# no po e	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	show po e [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

**po e legacy-pd-detection**  
**no po e legacy-pd-detection**

<b>Syntax Description</b>	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>po e</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)# po e legacy-pd-detection moxa(config-if)# no po e legacy-pd-detection	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	show po e [interface <iftype> <ifnum>] {config   status   diagnosis}	

## Configure Port Auto Power Cutting Priority Setting

### Commands

**po e priority { critical | high | low }**  
**no po e priority**

<b>Syntax Description</b>	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>po e</b>	Configure PoE parameters
	<b>priority</b>	The priority for automatically PoE cutting power
	<b>critical</b>	Critical priority
	<b>high</b>	High priority
	<b>low</b>	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)# po e priority critical moxa(config-if)# no po e priority	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	show po e [interface <iftype> <ifnum>] {config   status   diagnosis} po e auto-power-cutting no po e 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>	For bt PoE (RKS/EDS Series):																																																						
	<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>																																																						
<b>Usage Guidelines</b>	For PoE (MDS Series):																																																						
	<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</pre>																																																						
	<pre>moxa# show poe status Power Budget Limit: 180 Allocated Power: 46 Consumed Power: 1 Remaining Available Power: 134</pre> <table border="1"> <thead> <tr> <th>Port</th> <th>Power Output</th> <th>Classification</th> <th>Current</th> <th>Voltage</th> <th>Consumption</th> </tr> </thead> <tbody> <tr> <td>Eth1/1</td> <td>Off</td> <td>Unknown</td> <td>0.00</td> <td>0.00</td> <td>0.00</td> </tr> <tr> <td>Eth1/2</td> <td>Off</td> <td>Unknown</td> <td>0.00</td> <td>0.00</td> <td>0.00</td> </tr> <tr> <td>Eth1/3</td> <td>Off</td> <td>Unknown</td> <td>0.00</td> <td>0.00</td> <td>0.00</td> </tr> <tr> <td>Eth1/4</td> <td>Off</td> <td>Unknown</td> <td>0.00</td> <td>0.00</td> <td>0.00</td> </tr> <tr> <td>Eth1/5</td> <td>Off</td> <td>0</td> <td>0.00</td> <td>0.00</td> <td>0.00</td> </tr> <tr> <td>Eth1/6</td> <td>Off</td> <td>0</td> <td>0.00</td> <td>0.00</td> <td>0.00</td> </tr> <tr> <td>Eth1/7</td> <td>Off</td> <td>0</td> <td>0.00</td> <td>0.00</td> <td>0.00</td> </tr> <tr> <td>Eth1/8</td> <td>On</td> <td>3,4</td> <td>14.65</td> <td>48.59</td> <td>0.71</td> </tr> </tbody> </table>		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
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																																																		
<b>Error Messages</b>	N/A																																																						
<b>Related Commands</b>	poe {enable   disable}																																																						
	poe system-power-budget <watt: integer (30-Maximum value of actual power budget*)>																																																						

	<pre> 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
	<b>interface</b>	Interface information
	iftype	The interface type
	ifnum	The interface number
	<b>config</b>	The current PoE configuration applied to the port
	<b>status</b>	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

### Commands

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

<b>Syntax Description</b>	<b>po</b> e	Configure PoE parameters
	<b>power-management-mode</b>	Power management mode depends on power usage of all ports
	<b>allocated-power</b>	Calculate power budget of all ports
	<b>consumed-power</b>	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)# poe 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)# poe 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
	<b>brief</b>	Display the VLAN entry related information of all active VLANs and VLANs (that are not active) for which the port details are configured.
	<b>id</b>	The VLAN index
	vlan-range	The VLAN index range (ex: 1-10 means the VID 1 to VID 10)
	<b>summary</b>	Display the total number of VLANs
	<b>ascending</b>	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-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
	<b>port-channel</b>	The port channel
	integer	Integer value, should be valid port-channel ID
	interface-type	<b>ethernet</b>
	interface-id	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>	<pre> Switchport pvid Switchport acceptable-frame-type Switchport ingress-filter Switchport mode gvrp gmrp vlan restricted group restricted switchport filtering-utility-criteria </pre>	

## Show MAC Address Table Information

### Commands

**show mac-address-table** [**vlan** <vlan-range>] [**address** <aa:aa:aa:aa:aa:aa>] [**interface** {**port-channel** <integer> | <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																				
	<b>vlan</b>	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.																				
	vlan-id	Integer value ranges from 1 to 4094.																				
	<b>interface</b>	Configure the interface																				
	interface-type	<b>ethernet</b>																				
	interface-id	The interface ID: slot number/port number																				
<b>port-channel</b>	The port channel																					
integer	Integer value, should be valid port-channel ID																					
<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																					

## 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 ----  -</pre> <pre>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</pre> <pre>iss# show mac-address-table dynamic multicast  vlan  Mac Address      Type  ConnectionId  Ports ----  -</pre> <pre>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	The Ethernet type 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 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
	<b>port</b>	Display port information
	<b>port-channel</b>	The port channel
	integer	Integer value, should be valid port-channel ID
	interface-type	<b>ethernet</b>
	interface-id	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 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 GMRP Statistics

### Commands

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

<b>Syntax Description</b>	<b>show</b>	Display configuration/statistics/general information
	<b>gmrp statistics</b>	Display GMRP statistics
	<b>port</b>	Display port information
	<b>port-channel</b>	Configure port channel parameters
	integer	Specify the integer value, must be valid port-channel ID
	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 gmrp statistics port ethernet 1/5 GMRP Statistics for Port Eth1/5 ----- 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:0 Join Emptys      0 Join In          0 Leave In          0 Leave All         0 Leave Empty       0 Empty            0</pre>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## 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>	<pre>moxa# show management vlan  Management VLAN-List 1,2,  ....</pre>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	Management vlan No management vlan	

## Show VLAN Unaware Mode

The command displays the current configuration of VLAN Unaware mode.

### Commands

#### show vlan-unaware

<b>Syntax Description</b>	<b>show</b>	Display configuration/statistics/general information
	<b>vlan-unaware</b>	Display VLAN Unaware mode 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-unaware Vlan Unaware: Disabled	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## 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 <code>vlan &lt;vlan-id&gt;</code> 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>	<pre>vlan active switchport mode show vlan show mac-address-table count</pre>	

## Globally Enable/Disable GVRP on All Ports

### Commands

**gvrp** {enable | disable}

<b>Syntax Description</b>	<b>gvrp</b>	Configure GVRP parameters
	<b>enable</b>	Enable on all ports and start the GVRP on the switch
	<b>disable</b>	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>	<pre>moxa(config)# gvrp enable</pre>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	<pre>bridge-mode show vlan device info show gvrp statistics</pre>	

## 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>	Interface 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	

## Globally Enable/Disable VLAN Unaware Mode

This command enables or disables VLAN Unaware mode. When enabled, the device operates in a VLAN-segmented LAN by processing packets according to inbound rules. It forwards data packets transparently without modification, effectively acting as a bridge. Enabling this mode deactivates standard VLAN settings, and the device prioritizes packets based solely on the data packet's information. Tagged packets are transmitted as tagged, and untagged packets as untagged.

### Commands

**vlan-unaware { enable | disable }**

<b>Syntax Description</b>	<b>vlan-unaware</b>	Configure the VLAN Unaware mode parameters
	<b>enable</b>	Enable VLAN Unaware mode
	<b>disable</b>	Disable VLAN Unaware mode
<b>Defaults</b>	VLAN unaware mode is disabled by default	
<b>Command Modes</b>	Configuration	
<b>Usage Guidelines</b>	<p>To enable VLAN Unaware mode, the following switch configuration is required:</p> <ul style="list-style-type: none"> <li>• No other VLANs except VLAN 1</li> <li>• All ports configured as access ports.</li> <li>• All ports must have a Port VLAN ID (PVID) of VLAN 1.</li> <li>• The management VLAN must be set to VLAN 1.</li> </ul> <p>VLAN Unaware mode is incompatible with and disables the following settings:</p> <ul style="list-style-type: none"> <li>• GVRP</li> <li>• RSPAN</li> <li>• MSTP</li> <li>• MRP</li> </ul> <p>These features require the creation or use of multiple VLANs.</p>	
<b>Examples</b>	moxa(config)# vlan-unaware enable	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## 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>	Interface Configuration	
<b>Usage Guidelines</b>	If a PVID does not exist for this system, it will be created automatically after configuration. If the port is configured to be in Access Mode, the actions below will be applied automatically. Remove this port from member port list if it is bound to another VID which is different from PVID Modify this port into an untagged member of this PVID If the port is configured to be in Trunk Mode, the port will automatically be modified into a tagged member of this PVID.	
<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 }**

**no switchport acceptable-frame-type**

<b>Syntax Description</b>	<b>acceptable-frame-type</b>	Configure acceptable-frame-type parameters
	<b>all</b>	Configures the acceptable frame type as all which are acceptable and subjected to ingress filtering.
	<b>tagged</b>	Configures the acceptable frame type as tagged.
	<b>untaggedAndPrioritytagged</b>	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-filter**

<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}

**no switchport mode**

<b>Syntax Description</b>	<b>switchport</b>	Configure the switch port
	<b>mode</b>	Configure switch port mode parameters
	<b>access</b>	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.
	<b>trunk</b>	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.
	<b>hybrid</b>	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>	<p>When changing from trunk or hybrid to access mode, the following changes will be automatically applied:</p> <ul style="list-style-type: none"> <li>Forces the port to become an untagged member of the PVID domain</li> <li>If the port exists in another VLAN, it will be removed</li> <li>Forces the accept frame type to be set to "Admit untagged and pri-tagged"</li> </ul> <p>When changing from access or hybrid to trunk mode, the following changes will be automatically applied:</p> <ul style="list-style-type: none"> <li>Forces the port to become a tagged member of the PVID domain</li> <li>If the port was an untagged member in another VLAN, it will change into a tagged member.</li> <li>Forces the accept frame type to be set to "Admit tagged only"</li> </ul> <p>When changing from access or trunk to hybrid mode, there will be no changes</p>	
<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**

**no 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
	<b>default</b>	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.
	<b>enhanced</b>	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>

**no switchport access vlan**

<b>Syntax Description</b>	<b>switchport access</b>	Configure the port as an access port
	<b>vlan</b> <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>	Disregarding 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

## Configure GARP Timer

### Commands

**garp timer {join | leave | leaveall} <time in milli seconds>**

<b>Syntax Description</b>	<b>garp timer</b>	Configure GARP timer parameters
	<b>join</b>	Configure the time (ms) a GARP participant should wait for its join message to be acknowledged before re-sending the join message. The join message is retransmitted only once if the initial message is not acknowledged. The time is counted from the moment the initial join message is sent. The join message is sent by a GARP participant to another GARP participant for registering purposes.
	<b>leave</b>	Configure the time (ms) a GARP participant should wait for any join message before removing attribute details.
	<b>leaveall</b>	Configure the time (ms) the details of the registered attributes are maintained.
	time in milli seconds	Integer value: join – ranges from 10 to 1073741810 leave – ranges from 30 to 2147483630 leaveall – ranges from 40 to 2147483640
<b>Defaults</b>	join - 200ms leave - 600ms leaveall - 10000ms	
<b>Command Modes</b>	Privileged EXEC Interface Configuration	
<b>Usage Guidelines</b>	This command configures GARP timers for a port. GARP uses these timer values to control the transmission of GARP PDUs used in synchronizing attribute information between the switches, and in registering and de-registering of attribute values. The configured GARP timer values are applicable for both GVRP and GMRP application of the GARP module.	
<b>Examples</b>	moxa(config-if)# garp timer join 250	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	show garp timer	

## 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
	<b>port</b>	Display port information
	<b>port-channel</b>	The port channel
	integer	Integer value, should be valid port-channel ID
	interface-type	<b>ethernet</b>
	interface-id	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 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 .....</pre>	
<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

**mac-address-table static unicast** <aa:aa:aa:aa:aa:aa> **vlan** <vlan-id> **set interface** {<interface-type> <slot/port-port,slot/port,...> | **port-channel** <integer>} [**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
	<b>vlan</b>	Configure the VLAN
	vlan-id	The VLAN ID
	<b>set</b>	Set the unicast MAC address to a specified port
	interface-type	The Ethernet type
	slot/port-port	The slot number/port number
	<b>port-channel</b>	The port channel
	integer	Integer value, should be valid port-channel ID
	<b>status</b>	Set the status of the static unicast entry
	<b>permanent</b>	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	

# 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 port-channel	The Ethernet type 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
	<b>cos-priority</b>	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
	<b>queue-id</b>	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
	<b>dscp</b>	Use DSCP priority
	<b>cos</b>	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
	<b>dscp-priority</b>	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
	<b>cos-priority</b>	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
	<b>interface</b>	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
	<b>interface</b>	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-max\_rate)> [**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-max_rate)	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>	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-max\_rate)> [**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-max_rate)	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-max\_rate)> [**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-max\_rate)> [**cbs** <cbs(1-10240)>] [**ebs** <ebs(1-10240)>]  
**conform-action do-nothing 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-max_rate)	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>do-nothing</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 do-nothing 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-max_rate)> [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
	cir (1-max_rate)	Committed information rate in Mbps
	<b>cbs</b>	Committed Burst Size
	cbs (10-10240)	Committed burst size that in KByte
	<b>ebs</b>	Excess Burst Size (or PBS)
	ebs (10-10240)	Excess burst size in KByte
	<b>conform-action</b>	Configure the conform action parameter
	<b>remark-cos</b>	Remark the packet CoS priority
	cos-priority (0-7)	The VLAN priority value
	<b>exceed-action</b>	Configure the exceed action parameter
	<b>drop</b>	Drop the packet
<b>remark-cos</b>	Remark the packet CoS priority	
cos-priority (0-7)	The VLAN priority value	
<b>violate-action</b>	Configure the violate action parameter	
<b>drop</b>	Drop the packet	
<b>remark-cos</b>	Remark the packet CoS priority	
cos-priority (0-7)	The VLAN priority value	
<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>]	

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

### Commands

```
qos rate-limit-type srTCM cir <cir(1-max_rate)> [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-max_rate)	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>]	

## Enable/Disable Port Shutdown

### Commands

**rate-limit port-shutdown { enable | disable }**

<b>Syntax Description</b>	<b>rate-limit</b>	Configure rate limit parameters
	<b>port-shutdown</b>	Configure rate limit port shutdown parameters
	<b>enable</b>	Enable rate limit port shutdown
	<b>disable</b>	Disable rate limit port shutdown
<b>Defaults</b>	Disabled.	
<b>Command Modes</b>	Global configuration mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	MOXA# configure terminal MOXA(config)# rate-limit port-shutdown enable	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	show rate-limit port-shutdown	

## Configure Port Shutdown Release Interval

### Commands

**rate-limit port-shutdown release interval < release\_interval >**

<b>Syntax Description</b>	<b>rate-limit</b>	Configure rate limit parameters
	<b>port-shutdown</b>	Configure rate limit port shutdown parameters
	<b>release interval</b>	Configure the rate limit port shutdown release interval
	release_interval	Configure 特 release time (in min). The integer value ranges from 0 to 10080.
<b>Defaults</b>	Default release interval is 60.	
<b>Command Modes</b>	Global configuration mode	
<b>Usage Guidelines</b>	Release interval 0 means the port will be shut down until manually re-enabled.	
<b>Examples</b>	MOXA# configure terminal MOXA(config)# rate-limit port-shutdown release interval 120	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	show rate-limit port-shutdown	

## Configure Port Shutdown Settings

### Commands

**rate-limit port-shutdown**

**no rate-limit port-shutdown**

<b>Syntax Description</b>	<b>rate-limit</b>	Configure rate limit parameters
	<b>port-shutdown</b>	Enable or disable rate limit port shutdown
<b>Defaults</b>	N/A	
<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)# rate-limit port-shutdown MOXA(config-if)# no rate-limit port-shutdown	
<b>Error Messages</b>	Invalid: Rate Limit function can not be enabled on Turbo Ring / Turbo Chain ports. Invalid: The port cannot join the Port-Channel and enable rate limit at the same time.	
<b>Related Commands</b>	show rate-limit port-shutdown	

## Configure Port Shutdown Threshold

### Commands

**rate-limit port-shutdown port threshold** <threshold value>

<b>Syntax Description</b>	<b>rate-limit</b>	Configure rate limit parameters
	<b>port-shutdown</b>	Configure rate limit port shutdown parameters
	<b>port</b>	Configure the port-based rate limit port shutdown parameters
	<b>threshold</b>	Configure the rate limit port shutdown port threshold parameters
	threshold_value	Specify the port shutdown threshold value (in Mbps). The valid range depends on the maximum transmission rate of the port.
<b>Defaults</b>	The default threshold is the port's maximum transmission rate.	
<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)# rate-limit port-shutdown port threshold 100	
<b>Error Messages</b>	Invalid: The value of the traffic rate limit threshold should be less than the module port speed.	
<b>Related Commands</b>	show rate-limit port-shutdown	

## 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
	<b>interface</b>	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)>}]
-------------------------	--

## Show Port Shutdown Settings

### Commands

**show rate-limit port-shutdown**

<b>Syntax Description</b>	<b>show</b>	Display configuration/status information
	<b>rate-limit</b>	Display QoS rate limit information
	<b>port-shutdown</b>	Display rate limit port shutdown information
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	MOXA# show rate-limit port-shutdown	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	rate-limit port-shutdown	

## Scheduler

### Configure Qos Scheduler Type Setting

#### Commands

**qos scheduler-type {strict-priority | wrr | one-sp-seven-wrr | two-sp-six-wrr}**

<b>Syntax Description</b>	<b>qos</b>	Configure QoS parameters
	<b>scheduler-type</b>	Configure the QoS scheduling type.
	<b>strict-priority</b>	Use strict priority queuing.
	<b>wrr</b>	Use weighted round robin.
	<b>one-sp-seven-wrr</b>	Use a combination of 1 strict priority queue and 7 weighted round robin queues.
	<b>two-sp-six-wrr</b>	Use a combination of 2 strict priority queues and 6 weighted round robin queues.
<b>Defaults</b>	scheduler-type = strict-priority	
<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> ]	

## Configure queue setting

### Commands

**qos queue <queue(1-8)> weight <weight(1-100)>**

<b>Syntax Description</b>	<b>qos</b>	Configure QoS parameters
	<b>queue</b>	Configure QoS queue parameters.
	<b>&lt;queue(1-8)&gt;</b>	Configure a QoS queue by index (1-8).
	<b>weight</b>	Configure the queue weight.
	<b>&lt;weight(1-100)&gt;</b>	Specify the queue weight (1-100).
<b>Defaults</b>	From highest priority queue to lowest priority queue is 8, 8, 4, 4, 2, 2, 1 and 1	
<b>Command Modes</b>	Interface configuration mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa (config-if)# qos queue 1 weight 1	
<b>Error Messages</b>	Invalid: The weight assigned to higher index queues must be greater than or equal to the weight assigned to the preceding lower index queue.	
<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>interface</b>	Interface information								
	<b>iftype</b>	Interface type								
	<b>ifnum</b>	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 int eth 1/1                 Queue weight Port          Type   Q1   Q2   Q3   Q4   Q5   Q6   Q7   Q8 ----- Eth1/1       WRR    93   94   95   96   97   98   99  100  moxa# show qos scheduler                 Queue weight Port          Type   Q1   Q2   Q3   Q4   Q5   Q6   Q7   Q8 ----- Eth1/1       WRR    93   94   95   96   97   98   99  100 Eth1/2       1SP7WRR 43   44   45   46   47   48   49   SP Eth1/3       2SP6WRR 23   24   25   26   27   28   SP   SP Eth1/4       SP     --   --   --   --   --   --   --   -- Eth2/1       SP     --   --   --   --   --   --   --   -- Eth2/2       SP     --   --   --   --   --   --   --   -- Eth2/3       SP     --   --   --   --   --   --   --   -- Eth2/4       SP     --   --   --   --   --   --   --   -- Eth3/1       SP     --   --   --   --   --   --   --   -- Eth3/2       SP     --   --   --   --   --   --   --   -- Eth3/3       SP     --   --   --   --   --   --   --   -- Eth3/4       SP     --   --   --   --   --   --   --   --</pre>									
<b>Error Messages</b>	N/A									
<b>Related Commands</b>	moxa (config-if)# qos scheduler-type {strict-priority   wrr   one-sp-seven-wrr   two-sp-six-wrr}									
	moxa(config-if)# qos queue <queue(1-8)> weight <weight(1-100)>									

## Egress Shaper

### Configure Shaper Setting

#### Commands

**qos shaper cir** <cir(1-max\_rate)> [**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-max_rate)	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
	<b>interface</b>	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 shaper interface ethernet 1/1 QoS Shaper Statue of Interface Ethernet 1/1 ----- CIR : 1000 CBS : 2000 -----  moxa# show qos shaper QoS Shaper Statue of Interface Ethernet 1/1 ----- CIR : Disable CBS : Disable QoS Shaper Statue of Interface Ethernet 1/2 ----- CIR : Disable CBS : Disable .....</pre>	
<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
	<b>enable</b>	Enable system-based IGMP Snooping
	<b>disable</b>	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
	<b>no</b>	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>	moxa# show igmp-snooping [vlan < vlanid> ]	

## 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>	moxa# show igmp-snooping [vlan < vlanid> ]	

## Configure IGMP Snooping General Query Interval

### Commands

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

**no igmp-snooping query-interval**

<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>	<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>	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>	<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>	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																
	<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 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										
	<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 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
	<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 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>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
	<b>enable</b>	Enable GMRP on all switch ports and automatically start the GARP on the switch if the GARP is disabled.
	<b>disable</b>	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**

**no group restricted**

<b>Syntax Description</b>	<b>group restricted</b>	Configure the restricted group registration on a specified 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>	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
	<b>vlan</b> <vlan-id>	The VLAN ID of the VLAN the multicast destination MAC address belongs to
	<b>add</b>	Add the new interface port and forbidden port.
	<b>set</b>	Overwrite the new interface port and forbidden port
	<b>interface</b>	Configure member ports details.
	interface-type	The Ethernet type
	slot/port-port	The slot number/port number.
	<b>port-channel</b>	The port channel
	integer	Integer value, should be valid port-channel ID
	<b>forbidden-ports</b>	Configure the set of ports to which frames destined for a specific multicast MAC address must not be forwarded, such as from GMRP.
	<b>status</b>	The status of the static multicast entry.
	<b>permanent</b>	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 01:00:5e: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 RSTP

##### Commands

**rstp { enable | disable }**

<b>Syntax Description</b>	<b>rstp</b>	Configure RSTP
	<b>enable</b>	Enable RSTP
	<b>disable</b>	Disable RSTP
<b>Defaults</b>	Disabled	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# configure terminal moxa(config)# rstp enable moxa(config)# rstp disable	
<b>Error Messages</b>	Invalid: Two redundant protocols can not use the same port. Invalid: Port channel member port can not be assigned to a redundant protocol. Invalid: Redundant Protocol and Port Security can not be enabled on the same port. Invalid: Redundant Protocol and 802.1x/MAB can not be enabled on the same port. Invalid: A maximum of two redundant protocols can be enabled. Invalid: Turbo Chain and STP/RSTP can not be enabled at the same time. Invalid: Turbo Ring V2 and STP/RSTP can not be enabled at the same time.	
<b>Related Commands</b>	show spanning-tree	

#### Enable/Disable Spanning Tree BPDU Guard

##### Commands

**spanning-tree bpduguard**

**no spanning-tree bpduguard**

<b>Syntax Description</b>	<b>no</b>	Disables the configuration / deletes the entry / resets to default value
	<b>spanning-tree</b>	Configures spanning tree related protocol
	<b>bpduguard</b>	Put an interface in the error-disabled state when it receives BPDU
<b>Defaults</b>	spanning-tree bpduguard is disabled by default.	
<b>Command Modes</b>	Interface Configuration	
<b>Usage Guidelines</b>		
<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	

#### Enable/Disable Spanning Tree BPDU Filter

##### Commands

**spanning-tree bpdfilter**

**no spanning-tree bpdfilter**

<b>Syntax Description</b>	<b>no</b>	Disables the configuration / deletes the entry / resets to default value
	<b>spanning-tree</b>	Configures spanning tree related protocol
	<b>bpdufilter</b>	BPDU filtering configuration
<b>Defaults</b>	spanning-tree bpdufilter is default disabled	
<b>Command Modes</b>	Interface Configuration	
<b>Usage Guidelines</b>		
<b>Examples</b>	<pre>moxa# configure terminal moxa(config)# interface ethernet 1/1 moxa(config-if)# spanning-tree bpdufilter moxa(config-if)# no spanning-tree bpdufilter</pre>	
<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 Spanning Tree Root Guard

### Commands



**spanning-tree rootguard**

**no spanning-tree rootguard**

<b>Syntax Description</b>	<b>no</b>	Disables the configuration / deletes the entry / resets to default value
	<b>spanning-tree</b>	Configures spanning tree related protocol
	<b>rootguard</b>	Restricted forwarding on an interface
<b>Defaults</b>	spanning-tree rootguard is default disabled	
<b>Command Modes</b>	Interface Configuration	
<b>Usage Guidelines</b>	Root guard function cannot be enabled on a port enabling loop guard	
<b>Examples</b>	<pre>moxa# configure terminal moxa(config)# interface ethernet 1/1 moxa(config-if)# spanning-tree rootguard moxa(config-if)# no spanning-tree rootguard</pre>	
<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	

## Enable/Disable Spanning Tree Loop Guard

### Commands

**spanning-tree loopguard**

**no spanning-tree loopguard**

<b>Syntax Description</b>	<b>no</b>	Disables the configuration / deletes the entry / resets to default value
	<b>spanning-tree</b>	Configures spanning tree related protocol
	<b>loopguard</b>	Restricted forwarding on an interface
<b>Defaults</b>	spanning-tree loopguard is default disabled	
<b>Command Modes</b>	Interface Configuration	
<b>Usage Guidelines</b>	Loop guard function cannot be enabled on a port enabling portfast Loop guard function cannot be enabled on a port enabling root guard	
<b>Examples</b>	<pre>moxa# configure terminal moxa(config)# interface ethernet 1/1 moxa(config-if)# spanning-tree loopguard moxa(config-if)# no spanning-tree loopguard</pre>	
<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	

## Enable/Disable Spanning Tree Error Disable Timer

### Commands

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

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

<b>Syntax Description</b>	no	Disables the configuration / deletes the entry / resets to default value
	spanning-tree	Configures spanning tree related protocol
	errordisable	Configures error disable timer
	recovery-interval	Interval (in seconds) Port recovery from error disabled state
<b>Defaults</b>	300	
<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 Detected Spanning Tree Protocols

### Commands

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

<b>Syntax Description</b>	clear	Clears the configurations
	spanning-tree	Configures spanning tree related protocol
	detected	Spanning-tree detected protocols
	protocols	Spanning-tree detected protocols
<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>	show	Displays the Configuration /statistics/General Information			
	spanning-tree	Spanning-Tree related information			
	bridge	Spanning-tree configuration of the bridge			
<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				
	Bridge ID	HelloTime	MaxAge	FwdDly	Protocol
	-----	-----	-----	-----	-----
	80:00:00:01:02:03:04:05	2 sec	20 sec	15 sec	rstp
	moxa#				
<b>Error Messages</b>	N/A				
<b>Related Commands</b>					



## Show Spanning Tree Root Information

### Commands

**show spanning-tree root**

<b>Syntax Description</b>	show	Displays the Configuration /statistics/General Information
	spanning-tree	Spanning-Tree related information
	root	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>	<pre>moxa# show spanning-tree root Root ID          RootCost    MaxAge    DwdDly    RootPort -----          - 00:00:00:00:00:00  0           20 sec    15sec     0</pre>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>		

## 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>	show	Displays the Configuration /statistics/General Information
	spanning-tree	Spanning-Tree related information
	interface	spanning-tree interface information
	detail	Detail information about the port and bridge
	inconsistency	Spanning tree inconsistent state for spanning tree
<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 Role      State      Cost      Prio Type ----      - Disabled Disabled 200000000 128 SharedLan moxa# show spanning-tree interface ethernet 1/2 inconsistency BPDU Inconsist: False Root Inconsist: False Loop Inconsist: False</pre>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Show Spanning Tree Detail

### Commands

**show spanning-tree [detail]**

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

<b>Syntax Description</b>	show	Displays the Configuration /statistics/General Information
	spanning-tree	Spanning-Tree related information
	detail	Detailed spanning-tree information
	active	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 [7] Port 7 Max Age 20 sec Forward Delay 15 sec</pre>	

```

Hello Time 2 sec
Spanning tree Protocol has been disabled
Bridge Id Priority 32768
Address 00:01:02:03:04:05
Hello Time 2 sec
Max Age 20 sec
Forward Delay 15 sec
Port Enable Role State Cost Prio Type
---- ---- -
Eth1/1 Disabled Disabled Disabled 200000000 128 SharedLan
Eth1/2 Disabled Disabled Disabled 200000000 128 SharedLan
Eth1/3 Disabled Disabled Disabled 200000000 128 SharedLan
Eth1/4 Disabled Disabled Disabled 200000000 128 SharedLan
Eth2/1 Disabled Disabled Disabled 200000000 128 SharedLan
Eth2/2 Disabled Disabled Disabled 200000000 128 SharedLan
Eth2/3 Disabled Disabled Disabled 200000000 128 SharedLan
Eth2/4 Disabled Disabled Disabled 200000000 128 SharedLan
Eth3/1 Disabled Disabled Disabled 200000000 128 SharedLan
Eth3/2 Disabled Disabled Disabled 200000000 128 SharedLan
Eth3/3 Disabled Disabled Disabled 200000000 128 SharedLan
Eth3/4 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 9, address 00:00:00:00:00:00
Designated Bridge has priority @, address 00:00:00:00:00:00
Designated Port Id is 0.0, Designated PathCost 0
No of Transitions 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.
Amin LinkType is Auto, Oper LinkType is Shared-Lan
BPDUs : sent 0 , received 0
Timers: Hello - 0, Forward Delay - 0, Topology Change - 0,
Error Disable Recovery Interval 300 sec

Port 2 [Eth1/2] is Disabled , Disabled
Port PathCost 200000000, Port Priority 128, Port Identifier 128.2
Designated Root has priority 9, address 00:00:00:00:00:00
Designated Bridge has priority 0, address 00:00:00:00:00:00
Designated Port Id is 0.0, Designated PathCost 0
No of Transitions to forwarding State :0
Auto-Edge is enabled PortFast is disabled, Oper-Edge is disabled
BPDU Filtering is disabled.
BPDU Guard is disabled.

```

<b>Error Messages</b>	N/A
<b>Related Commands</b>	N/A



## 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>	<pre>moxa# configure terminal moxa(config)# interface ethernet 1/1 moxa(config-if)# spanning-tree moxa(config-if)# no spanning-tree</pre>	
<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
	<b>stp</b>	Spanning Tree Protocol configuration
	<b>rstp</b>	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
	<b>enable</b>	Enable MSTP
	<b>disable</b>	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	

## Configure the Maximum Number of Hops Permitted in MST to the Default Value

### Commands

**no spanning-tree mst max-hops**

<b>Syntax Description</b>	<b>no</b>	Reset spanning tree parameters to the default value
	<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
<b>Defaults</b>	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 max-hops	
<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>Defaults</b>	<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 { <iftype> <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
	iftype	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 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-type> <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-type	<b>ethernet</b>
	interface-id	The interface ID: slot number/port number
	<b>port-channel</b>	The port channel
	integer	Integer value, should be valid port-channel ID
<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>	% Invalid Interface	
<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
	<b>ethernet</b> <slot/port>	The Ethernet slot or port number
	<b>port-channel</b> <id>	The port channel ID
	<b>detail</b>	Detailed information about the port and bridge
	<b>inconsistency</b>	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
	<b>detail</b>	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 sex, 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

This command displays the current configuration or status of Turbo Ring V2 and Ring Coupling.

#### 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
	<b>config</b>	Ring configuration information
	<b>status</b>	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 Coupling Mode: Static   Ring 1:     Enable: enabled     Set as master: disabled     1st Ring Port: Eth1/15     2nd Ring Port: Eth1/16   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: Eth1/5  moxa# show turbo-ring-v2 config Turbo Ring V2 Module is enabled Ring Coupling Mode: Dynamic   Ring 1:     Enable: enabled     Set as master: disabled     1st Ring Port: Eth1/15     2nd Ring Port: Eth1/16   Coupling Group 1:     Enable: enabled     Port ID: Eth1/1     Port Coupling Mode: Auto   Coupling Group 2:     Enable: disabled     Port ID: Eth1/2     Port Coupling Mode: Primary  moxa# show turbo-ring-v2 status Turbo Ring V2 status:   Global Enable: Enabled   Ring Coupling Mode: Static   Ring 1:     Status: Healthy     Master/Slave: Master     Master ID: 00:09:E8:02:02:02     1st Ring Port Status: Eth1/15 Forwarding     2nd Ring Port Status: Eth1/16 Blocking   Ring 2:</pre>	

```

Status:---
Master/Slave:---
Master ID: 00:00:00:00:00:00
1st Ring Port Status:---
2nd Ring Port Status:---
Coupling:
Mode: Ring Coupling(primary)
Coupling Port: Eth1/2 Link down

moxa# show turbo-ring-v2 status

Turbo Ring V2 status:
Global Enable: Enabled
Ring Coupling Mode: Dynamic
Ring Index: 1
Total Ring Number: 2
Ring 1:
Status: Healthy
Master/Slave: Slave
Master ID: 00:09:E8:02:02:02
1st Ring Port Status: Eth1/15 Forwarding
2nd Ring Port Status: Eth1/16 Blocking
Coupling Group 1:
Group Status: Active
Port ID: Eth1/1
Status: Forwarding
Coupling Group 2:
Group Status: Inactive
Port ID: --
Status: --

moxa# show turbo-ring-v2 status

Turbo Ring V2 status:
Global Enable: Enabled
Ring Coupling Mode: Dynamic
Ring Index: 1
Total Ring Number: 2
Ring 1:
Status: Healthy
Master/Slave: Master
Master ID: 00:09:E8:02:02:02
1st Ring Port Status: Eth1/15 Forwarding
2nd Ring Port Status: Eth1/16 Blocking
Coupling Group 1:
Group Status: Active
Primary Port
Switch MAC: 00:09:E8:02:02:02
Port ID: Eth1/1
Status: Forwarding
Backup Port
Switch MAC: 00:09:E8:03:03:03
Port ID: Eth1/2
Status: Link Up
Coupling Group 2:
Group Status: Inactive
Primary Port
Switch MAC: 00:09:E8:04:04:04
Port ID: Eth1/3
Status: Link Down
Backup Port
Switch MAC: 00:09:E8:05:05:05

```

	Port ID: Eth1/4 Status: Link Down
<b>Error Messages</b>	N/A
<b>Related Commands</b>	turbo-ring-v2

## Configure Redundancy Mode Settings

### Commands

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

<b>Syntax Description</b>	<b>turbo-ring-v2</b>	Configure Turbo Ring V2 parameters
	<b>enable</b>	Enable Turbo Ring V2
	<b>disable</b>	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 Coupling Mode Settings

This command configures ring coupling mode. To enable Dynamic Ring Coupling, select 'dynamic' mode to set rings to be dynamically coupled. Select 'static' mode to set rings to be statically coupled.

### Commands

**turbo-ring-v2 ring-coupling-mode** { **static** | **dynamic** }

<b>Syntax Description</b>	<b>turbo-ring-v2</b>	Configure Turbo Ring V2 parameters
	<b>ring-coupling-mode</b>	Configure Ring Coupling mode parameters
	<b>static</b>	Configure Static Ring Coupling mode
	<b>dynamic</b>	Configure Dynamic Ring Coupling mode
<b>Defaults</b>	The feature is static by default.	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# turbo-ring-v2 ring-coupling-mode static moxa(config)# turbo-ring-v2 ring-coupling-mode dynamic	
<b>Error Messages</b>	% Turbo Ring V2: Invalid: Dynamic Ring Coupling groups cannot be enabled in Static Ring Coupling mode.	
	% Turbo Ring V2: Invalid: Static Ring Coupling groups cannot be enabled in Dynamic Ring Coupling mode.	
<b>Related Commands</b>		

## 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>
	<b>port-channel</b>	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>
<b>port-channel</b>	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)# no turbo-ring-v2 dynamic-ring-coupling coupling-groups 1	
<b>Error Messages</b>	% Turbo Ring V2: Invalid: Dynamic Ring Coupling mode cannot be selected if Ring 2 is enabled.	
	% Turbo Ring V2: Invalid: Dynamic Ring Coupling groups cannot be enabled if Ring 2 is enabled.	
	% Turbo Ring V2: Invalid: Dynamic Ring Coupling groups cannot be enabled if Ring 1 is disabled.	
	% Turbo Ring V2: Invalid: The same port cannot be assigned as the coupling port in different coupling groups.	
<b>Related Commands</b>	show turbo-ring-v2 { config   status }	

## Configure Dynamic Ring Coupling Settings

This command configures a specific coupling group (1 or 2) and designates the coupling port as either auto, primary, or backup mode.

### Commands

**turbo-ring-v2 dynamic-ring-coupling coupling-groups** <group(1-2)> **interface** <interface-type> <interface-id> { **auto** | **backup** | **primary** }

<b>Syntax Description</b>	<b>turbo-ring-v2</b>	Configure Turbo Ring V2 parameters
	<b>dynamic-ring-coupling</b>	Configure Dynamic Ring Coupling parameters
	<b>coupling-groups</b>	Configure coupling group parameters
	<group(1-2)>	Group ID related configuration
	<b>interface</b>	Port interface
	<interface-type>	Ethernet interface
	<interface-id>	Slot Number/Port Number
	<b>auto</b>	Coupling auto mode
	<b>backup</b>	Coupling backup mode
<b>primary</b>	Coupling primary mode	
<b>Defaults</b>	Coupling mode is set to auto by default.	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	N/A	
<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>	N/A	

The no form of this command is group-specific.

### Commands

**turbo-ring-v2 dynamic-ring-coupling coupling-groups** <group(1-2)> **interface** <interface-type> <interface-id> { **auto** | **backup** | **primary** }

<b>Syntax Description</b>	<b>turbo-ring-v2</b>	Configure Turbo Ring V2 parameters
	<b>dynamic-ring-coupling</b>	Configure Dynamic Ring Coupling parameters
	<b>coupling-groups</b>	Configure coupling group parameters
	<group(1-2)>	Group ID related configuration
	<b>interface</b>	Port interface
	<interface-type>	Ethernet interface
	<interface-id>	Slot Number/Port Number
	<b>auto</b>	Coupling auto mode
	<b>backup</b>	Coupling backup mode
<b>primary</b>	Coupling primary mode	
<b>Defaults</b>	Coupling mode is set to auto by default.	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	N/A	
<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>	N/A	

## MRP

### Show MRP Information

#### Commands

##### show mrp

<b>Syntax Description</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 Description</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
	<b>manager</b>	Set the MRP role to Manager
	<b>client</b>	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
	<b>default</b>	Set the domain UUID to the default UUID
	<b>profinet</b>	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
	<b>enable</b>	Enable MRP react on link change
	<b>disable</b>	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 ring-port-1** <iftype> <ifnum> **ring-port-2** <iftype> <ifnum>

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

## Configure MRP Interconnection

### Commands

**mrp interconnection** { **enable** | **disable** }

<b>Syntax Description</b>	<b>mrp</b>	Configure MRP
	<b>interconnection</b>	MRP interconnection
	<b>enable</b>	Enable MRP interconnection
	<b>disable</b>	Disable MRP interconnection
<b>Defaults</b>	The default MRP interconnection is disabled.	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# mrp interconnection enable	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	show mrp	

## Specify MRP Interconnection ID

### Commands

**mrp interconnection IID <integer(0-65535)>**

<b>Syntax Description</b>	<b>mrp</b>	Configure MRP
	<b>interconnection</b>	MRP interconnection
	<b>IID</b>	Interconnection ID
	<b>&lt;integer(0-65535)&gt;</b>	Interconnection ID
<b>Defaults</b>	The default MRP interconnection ID is 0.	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# mrp interconnection IID 1	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	show mrp	

## Specify MRP Interconnection Role

### Commands

**mrp interconnection role { manager | client }**

<b>Syntax Description</b>	<b>mrp</b>	Configure MRP
	<b>interconnection</b>	MRP interconnection
	<b>role</b>	Interconnection role
	<b>manager</b>	Configure Interconnection role as Manager
	<b>client</b>	Configure Interconnection role as Client
<b>Defaults</b>	The default MRP interconnection role is client.	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# mrp interconnection role manager	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	show mrp	

## Specify MRP Interconnection Mode

### Commands

**mrp interconnection mode { lc-mode | rc-mode }**

<b>Syntax Description</b>	<b>mrp</b>	Configure MRP
	<b>interconnection</b>	MRP interconnection
	<b>mode</b>	Interconnection mode
	<b>lc-mode</b>	Configure Interconnection mode as LC mode
	<b>rc-mode</b>	Configure Interconnection mode as RC mode
<b>Defaults</b>	The default MRP interconnection mode is LC mode.	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# mrp interconnection mode rc-mode	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	show mrp	

## Configure MRP Interconnection Interface

### Commands

**mrp interconnection interface <iftype> <ifnum>**

<b>Syntax Description</b>	<b>mrp</b>	Configure MRP
	<b>interconnection</b>	MRP interconnection
	<b>interface</b>	Interconnection port interface
	<b>&lt;iftype&gt; &lt;ifnum&gt;</b>	Ex. ethernet 2/1
<b>Defaults</b>		
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# mrp interconnection interface ethernet 2/1	
<b>Error Messages</b>	% MRP: Invalid: Port Channel port couldn't be set as MRP interconnection port simultaneously !!! % MRP: Invalid: Dual Homing port couldn't be set as MRP interconnection port simultaneously !!! % MRP: Invalid: The MRP interconnection port couldn't be set as MRP ring ports simultaneously !!!	
<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
	<b>enable</b>	Enable SNMP server access
	<b>disable</b>	Disable SNMP server access
	<b>read-only</b>	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
	<b>v1-v2c-v3</b>	Set the SNMP server version to v1-v2c-v3
	<b>v1-v2c</b>	Set the SNMP server version to v1-v2c
	<b>v3</b>	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** | **sha-256** | **sha-512** } [**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
	<b>read-only</b>	Give read-only access to the user
	<b>read-write</b>	Give read-write access to the user
	<b>auth-type</b>	Configure the authentication protocol for the SNMP server user account
	<b>none</b>	Do not use any authentication protocol
	<b>md5</b>	Use MD5 authentication
	<b>sha</b>	Use SHA authentication
	<b>sha-256</b>	Use SHA-256 authentication
	<b>sha-512</b>	Use SHA-512 authentication
	<b>auth-passwd</b>	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
	<b>disable</b>	Disable data encryption
	<b>des</b>	Use DES data encryption
<b>aes</b>	Use AES data encryption	
<b>encryption-key</b>	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
	<b>trap-v1</b>	Use trap-v1 mode
	<b>trap-v2c</b>	Use trap-v2c mode
	<b>inform-v2c</b>	Use inform-v2c mode
	<b>trap-v3</b>	Use trap-v3 mode
	<b>inform-v3</b>	Use inform-v3 mode
	<b>community</b>	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 | sha-256 | sha-512 } [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
	<b>none</b>	Do not use any authentication protocol
	<b>md5</b>	Use MD5 authentication
	<b>sha</b>	Use SHA authentication
	<b>sha-256</b>	Use SHA-256 authentication
	<b>sha-512</b>	Use SHA-512 authentication
	<b>auth-passwd</b>	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
	<b>disable</b>	Disable data encryption
	<b>des</b>	Use DES data encryption
<b>aes</b>	Use AES data encryption	
<b>encryption-key</b>	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

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
	<b>http</b>	Configure HTTP management UI service parameters
	<b>https</b>	Configure HTTPS management UI service parameters
	<b>telnet</b>	Configure Telnet management UI service parameters
	<b>ssh</b>	Configure SSH management UI service parameters
	<b>moxa-command</b>	Configure Moxa Command management UI service parameters
	<b>server</b>	Configure management UI service server parameters
	<b>enable</b>	Enable the management UI service
<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
	<b>http</b>	Configure HTTP management UI service parameters
	<b>https</b>	Configure HTTPS management UI service parameters
	<b>telnet</b>	Configure Telnet management UI service parameters
	<b>ssh</b>	Configure SSH management UI service parameters
	<b>moxa-command</b>	Configure Moxa Command management UI service parameters
	<b>server</b>	Configure management UI service server parameters
	<b>disable</b>	Disable the management UI service
<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
	<b>http</b>	Configure HTTP management UI service parameters
	<b>https</b>	Configure HTTPS management UI service parameters
	<b>telnet</b>	Configure Telnet management UI service parameters
	<b>ssh</b>	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
	<b>enable</b>	Enable login lockout
	<b>disable</b>	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	

## Show Login Lockout

### Commands

#### show login lockout

<b>Syntax Description</b>	<b>show</b>	Display running information
	<b>login</b>	Display login information
	<b>lockout</b>	Displays the maximum number of fail login attempts and the lockout time to block the user
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# show login lockout  Enable: False Lockout: 10 Attempts: 3	
<b>Error messages</b>	N/A	
<b>Related commands</b>	N/A	

## Trusted Access

### Configure Trusted Access Settings

#### Commands

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

**no trusted-access ip-source** <ucast\_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
	ucast_addr	Configure the network or host IP address
	ip_mask	Configure the subnet mask of the IP address
	/	Configure the CIDR notation
	short (0-32)	Configure the prefix length
<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 | disable}

<b>Syntax Description</b>	<b>trusted-access</b>	Configure IP trusted access parameters
	<b>enable</b>	Enable the IP trusted access list
	<b>disable</b>	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
	<b>radius</b>	Configure a RADIUS authentication server
	<b>local</b>	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
	<b>enable</b>	Enable dot1x authentication
	<b>disable</b>	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
	<b>auto</b>	Enable 802.1X authentication on the interface
	<b>force-authorized</b>	Allow all traffic without any restrictions
	<b>force-unauthorized</b>	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
	<b>quiet-period</b>	The number of seconds that the switch remains in the quiet state following a failed authentication exchange with the client
	<b>reauth-period</b>	The number of seconds between re-authentication attempts
	<b>server-timeout</b>	The number of seconds that the switch waits for the retransmission of packets by the switch to the authentication server
	<b>supp-timeout</b>	The number of seconds that the switch waits for the retransmission of packets by the switch to the client
	<b>tx-period</b>	The number of seconds that the switch waits for a response to an EAP-request/identity frame from the client before retransmitting the request
	<b>no</b>	Set the dot1x timers to their default values
<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
	<b>interface</b>	
	interface-type	The interface type
	interface-id	The slot number/port number
	<b>local-database</b>	Display the dot1x authentication server database with user names
	<b>all</b>	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.
	<b>auth-port</b>	Configure a specific UDP destination port on this RADIUS server to be used exclusively for authentication requests.
	<b>timeout</b>	Configure the time period in seconds for which a client waits for a response from the server before re-transmitting the request.
	<b>retransmit</b>	Configure the maximum number of attempts to be tried by a client to get a response from the server for a request.
	<b>key</b>	Configure the per-server encryption key.
	<b>primary</b>	Set the RADIUS server as the primary server.
	no	Delete the RADIUS server configuration
<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
	<b>password</b>	Configure the password for the new entry
	<b>no</b>	Delete the entry from the dot1x authentication server database
<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
	<b>enable</b>	Enable MAB on the switch
	<b>disable</b>	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
	<b>aaa</b>	Configure AAA services related parameters
	<b>auth</b>	Authentication related configuration
	<b>radius</b>	Configure RADIUS as the authentication mode
	<b>local</b>	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>	moxa(config-if)# mab moxa(config-if)# no mab	
<b>Error messages</b>	moxa(config-if)# mab  Cannot enable MAB while < Link Aggregation, RSTP, MSTP, Dual-Homing, Turbo Ring v2, Turbo Chain, 802.1X, Port Security> be enabled.  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  Cannot enable MAB on an interface while it's configured as forwarding port in static unicast table.	
<b>Warning messages</b>	N/A	
<b>Related commands</b>	show mab	



<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
	<b>mac-address</b>	Unicast MAC address
	<b>all</b>	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																																																																																		
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																																																																																		
<b>Error messages</b>	N/A																																																																																					
<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

## 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)
	<b>static-port-lock</b>	Use Static Port Lock mode
	<b>mac-sticky</b>	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
	<b>enable</b>	Enable port security
	<b>disable</b>	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>	<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 redundant protocol cannot be enabled on the same port.'</p>	
<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
	<b>limit</b>	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)
	<b>violation</b>	Configure the violation action on the port
	<b>packet-drop</b>	Drop the packet when a violation occurs
	<b>port-shutdown</b>	Shut down the port when a violation occurs
	<b>mac-address</b>	The new MAC address
	ucast_mac	The unicast MAC address
	<b>vlan</b>	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
	<b>limit</b>	The maximum number of addresses on the port
	<b>mac-address</b>	The new MAC address
	mac_addr	The MAC address
	<b>vlan</b>	The new VLAN ID
	integer (1-4094)	The VLAN ID ranging from 1 to 4094
	<b>all</b>	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
	<b>address</b>	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	

## MAC Security (MACsec)

### Enabling MAC Security Globally

#### Commands

**macsec** { enable | disable }

<b>Syntax Description</b>	macsec enable macsec disable	Globally enable MACsec Globally disable MACsec
<b>Defaults</b>	Disable	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# macsec enable	
<b>Error Messages</b>	Invalid: Dot1x must be enabled before activating the MACsec feature.	
<b>Related Commands</b>	N/A	

### MAC Security on a Port Interface

#### Commands

**macsec**

**no macsec**

<b>Syntax Description</b>	macsec no macsec	Configure mka participant to enable. 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>	moxa(config-if)# macsec	
<b>Error Messages</b>	Invalid: MACsec cannot be enabled on member ports of a port channel.	
<b>Related Commands</b>	N/A	

### Deleting a CKN

#### Commands

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

<b>Syntax Description</b>	no mka participant ckn	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 deletes the connectivity association key name (CKN).	
<b>Examples</b>	moxa(config-if)# no mka participant ckn	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Creating a Pre-shared Key

### Commands

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

<b>Syntax Description</b>	mka participant ckn <string (1-16)> cak <string (1-16)>	Create the pre-shared key by configuring the connectivity association key name (CKN) and connectivity association key (CAK).
	key-server enable	Configure key-server enable.
	key-server disable	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>	moxa(config-if)# mka participant ckn moxackn cak moxacak key-server enable	
<b>Error Messages</b>	Invalid: Both the CKN and CAK values must be entered. Invalid: The CKN and CAK values cannot be empty on a MACsec-enabled port. Invalid: CKN entries cannot be the same.	
<b>Related Commands</b>	N/A	

## Show MAC Security Status

### Commands

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

<b>Syntax Description</b>	show macsec	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>	<pre> moxa# show macsec MACsec                               : Enabled Periodic Hello-Time                   : 2  moxa# show macsec interface ethernet 1/2 Mka Pae Kay Info for Eth1/2 ----- MACsec Port                           : Enabled Priority                               : 112   (supported since NOS 6.0)  moxa# show macsec mka participant interface eth 4/8 Mka Participant Info Eth4/8 ----- Participant CKN                       : moxackn KeyServer                             = Disabled (deprecated since NOS 6.0) KeyServer                             : Yes   (supported since NOS 6.0)  Product# show macsec mka peer ckn moxackn interface ethernet 4/8 Mka Peer List Info Eth4/8 ----- MkaParticipant CKN                   : moxackn MkaPeerList MI                       : d7034342ddb9221c41f725da MkaPeerList MN                       : 2099 MkaPeerList Type                     : LivePeerList MkaPeerList SCI                      : 00010203040a0021 </pre>	
<b>Error Messages</b>	<p>If CKN not exists and interface is valid:  Product# show macsec mka peer ckn moxackn interface ethernet 4/6  No corresponding CKN exists.</p> <p>If CKN exists, interface is valid, and no peer exists:  Product# show macsec mka peer ckn moxackn interface ethernet 4/6  No corresponding peer exists in the Peer List.</p>	
<b>Related Commands</b>	N/A	

## Configure MKA PDU Key Priority

### Commands

**mka key-server priority** <integer (0-255)>

**no mka key-server priority**

<b>Syntax Description</b>	mka key-server priority	Configure priority value
	no key-server priority	Configure priority value to the default
<b>Defaults</b>	112 (0x70)	
<b>Command Modes</b>	Global configuration	
<b>Usage Guidelines</b>	This command configures priority value in MKA PDUs.	
<b>Examples</b>	moxa (config-if)# mka key-server priority 200	
	Re-enabling MACsec is required after a completed handshake. moxa (config-if)# no mka key-server priority	
<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(625-1488100)>

**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
	<b>bc</b>	Configure broadcast packet storm control parameters
	<b>mc</b>	Configure multicast packet storm control parameters
	<b>dlf</b>	Configure unicast packet storm control parameters
	<b>bc_mc</b>	Configure broadcast and multicast packet storm control parameters
	<b>bc_dlf</b>	Configure broadcast and unicast packet storm control parameters
	<b>mc_dlf</b>	Configure multicast and unicast packet storm control parameters
	<b>bc_mc_dlf</b>	Configure broadcast multicast and unicast packet storm control parameters
	<b>level</b>	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** [<interface-type> <interface-id>] **storm-control**

<b>Syntax Description</b>	<b>show</b>	Display configuration/status information
	<b>interface</b>	Display interface information
	interface-type	The Ethernet type
	interface-id	The slot number/port number
	<b>storm-control</b>	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-lists <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-lists <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-lists &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-lists &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-lists &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-lists &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-lists &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-lists &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-lists &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-lists &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>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-lists <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  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; no ip access-list &lt;short(1-16)&gt; show ip access-lists &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-lists <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-lists <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-lists <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>	IP Access-list Configuration Mode	
<b>Usage Guidelines</b>		
<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-lists &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-lists &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-lists <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-lists <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</pre> <pre>moxa(config-mac-acl)# permit any any vlan 2 cos 1</pre> <pre>moxa(config-mac-acl)# permit any any redirect interface ethernet 1/1</pre> <pre>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;</pre> <pre>no ip access-list &lt;short(1-16)&gt;</pre> <pre>show ip access-lists &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-lists &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-lists &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: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-lists &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
	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 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-lists <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:ff:00 00:90:e8:00:00:33 ff: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-lists <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-lists <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>	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	
<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-lists <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>	moxa(config-mac-acl)# rule 9 enable moxa(config-mac-acl)# rule 9 disable	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	show ip access-lists <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-lists <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>	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)# 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-lists**

<b>Syntax Description</b>	<b>show</b>	Display configuration/status information
	<b>access-lists</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-lists  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
<b>Error Messages</b>	N/A
<b>Related Commands</b>	ip access-list <short(1-16)> mac access-list <short(1-16)>

## Show All IPv4 Access-lists

### Commands

#### show ip access-lists

<b>Syntax Description</b>	<b>show</b>	Display configuration/status information
	<b>ip</b>	Display IP related information
	<b>access-lists</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	

	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
<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-lists** <access-list-number>

<b>Syntax Description</b>	<b>show</b>	Display configuration/status information
	<b>ip</b>	Display IP related information
	<b>access-lists</b>	Configure ACL related parameters
	access-list-number	ACL index to display. Ranges from 1 to 16.
<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-lists 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-lists** <access-list-index>

<b>Syntax Description</b>	<b>show</b>	Display configuration/status information
	<b>mac</b>	Display MAC related information
	<b>access-lists</b>	Configure ACL related parameters
	access-list-index	ACL index to display. Ranges from 1 to 16.
<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-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  -----</pre>	

	<pre> 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 Destination MAC Address : any Cos                  : any Action               : None ----- </pre>
<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-lists** <short(1-16)>

<b>Syntax Description</b>	<b>show</b>	Display configuration/status information
	<b>mac</b>	Display MAC related information
	<b>access-lists</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 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 ----- </pre>	
<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>	moxa# show loop-protect Loop Protection Status : Enabled Detection interval: : 1 sec																																																				
	<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
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																																																		
<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
	<b>enable</b>	Globally enable DHCP snooping
	<b>disable</b>	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
	<b>trust</b>	Set the DHCP snooping port status to trusted
	<b>untrust</b>	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** { **port-channel** <integer> | <interface-type> <interface-id> }

**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
	<b>port-channel</b>	Configure port channel parameters
	integer	Specify the integer value, must be valid port-channel ID
	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>	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
	<b>interface</b>	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
	<b>binding</b>	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>	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	
<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]

**no login authentication**

<b>Syntax Description</b>	<b>login</b>	Configure login parameters
	<b>authentication</b>	Configure authentication parameters
	<b>radius</b>	Configure RADIUS authentication servers
	<b>tacacs</b>	Configure a TACACS authentication system
	<b>local</b>	Configure a local authentication database
<b>Defaults</b>	Default is local.	
<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 | mschapv2 } { 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
	<b>auth-port</b>	Configures the UDP destination port for authentication requests
	<b>timeout</b>	Configure time period (in seconds) until which a client waits for a response from the server before re-transmitting the request
	<b>retransmit</b>	Configure the maximum number of attempts the client undertakes to contact the server
	<b>key</b>	Configure the RADIUS server encryption key
	<b>authtype</b>	Configure the authentication type of the RADIUS server
	<b>primary</b>	Set as the primary server
	<b>secondary</b>	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** | **ascii** } { **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
	<b>host</b>	Configure TACACS host parameters
	<b>auth-port</b>	Configure authentication port parameters
	<b>timeout</b>	Configure timeout parameters
	<b>retransmit</b>	Configure the maximum number of attempts the client undertakes to contact the server
	<b>key</b>	Configure the per-server encryption key
	<b>authtype</b>	Configure the authentication type of the TACACS server
	<b>primary</b>	Set as the primary server
	<b>secondary</b>	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 [statistics] | CPU [statistics]}

<b>Syntax Description</b>	<b>show</b>	Display the statistics information
	<b>env</b>	Display switch information
	<b>all</b>	Show the current information for all resources such as CPU, RAM, and power
	<b>power</b>	Show the current power input information
	<b>RAM</b>	Show the current RAM information
	<b>statistics</b>	Show the statistics
	<b>CPU</b>	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	

#### Export a Resource Log File

##### Commands

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

<b>Syntax Description</b>	<b>copy</b>	Copy the target file or input
	<b>resource-log</b>	Export the system resource log
	tftp_url	Specify the address of the remote TFTP server and target filename in the format "tftp://server/filename"
	sftp_url	Specify 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 resource-log tftp://192.168.127.100/resource-log.zip Export success	
<b>Error Messages</b>	% Permission Denied % File not Found % Server not Connected	
<b>Related Commands</b>	N/A	

## Statistics

### Show Traffic Statistics

#### Commands

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

<b>Syntax Description</b>	<b>show</b>	Display configuration/status information
	<b>statistics</b>	Display the interface statistics table
	<b>interface</b>	Configure the interface
	<b>port-channel</b>	The port channel
	integer	Integer value, should be valid port-channel ID
	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** [ **interfaces** {**port-channel** <integer> | <interface-type> <interface-id>}]

<b>Syntax Description</b>	<b>clear</b>	Clear input
	<b>statistics</b>	Clear statistics
	<b>interfaces</b>	Specify which interface will be applied to this command
	<b>port-channel</b>	The port channel interface
	integer	The port channel ID
	interface-type	The Ethernet interface type
	interface-id	The interface ID: slot number/port number
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC Mode.	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# clear statistics interfaces Ethernet 1/1	
<b>Error messages</b>	N/A	
<b>Related commands</b>	show statistics	

# 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
	<b>general-event</b>	Show general event notification settings
	<b>poe-event</b>	Show PoE event notification settings
	<b>port-event</b>	Show port event notification settings
	<b>switching-event</b>	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, 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 , </pre>	

	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
<b>Error Messages</b>	N/A
<b>Related Commands</b>	event-notification general-event event-notification poe-event event-notification port-event event-notification switching-event

## Configure General Event Notifications

### Commands

**event-notification general-event event\_type [action [trap] [email]]**

**no event-notification general-event event\_type [action [trap] [email]]**

<b>Syntax Description</b>	<b>no</b>	Disables the configuration / deletes the entry / resets to default value	
	<b>event-notification</b>	Event notification related configuration	
	<b>general-event</b>	Set notification for general event	
	<b>event_type</b>	<b>account-setting-changed</b>	User account changed, including create account, remove account, and change of username, permission.
		<b>all</b>	Set all general event
		<b>cold-start</b>	System cold started
		<b>config-change</b>	System config changed
		<b>config-import</b>	System config imported
		<b>log-capacity</b>	System log meets capacity threshold
		<b>login-fail</b>	User login failed
		<b>login-lockout</b>	User login lockout due to login policy
		<b>login-success</b>	User login succeeded
		<b>password-changed</b>	User account password changed.
		<b>power-off</b>	Power supply off
		<b>power-on</b>	Power supply on
	<b>ssl-certificated-changed</b>	System certification changed	
<b>warm-start</b>	System warm started		
<b>action</b>	Set action for event notification		
<b>trap</b>	Set trap action for notification		
<b>email</b>	Set email action for notification		
<b>Defaults</b>	All configuration about trap, email, event, and all events are enabled		
<b>Command Modes</b>	Global configuration		
<b>Usage Guidelines</b>	N/A		
<b>Examples</b>	<pre>moxa# config moxa(config)# event-notification general-event all action trap moxa(config)# no event-notification general-event all action trap email</pre>		
<b>Error Messages</b>			
<b>Related Commands</b>	<pre>show event-notification event-notification poe-event event-notification port-event event-notification switching-event</pre>		

## Configure PoE Event Notifications

### Commands

**event-notification poe-event event\_type [action [trap] [email]]**

**no event-notification poe-event event\_type [action [trap] [email]]**

<b>Syntax Description</b>	<b>no</b>	Disables the configuration / deletes the entry / resets to default value	
	<b>event-notification</b>	Event notification related configuration	
	<b>poe-event</b>	Set notification for poe event	
	<b>event_type</b>	<b>all</b>	Set all poe event
		<b>pd-power-on</b>	Power device power on
		<b>pd-power-off</b>	Power device power off
		<b>low-input-voltage</b>	Low input voltage from power sourcing equipment
		<b>pd-over-current</b>	The current exceeds the limit
		<b>pd-no-response</b>	Device does not receive the response from power device
		<b>over-power-budget-limit</b>	Power device power consumption exceeds the budget
		<b>power-detection-failure</b>	Power device detection failure
	<b>over-module-budget-limit</b>	Device power consumption exceeds module budget limit	
<b>action</b>	Set action for event notification		
<b>trap</b>	Set trap action for notification		
<b>email</b>	Set email action for notification		
<b>Defaults</b>	All configuration about trap, email, event, and all events are enabled		
<b>Command Modes</b>	Global configuration		
<b>Usage Guidelines</b>	N/A		
<b>Examples</b>	<pre>moxa# config moxa(config)# event-notification poe-event all action trap moxa(config)# no event-notification poe-event all action trap email</pre>		
<b>Error Messages</b>			
<b>Related Commands</b>	<pre>show event-notification event-notification general-event event-notification port-event event-notification switching-event</pre>		

## Configure Port Event Notifications

### Commands

**event-notification port-event event\_type [action [trap] [email]]**

**no event-notification port-event event\_type [action [trap] [email]]**

<b>Syntax Description</b>	<b>No</b>	Disables the configuration / deletes the entry / resets to default value	
	<b>event-notification</b>	Event notification related configuration	
	<b>port-event</b>	Set notification for port event	
	<b>event_type</b>	<b>all</b>	Set all port event
		<b>port-link-up</b>	Port link up
		<b>port-link-down</b>	Port link down
		<b>port-shutdown-by-rate-limit</b>	Port shutdown by rate limit
		<b>port-recovery-by-rate-limit</b>	Port recovery by rate limit
		<b>port-shutdown-by-port-security</b>	Port shutdown by port security
		<b>port-shutdown-by-loop-protect</b>	Port shutdown by loop protection
	<b>action</b>	Set action for event notification	
<b>trap</b>	Set trap action for notification		
<b>email</b>	Set email action for notification		
<b>Defaults</b>	All configuration about trap, email, event, and all events are enabled. Port events of all ports are enabled.		
<b>Command Modes</b>	Global configuration		
<b>Usage Guidelines</b>	N/A		
<b>Examples</b>	<pre>moxa# config moxa(config)# event-notification port-event all action trap moxa(config)# no event-notification port-event all action trap email moxa (config-if)# event-notification port-event all</pre>		
<b>Error Messages</b>			
<b>Related Commands</b>	<pre>show event-notification event-notification general-event event-notification poe-event event-notification switching-event</pre>		

## Configure Switching Event Notifications

### Commands

**event-notification switching-event event\_type [action [trap] [email]]**

**no event-notification switching-event event\_type [action [trap] [email]]**

<b>Syntax Description</b>	<b>No</b>	Disables the configuration / deletes the entry / resets to default value
	<b>event-notification</b>	Event notification related configuration
<b>Syntax Description</b>	<b>switching-event</b>	Set notification for switching event
	<b>event_type</b>	<b>all</b> Set all switching event
		<b>topology-changed</b> Network topology changed (MRP/turbo chain/Turbo Ring)
		<b>coupling-changed</b> Turbo Ring v2 coupling changed
		<b>master-changed</b> Turbo Ring v2 master changed
		<b>master-mismatched</b> Turbo Ring v2 master mismatched
		<b>rstp-topology-changed</b> RSTP network topology changed
		<b>rstp-root-changed</b> RSTP root device changed
		<b>rstp-migration</b> RSTP migration
		<b>rstp-invalid-bpdu</b> RSTP device receive invalid bpdu
		<b>rstp-new-port-role</b> RSTP port role changed
		<b>rdnt-port-health-check-fail</b> Redundant port health check failed
		<b>dot1x-auth-fail</b> 802.1x authentication fail
		<b>lldp-table-changed</b> LLDP remote table changed
		<b>rmon-raising-alarm</b> Rmon alarm variables values reach or exceed the rising threshold
		<b>rmon-falling-alarm</b> Rmon alarm variables values reach or fall below the falling threshold
		<b>mstp-new-port-role</b> MSTP port role changed
		<b>mstp-root-changed</b> MSTP root device changed
		<b>mstp-topology-changed</b> MSTP network topology changed
		<b>dhcpsnp-client-discarded</b> DHCP client ingress discards packets due to the DHCP Snooping rule
		<b>dhcpsnp-entry-set-fail</b> Binding Status dynamic entry set failed
	<b>dhcpsnp-server-discarded</b> DHCP server discards packets due to the DHCP Snooping rule	
	<b>macsec-mka-fail</b> MACsec mka peer expired	
	<b>MRP multi managers</b> MRP multiple managers	
	<b>MRP Ring-Open</b> MRP ring open	
	<b>action</b> Set action for event notification	
	<b>trap</b> Set trap action for notification	
	<b>email</b> Set email action for notification	
<b>Defaults</b>	All configuration about trap, email, event enable of all events are enabled	
<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>		
<b>Related Commands</b>	<pre>show event-notification event-notification general-event event-notification poe-event event-notification port-event</pre>	

## 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
	<b>server-port</b>	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
	<b>ipv4</b>	Configure IPv4 parameters
	ucast_addr	The syslog server IP address
	dns_host_name	The syslog server host domain name
	<b>port</b>	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)> [**enable**]

<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
	<b>enable</b>	Enable the syslog server
	<b>disable</b>	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** {<tftp\_url> | <sftp\_url>} **client-certificate** {<tftp\_url> | <sftp\_url>} **client-key** {<tftp\_url> | <sftp\_url>} **ca-key**

<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>	<pre>moxa# copy syslog-server tftp://192.168.127.200/filename1 client-certificate tftp://192.168.127.200/filename2 client-key tftp://192.168.127.200/filename3 ca-key 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</pre>	
<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
	<b>disable</b>	Disable authentication
	<b>tls</b>	Use TLS authentication
<b>Defaults</b>	Disabled	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<pre>moxa(config)# logging-server 1 authentication tls moxa(config)# logging-server 2 authentication disable</pre>	
<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	

## Specify Syslog Format

### Commands

**logging-format rfc5424**

<b>Syntax Description</b>	<b>logging-format</b>	Syslog format
	<b>rfc5424</b>	Syslog format with RFC5424
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# logging-format rfc5424	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	<b>show logging server</b>	

## Clear Syslog Format

### Commands

**no logging-format**

<b>Syntax Description</b>	<b>no</b>	Remove configuration / delete entry / reset to default value
	<b>logging-format</b>	Set to default syslog format
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# no logging-format	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	<b>show logging server</b>	

## Set Syslog Message Format

### Commands

**logging-format message CEF**

<b>Syntax Description</b>	<b>logging-format</b>	Syslog format
	<b>message</b>	Set syslog message format
	<b>CEF</b>	Set syslog message format with CEF
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# logging-format message CEF	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	<b>show logging server</b>	

## Clear Syslog Message Format

### Commands

**no logging-format message**

<b>Syntax Description</b>	<b>no</b>	Remove configuration / delete entry / reset to default value
	<b>logging-format</b>	Set to default syslog format
	<b>message</b>	Set to default syslog message format
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global Configuration	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# no logging-format message	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	<b>show logging server</b>	

# 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 [detail]**

<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>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 interface information.	
<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  Chassis Id SubType      : Mac Address Chassis Id              : 00:90:e8:10:20:30 Port Id SubType         : Local Port Id                 : 1 Port Description        : 1000TX,RJ45. System Name             : -- System Desc             : EDS-G512E Local Intf              : Eth1/3 Time Remaining         : 19 Seconds System Capabilities Supported : B System Capabilities Enabled  : B Management Addresses   : IfId SubType Address           : OID</pre>	
<b>Error Messages</b>	N/A	

## Show LLDP Local Information

### Commands

**show lldp local**

<b>Syntax Description</b>	<b>show</b>	Display configuration/statistics/general information
	<b>lldp</b>	Display LLDP information
	<b>local</b>	Display local LLDP information
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC User EXEC	
<b>Usage Guidelines</b>	Display LLDP local device related information.	
<b>Examples</b>	<pre>moxb# show lldp local  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              : 00:01:02:03:04:05 System Name             : moxb System Description      : EDS-G4012-8P-4QGS Product Revision: V0.0.0 FW Version: V4.0 System Capabilities Supported : B System Capabilities Enabled  : B</pre>	

	Management Address : Interface Management Address ----- 129 192.168.127.253  Eth1/1 : Port Id SubType : Interface Alias Port Id : Eth1/1 Port Description : Ethernet Interface Port 01 Enabled Tx TLvs : Port Description, System Name, System Capability, Management Address, CIP Identification  Extended 802.3 TLV Info -MAC PHY Configuration & Status Auto-Neg Support & Status : Not Supported, Disabled Advertised Capability Bits : 0000 Operational MAU Type : 0 -Link Aggregation Capability & Status : Not Capable, Not In Aggregation Aggregated Port Id : 0 -Maximum Frame Size : 9216  Extended 802.1 TLV Info -Port VLAN Id : 1 -Vlan Name Vlan Id Vlan Name TxStatus ----- 1 Disabled  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
<b>Error Messages</b>	N/A

## 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 errors

<b>Syntax Description</b>	<b>show</b>	Display configuration/statistics/general information
	<b>lldp</b>	Configure LLDP information
	<b>errors</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 | 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)>

**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. tx_delay <= (0.25 x transmit-interval)	
<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
	<b>chassis-comp</b>	Specify the value of the entPhysicalAlias object of a chassis component as the chassis identifier
	<b>if-alias</b>	Specify the value of ifAlias of an interface on the containing chassis as the chassis identifier
	<b>port-comp</b>	Specify the value of the entPhysicalAlias object of a port or backplane within the chassis as the chassis identifier
	<b>mac-addr</b>	Specify the unicast source MAC address of a port on the chassis as the chassis identifier
	<b>nw-addr</b>	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.
	<b>if-name</b>	Specify the value of an ifName pbject of an interface on the containing chassis as the chassis identifier
	<b>local</b>	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
	<b>transmit</b>	Enable the transmission of LLDPDU from one of the ports of the server to the LLDP module
	<b>receive</b>	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
	<b>if-alias</b>	Specify the value of ifAlias of an interface on the containing chassis as the port identifier
	<b>port-comp</b>	Specify the value of the entPhysicalAlias object of a port or backplane within the chassis as the port identifier
	<b>mac-addr</b>	Specify the unicast source MAC address of a port on the chassis as the port identifier
	<b>if-name</b>	Specify the value of an ifName pbject of an interface on the containing chassis as the port identifier
	<b>local</b>	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 Interface 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 }

**no 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
	<b>port-descr</b>	Use a port description for the TLV.
	<b>sys-name</b>	Use the system name for the TLV.
	<b>sys-descr</b>	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
	<b>enable</b>	Enable mirroring
	<b>disable</b>	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
	<b>session</b>	Display the mirroring information of a specific mirroring session
	session-id	Specify the index of the mirroring session
	<b>range</b>	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
	<b>source</b>	Configure the mirroring source port
	<b>interface</b>	Configure the interface
	<b>port-channel</b>	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
	<b>source</b>	Configure the mirroring source port
	<b>interface</b>	Configure the interface
	<b>port-channel</b>	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
	<b>destination</b>	Configure the mirroring destination port
	<b>interface</b>	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>	moxa# configure moxa(config)# monitor session 1 destination 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. % Invalid: If the port is set as the Dual Homing redundant port, it cannot be set to the destination port. % Invalid: If the port is set as the MSTP port, it cannot be set to the destination port. % Invalid: If the port is set as the MRP port, it cannot be set to the destination port. % Invalid: If Dot1x is enabled on this port, it cannot be set to the destination port. % Invalid: The RSPAN destination session cannot be active with the Reflect Port Mode enabled. % Invalid: There is more than one destination port. % Invalid: The source port of the SPAN session with the Reflect Port Mode enabled must be a VLAN access port. % Invalid: The reflect port cannot be configured to the Management VLAN ID. % 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. % Invalid: The RSPAN VLAN ID of an RSPAN session conflicts with the PVID of the reflect port in another session. % Invalid: When GVRP is enabled, the Reflect Port Mode cannot be enabled or the RSPAN session cannot be active. % Invalid: The destination port must be a VLAN access port. % Invalid: The Speed/Duplex settings of the reflect port must be in AUTO mode and enabled. % Invalid: Invalid RSPAN session type	
<b>Related Commands</b>	moxa-product(config)# no monitor session <session-id (1-7)> destination { interface <interface-type> <interface-id> } [reflect-port-mode]	

## 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
	<b>destination</b>	Configure the mirroring destination port
	<b>interface</b>	Configure the interface
	interface-type	Specify the interface type
	interface-id	Specify the interface number
	<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>	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
	<b>range</b>	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
	<b>interface</b>	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>	<ul style="list-style-type: none"> <li>% Invalid: The RSPAN VLAN ID cannot be configured to the Management VLAN ID.</li> <li>% Invalid: The RSPAN VLAN ID must be configured to an existing VLAN ID.</li> <li>% Invalid: Duplicated RSPAN VLAN ID.</li> <li>% Invalid: The RSPAN session cannot be active when the RSPAN Intermediate Role is enabled.</li> <li>% Invalid: The RSPAN destination session cannot be active with the Reflect Port Mode enabled.</li> <li>% Invalid: There is more than one RSPAN source session.</li> <li>% Invalid: There is more than one RSPAN destination session.</li> <li>% 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.</li> <li>% Invalid: The RSPAN VLAN ID of an RSPAN session conflicts with the PVID of the reflect port in another session.</li> <li>% Invalid: When GVRP is enabled, the Reflect Port Mode cannot be enabled or the RSPAN session cannot be active.</li> <li>% Invalid: When the RSPAN destination session is active, at least one VLAN trunk port must be enabled.</li> </ul>	
<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
	<b>enable</b>	Enable the RSPAN intermediate role
	<b>disable</b>	Disable the RSPAN intermediate role
	<b>vlan</b>	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> <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>	
<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
	host	The IP address or domain name of the node to be pinged
	<b>repeat</b>	The number of ping packets that are sent to the destination address
	repeat-count	The repeat value. Ranges from 1 to 10.
	<b>size</b>	The size of the ping packet
	payload-size	The length of the ping packet value. Ranges from 36 to 2080.
	<b>timeout</b>	The time in seconds after which the entity waiting for the ping response times out
request-timeout	The timeout value. Ranges from 1 to 100.	
<b>Defaults</b>	N/A	
<b>Command Modes</b>	User EXEC Privileged EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	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	
<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** **oversize-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
	<b>overwrite-oldest</b>	Overwrite the oldest entry
	<b>stop-recording</b>	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 oversize-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> | <usb\_file> | <micro-sd\_file> }

<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"
	usb_file	Copy event-log to ABC-02. The USB storage and filename in the format: <b>"usb:filename"</b>
micro-sd_file	Copy event-log to micro-SD. The Micro SD storage and filename in the format: <b>"micro-sd:filename"</b>	
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	(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	
<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	

## Configure Auto Backup Log Settings

### Commands

**auto-backup log** { **enable** | **disable** }

<b>Syntax Description</b>	<b>auto-backup</b>	Configure auto backup of files to external storage
	<b>log</b>	Configure auto backup for log files
	<b>enable</b>	Enable auto backup for log files
	<b>disable</b>	Disable auto backup for log files
<b>Defaults</b>	N/A	

<b>Command Modes</b>	Privileged EXEC
<b>Usage Guidelines</b>	Use the auto-backup log privileged command on the device to automatically back up the oldest 1000 log entries to prevent logs from being overwritten.
<b>Examples</b>	(config)# auto-backup log enable (config)# auto-backup log disable
<b>Error messages</b>	N/A
<b>Related commands</b>	show external-storage info auto-backup config

# 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>:<password>@server/filename }

**mms t-profile certificate export** { tftp://server/filename | sftp://<user-name>:<password>@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>:<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 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 [all]

<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>all</b>	Reset all user data including the startup configuration, log files, certificates, and keys to their factory default value
<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...  moxa# reload factory-default all  Are you sure you want to reset the system configuration and all user data including configuration, log files, and credential keys to the factory default settings? [Y/N]  Resetting device into factory default and restarting...	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Reload the Custom-default Configuration

Use the **reload custom-default** privileged EXEC command to restore the custom default configuration and reboot the device.

### Commands

#### reload custom-default

<b>Syntax Description</b>	<b>reload</b>	Perform a warm restart
	<b>custom-default</b>	Perform a warm restart and reload the custom default settings
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# reload custom-default Would you like to reset system configuration to the custom default? [y/N] Resetting device to the custom default and restarting...	
<b>Error Messages</b>	% Invalid: The specified custom default configuration does not exist.	
<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>	moxa# tech-support system enable Warning! The Telnet/HTTP service will be disabled. Account Name: moxasupport Account Password: nZParGhefA	
<b>Error messages</b>	"% Error! tech-support system hasn't yet been enabled." "% Account: Invalid: Max user account amount reached."	
<b>Warning messages</b>	"Warning! The Telnet/HTTP service will be disabled." "Please save config to eliminate the account, moxasupport, from the system."	
<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>	moxa# tech-support system login CLI console locked Enter Password to unlock the console: #	
<b>Error messages</b>	"% Error! tech-support system hasn't yet been enabled."	
<b>Warning messages</b>	N/A	
<b>Related commands</b>	tech-support system enable	

## 4. Supplementary Information

The table below lists known issues or limitations related to the CLI commands in this version.

Item	CLI	Descriptions
S-1	<pre> Moxa# debug debuglog clear Moxa# debug debuglog export usb { all   os   framework   package   hw } Moxa# debug terminal Moxa# debug trace media { local   usb_storage   usb_console } Moxa# debug trace system dump chip-mac-table Moxa# debug trace tc dump information Moxa# debug trace trv2 dump information Moxa# debug trace trv2 severity &lt;value(0-7)&gt; Moxa# debug trace { start   stop } Moxa# debug { start   stop } Moxa# clear debug destination { ram   file } Moxa# show debug destination file Moxa# show debug destination ram Moxa# show debug module config_layer Moxa# show debug module dai Moxa# show debug module dhcprly Moxa# show debug module dhcpsnp Moxa# show debug module file_layer Moxa# show debug module firmware_update Moxa# show debug module global Moxa# show debug module ipsg Moxa# show debug module management_ip Moxa# show debug module mrp Moxa# show debug module port-mirror Moxa# show debug module status_layer Moxa# show vlan device capabilities </pre>	<p>While these commands may be visible in the terminal, it's important to note that they are strictly reserved for internal use by Moxa.</p>
S-2	<pre> moxa(config)# debug burst moxa(config)# debug burst period &lt;integer(1-10)&gt; moxa(config)# debug burst threshold &lt;integer(1-100)&gt; moxa(config)# debug destination console moxa(config)# debug destination file moxa(config)# debug destination file size &lt;integer(1-10)&gt; moxa(config)# debug destination ram moxa(config)# debug destination ram size &lt;integer(1-10)&gt; moxa(config)# debug level config_layer moxa(config)# debug level dai moxa(config)# debug level dhcprly moxa(config)# debug level dhcpsnp moxa(config)# debug level file_layer moxa(config)# debug level firmware_update moxa(config)# debug level global moxa(config)# debug level ipsg moxa(config)# debug level management_ip moxa(config)# debug level mrp moxa(config)# debug level port-mirror moxa(config)# debug level status_layer moxa(config)# debug module config_layer moxa(config)# debug module dai moxa(config)# debug module dai showRule moxa(config)# debug module dhcprly moxa(config)# debug module dhcprly packet [{relay   discard   op82}] moxa(config)# debug module dhcpsnp </pre>	<p>While these commands may be visible in the terminal, it's important to note that they are strictly reserved for internal use by Moxa.</p>

<pre>moxa(config)# debug module dhcpsnp packet [{forward   discard}] moxa(config)# debug module file_layer moxa(config)# debug module file_layer {main   operation} moxa(config)# debug module firmware_update moxa(config)# debug module firmware_update main moxa(config)# debug module ipsg moxa(config)# debug module ipsg showRule moxa(config)# debug module management_ip moxa(config)# debug module management_ip main moxa(config)# debug module mrp moxa(config)# debug module mrp statechange moxa(config)# debug module port-mirror moxa(config)# debug module port-mirror mirrSetting moxa(config)# debug module status_layer moxa(config)# debug module status_layer main moxa(config)# debug system startup</pre>	
--	--