

# Moxa Managed Switch Next-generation OS (v4.x) Layer 3 Command Line Interface

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**Version 1.0, June 2023**

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

**Models covered by this user manual:**

MDS-G4000-L3-4XGS Series Managed Ethernet Switches

MDS-G4000-L3 Series Managed Ethernet Switches

RKS-G4000 Series Managed Ethernet Switches (L3 Models)



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# **Moxa Managed Switch Next-generation OS (v3.x) Layer 3 Command Line Interface**

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# 1. About This Manual

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This manual describes how to use the command line to configure Moxa's layer 3 managed Ethernet switches. Both the web interface configuration utility and command line interface help system administrators easily and quickly manage, monitor, and configure Moxa's managed Ethernet switch.

## 2. Understanding the Command Line Interface

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This chapter helps users understand the command line interface by giving a general overall introduction to the command line operations.

### 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.

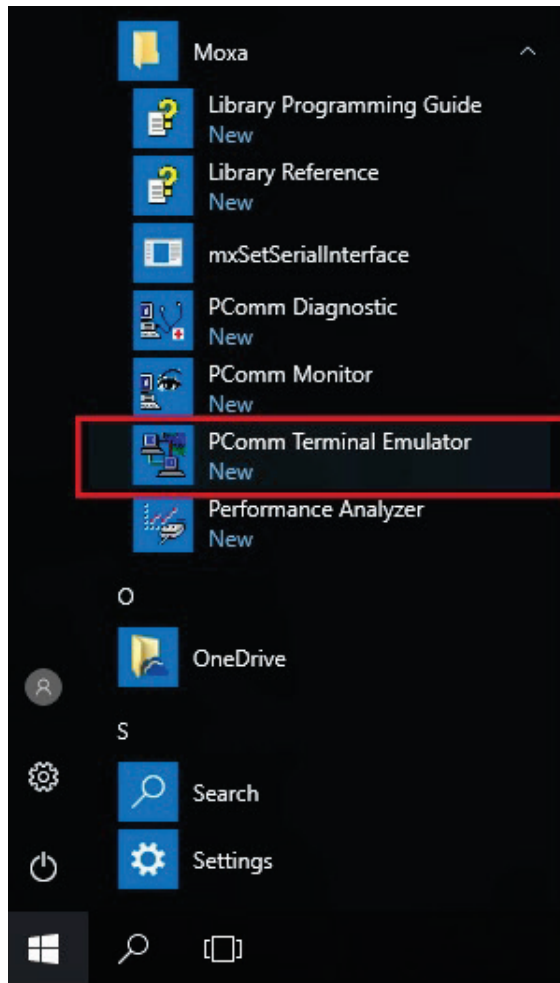


#### NOTE

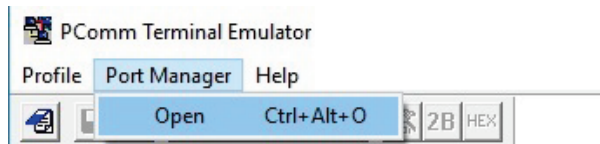
Moxa recommends using PComm Terminal Emulator for serial communication. This software is available for free on the Moxa website. You can use other serial communication software, but the following instructions may be different.

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.

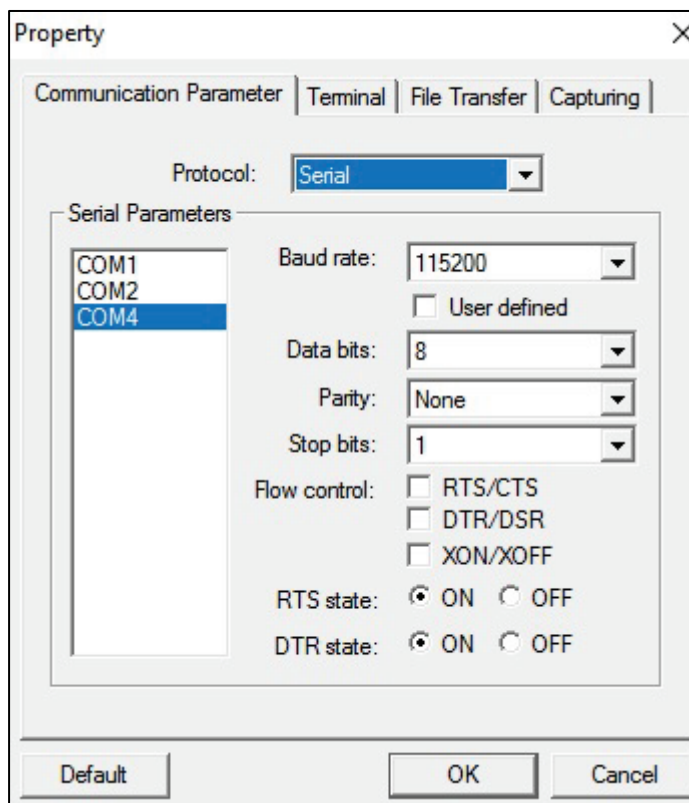
4. In Windows, click **Start > Moxa > PComm Terminal Emulator**.



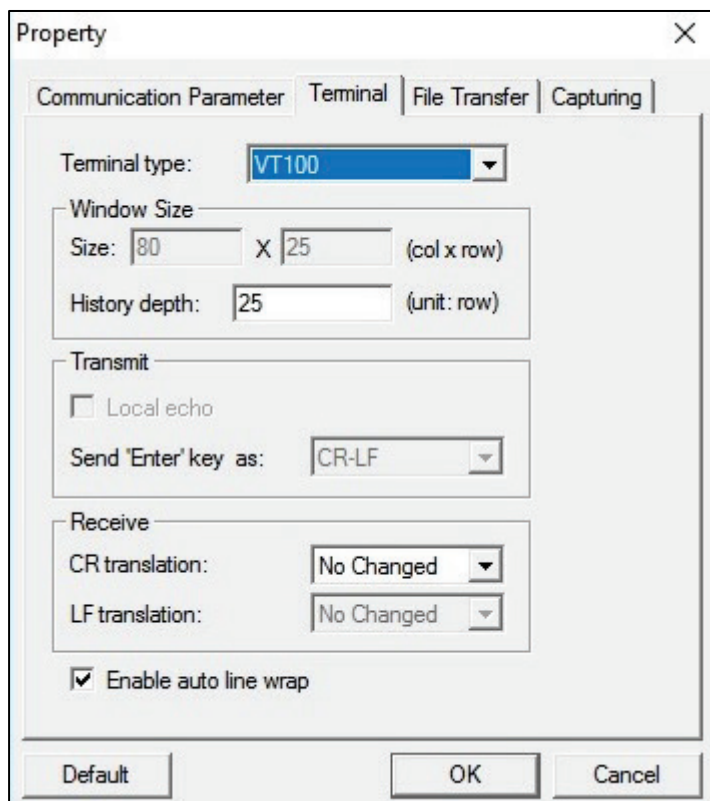
5. Click **Port Manager > Open** to establish a new connection.  
The Property window will appear.



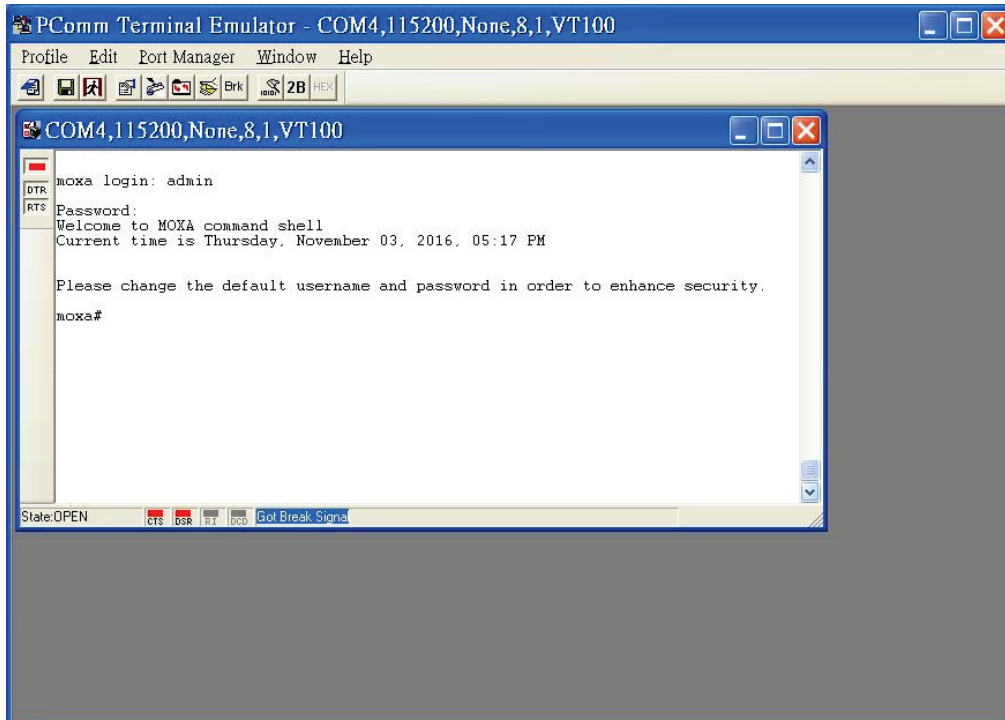
- On the **Communication Parameter** tab, select the COM port that will be used for the console connection. Configure the fields as follows: **115200** for **Baud rate**, **8** for **Data bits**, **None** for **Parity**, and **1** for **Stop bits**.



- 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.



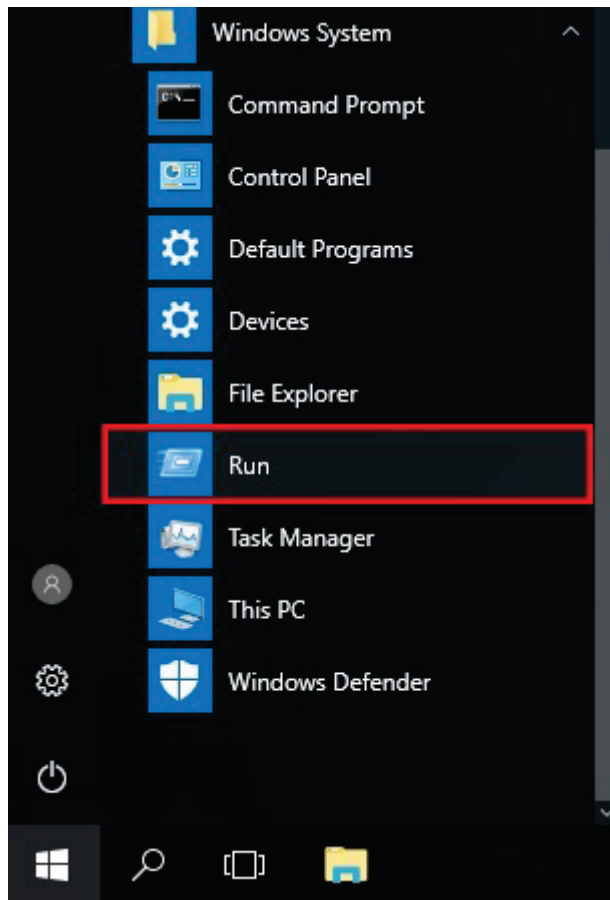
## NOTE

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

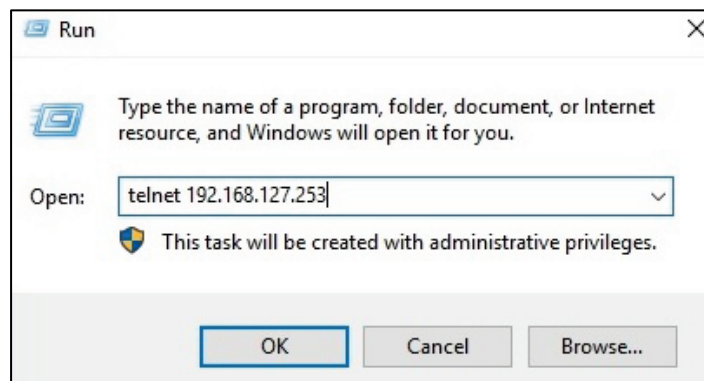


After making sure that the Moxa switch is connected to the same LAN and logical subnet as your PC, open the Moxa switch's Telnet console as follows:

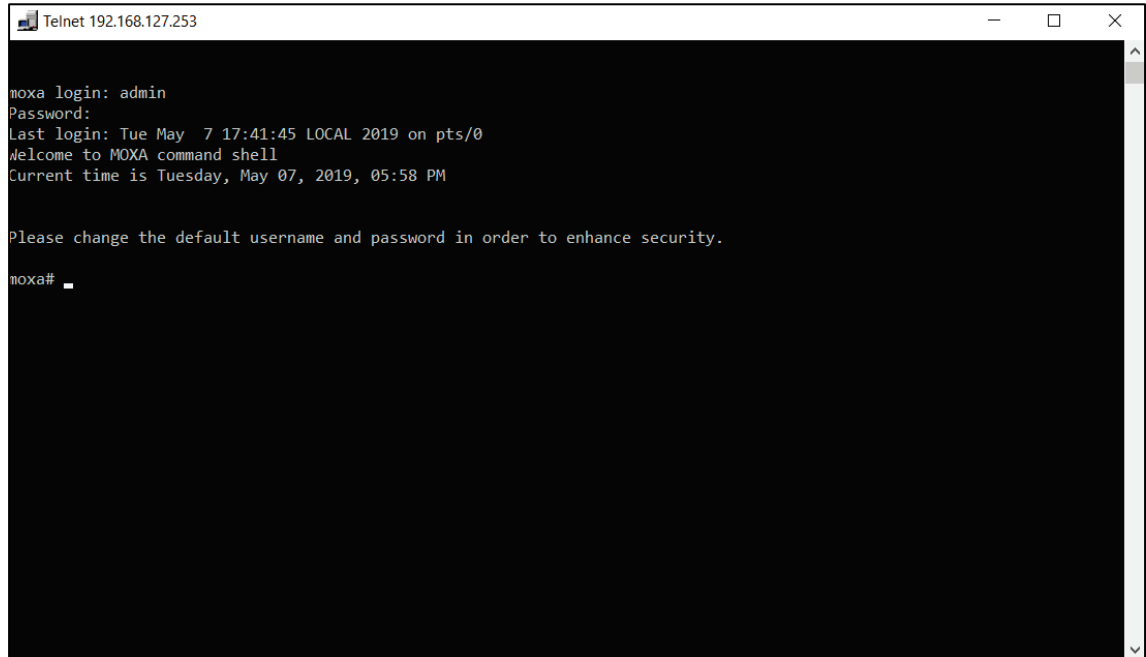
1. In Windows, click **Start > Run**.



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



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



```
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#
```

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



## NOTE

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

# Command Modes

## Basic Configuration

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

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

```
moxa# ?
clear          Clear the key pair
cli           Configure the CLI display parameters
configure     Enter configuration mode
copy         Perform copy operation
debug        Configures trace for the protocol
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
remove       Remove an online account
show        Display configuration / statistics / general
              information
tech-support Trouble-shooting purpose
moxa#
```

## Understanding All Command Modes

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

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

Refer to the following example of changing configuration modes below.

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

```
moxa#  
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 enclose the command in quotation marks (`"`), as shown below.

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

! -----
! Time: 2019-05-07 18:01:08
! Model name: MDS-G4020-L3
! Firmware version: v1.9.6 Build 2020_1230_0945
! Product revision: V1.0.0
! IP address: 192.168.127.253
! MAC address: 00:90:E8:7A:02:2C
! Serial number: TAICB1122978
! Module M2 product revision: None
! Module M3 product revision: None
! Module M4 product revision: None
! Module M5 product revision: None
! -----
configure terminal
session timeout 0
contact "test#"
ip telnet server enable
snmp-server access enable
interface ethernet 1/1
qos scheduler-type wrp
spanning-tree bpduguard
spanning-tree bpdufilter
switchport mode trunk
gvrp
switchport acceptable-frame-type all
```

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)#
```

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 displayed, as shown below.

```
moxa# c?
clear
cli
configure
copy

moxa# c_
```

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 customer-key
clear debug destination { ram | file }
clear ip arp
clear logging event-log
clear screen
clear spanning-tree detected protocols interface { <interface-type> <interface-id> | port-channel <integer> }
clear statistics [interfaces {port-channel <integer> | <interface-type> <interface-id> }]
clear syslog-server certificate-and-key
cli eth-index-naming { modular | non-modular }
cli pagination turn {on | off}
configure [ terminal ]
copy customer-key {tftp://server/filename | sftp://<user-name>:<pass-word>@server/filename} private {tftp://server/fil
ename | sftp://<user-name>:<pass-word>@server/filename} certificate label <string (16)>
copy debug destination file {tftp://server/filename | sftp://<user-name>:<pass-word>@server/filename}
copy debug destination ram {tftp://server/filename | sftp://<user-name>:<pass-word>@server/filename}
copy event-log {tftp://server/filename | sftp://<user-name>:<pass-word>@server/filename}
copy running-config startup-config
copy running-config {tftp://server/filename | sftp://<user-name>:<pass-word>@server/filename} [included-default] [pass
word <string(60)>]
copy startup-config {tftp://server/filename | sftp://<user-name>:<pass-word>@server/filename} [included-default] [pass
word <string(60)>]
copy syslog-server {tftp://server/filename | sftp://<user-name>:<pass-word>@server/filename} client-certificate {tftp:
//server/filename | sftp://<user-name>:<pass-word>@server/filename} client-key {tftp://server/filename | sftp://<user-na
me>:<pass-word>@server/filename} ca-key
copy { tftp://server/filename running-config | sftp://<user-name>:<pass-word>@server/filename running-config } [passwo
```

## 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
debug                  Debugging information
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
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
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
receiver               Configure receiver related parameters
rmon                   Configure RMON configuration
snmp-server            Configure snmp-server parameters
snmp-trap              Configure snmp-trap parameters
spanning-tree          Configure the related spanning tree parameters
tacacs-server          Configure TACACS server related parameters
trusted-access         Configure IP trusted access parameters
```

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

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

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

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

## CLI Error Messages

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

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

## Command History

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

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

# 3. Commands

This chapter covers all layer 3 function commands that can be used to configure Moxa's layer 3 managed Ethernet switches.

## Layer 3 Routing

### Static Route

#### Create/Delete the Static Route Entry

##### Commands

**ip route** <prefix> <mask> {<next-hop> [<distance (1-255)>] | vlan <vlan-id> [<distance (1-255)>] [next-hop] }

**no ip route** <prefix> <mask> {<next-hop> | vlan <vlan-id> [next-hop] }

<b>Syntax Description</b>	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>ip</b>	Global IPv4 configuration subcommands
	<b>route</b>	Static routing entry
	prefix	Address prefix
	mask	Subnet mask
	next-hop	Next hop address
	vlan	Specified VLAN ID
	distance	Distance metric
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# ip route 30.0.0.2 255.255.255.255 20.0.0.1 moxa(config)# ip route 30.1.1.0 255.255.255.0 vlan 1	
<b>Error Messages</b>	Invalid: Invalid IPv4 Address ipv4_config['ipAddress']/ ipv4_config['netmask'] Invalid: This IPv4 address overlaps with another Interface IPv4 address. Invalid: [data.I3VlanIfTable] must contain no more than 256 items. Invalid: The interface name is duplicated. Invalid: The interface does not exist. Invalid: The subnet mask should be 32 bits for the following interface 10.10.10.10/255.255.255.0 Invalid: IP address mismatch. Invalid: Loopback index. Invalid: The maximum number of routing entries to the same destination is 8. Please delete another routing entry to accommodate the new one.	
<b>Related Commands</b>	show ip route show ip route static	



## Display the Existing ARP Entry List

### Commands

**show ip arp**

<b>Syntax Description</b>	<b>show</b>	Display configuration/statistics/general/information
	<b>ip</b>	IP-related information
	<b>arp</b>	ARP related 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 ip arp IP Address      MAC Address      Interface ----- 192.168.127.95    00:19:cb:d6:db:b4    vlan1	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Flush the ARP Entries

### Commands

**clear ip arp**

<b>Syntax Description</b>	<b>clear</b>	Clear/flush the dynamically learnt arp entries
	<b>ip</b>	IP-related information
	<b>arp</b>	ARP cache entries
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# clear ip arp	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## IP Interface

### Configure the Interface Settings

#### Commands

**interface vlan** <vlanid>

**no interface vlan** <vlan\_id>

<b>Syntax Description</b>	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>interface</b>	Configure interface parameters
	<b>vlan</b>	VLAN interface
	vlanid	VLAN ID
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# interface vlan 10	
<b>Error Messages</b>	Invalid: Invalid IPv4 Address ipv4_config['ipAddress']/ ipv4_config['netmask'] Invalid: This IPv4 address overlaps with other Interface IPv4 address. Invalid: [data.l3VlanIfTable] must contain less than or equal to 256 items. Invalid: Interface name is duplicated. Invalid: No such interface.	
<b>Related Commands</b>	N/A	

## Configure Interface Alias Description

### Commands

**description** <string(63)>

**no description**

<b>Syntax Description</b>	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>description</b>	Set the mnemonic name of this interface
	<string(63)>	The specific mnemonic name for the interface
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Interface Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# interface 10 moxa(config-if)# description "Switch interface 10"	
<b>Error Messages</b>	Invalid: Invalid IPv4 Address ipv4_config['ipAddress']/ ipv4_config['netmask'] Invalid: This IPv4 address overlaps with other Interface IPv4 address. Invalid: [data.l3VlanIfTable] must contain less than or equal to 256 items. Invalid: Interface name is duplicated. Invalid: No such interface.	
<b>Related Commands</b>	N/A	

## Enable/Disable the Interface

### Commands

**shutdown**

**no shutdown**

<b>Syntax Description</b>	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>shutdown</b>	Shutdown the interface
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Interface Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# interface vlan 10 moxa(config-if)# shutdown	
<b>Error Messages</b>	Invalid: Invalid IPv4 Address ipv4_config['ipAddress']/ ipv4_config['netmask'] Invalid: This IPv4 address overlaps with other Interface IPv4 address. Invalid: [data.l3VlanIfTable] must contain less than or equal to 256 items. Invalid: Interface name is duplicated. Invalid: No such interface.	
<b>Related Commands</b>	N/A	

## Configure the IPv4 Address for the Interface

### Commands

**ip address** <ip-address> <subnet-mask>

**no ip address** <ip-address>

<b>Syntax Description</b>	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>ip address</b>	Configure the interface IPv4 address
	<ip-address>	IPv4 address string
	<subnet-mask>	Should be 255.255.255.255.
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Interface Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<pre>moxa(config)# interface vlan 10 moxa(config-if)# ip address 10.10.10.10 255.255.255.255 moxa(config-if)# no ip address 10.10.1.2</pre>	
<b>Error Messages</b>	<p>Invalid: Invalid IPv4 Address ipv4_config['ipAddress']/ ipv4_config['netmask']</p> <p>Invalid: This IPv4 address overlaps with other Interface IPv4 address.</p> <p>Invalid: [data.l3VlanIfTable] must contain less than or equal to 256 items.</p> <p>Invalid: Interface name is duplicated.</p> <p>Invalid: No such interface.</p>	
<b>Related Commands</b>	N/A	

## Show Interface Information

### Commands

**show ip interface** [ vlan <vlan-id> ]

<b>Syntax Description</b>	<b>show</b>	Display configuration/statistics/general information
	<b>ip</b>	IP-related information
	<b>interface</b>	Interface related information
	<b>vlan</b>	VLAN related information
	<vlan-id>	Specified vlan 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 ip interface  vlan1 is up, line protocol is up Internet Address is 192.168.127.250/24 Broadcast Address 192.168.127.255  vlan40 is up, line protocol is up Internet Address is 192.168.40.253/24 Broadcast Address 192.168.40.255  vlan30 is up, line protocol is down Internet Address is 30.100.1.253/24 Broadcast Address 30.100.1.2550</pre>	
<b>Error Messages</b>	% Invalid interface Index	
<b>Related Commands</b>	N/A	

## Configure Interface MTU

### Commands

**ip mtu** <mtu size>

<b>Syntax Description</b>	<b>ip</b>	Configure IP-related configuration
	<b>mtu</b>	Maximum transmission unit
	mtu size	The size of the allowable MTU in bytes; the legitimate range is 1400 to 3000.
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Interface VLAN Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# interface vlan 10 moxa(config-if)# ip mtu 2000	
<b>Error Messages</b>	Invalid input detected	
<b>Related Commands</b>	N/A	

## Show MTU Settings of the Existing Interfaces

### Commands

**show interfaces mtu** [vlan <vlan\_id>]

<b>Syntax Description</b>	<b>show</b>	Display configuration/statistics/general information
	<b>interfaces</b>	Display interface information
	<b>mtu</b>	Maximum transmission unit size
	vlan	VLAN related information
	<vlan id>	Specified VLAN ID
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC/ User EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	# show interfaces mtu  vlan1     MTU size is 1500  vlan40    MTU size is 1518	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Enable/Disable Proxy ARP

### Commands

**ip proxy-arp**

**no ip proxy-arp**

<b>Syntax Description</b>	<b>no</b>	Remove configuration/delete entry/reset to default value
	<b>ip</b>	Configure IP-related configuration
	<b>proxy-arp</b>	Proxy ARP related configuration
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Interface VLAN Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# interface vlan 10 moxa(config-if)# ip proxy-arp	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Show ARP Status for the Existing Interfaces

### Commands

**show ip proxy-arp**

<b>Syntax Description</b>	<b>show</b>	Display configuration/statistics/general information
	<b>ip</b>	IP-related configuration
	<b>proxy-arp</b>	Proxy-arp status
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC/ User EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# show ip proxy-arp PROXY ARP Status ----- vlan1 : Disabled vlan2 : Disabled vlan3 : Disabled	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Configure DNS 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	Index of DNS, range from 1 to 2
	server-address	IPv4 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)# ip management name-server 1 1.1.1.1 moxa(config)# no ip management name-server 1	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Debug

This section introduces the commands for displaying or saving detailed debugging information, such as system, protocol stacks, and switch status when troubleshooting is needed.

## Activate/Deactivate the Debug Function

### Commands

**debug** { start | stop }

<b>Syntax Description</b>	<b>debug</b>	Debugging information
	start	Start the run-time troubleshooting information
	stop	Stop the run-time troubleshooting information
<b>Defaults</b>	Disable	
<b>Command Modes</b>	Privileged EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# debug start	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	debug system startup	

## Activate/Deactivate the Debug Function After System Reboots

### Commands

**debug system startup**

**no debug system startup**

<b>Syntax Description</b>	<b>no</b>	Disable the configuration/delete the entry/reset to default value
	<b>debug</b>	Debugging information
	<b>system</b>	Switch system internal
	<b>startup</b>	System startup
<b>Defaults</b>	Disable	
<b>Command Modes</b>	Global Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# configure terminal moxa(config)# debug system startup moxa# copy running-config startup-config	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	debug { start   stop }	



### NOTE

When used, the debug function will be activated/deactivated after the system reboots. The command "debug start/stop" will immediately activate/deactivate the debug function.

## Configure the Module Debug Categories

### Commands

**debug module** [keyword1] [keyword2] [keyword3]

**no debug module** [keyword1] [keyword2] [keyword3]

<b>Syntax Description</b>	<b>no</b>	Disable the configuration/delete the entry/reset to default value
	<b>debug</b>	Debugging information
	<b>module</b>	Display the name of the module that can be debugged
	keyword1	The category of the module
	keyword2	The sub-category of the module
	keyword3	The option/feature of the sub-category
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# configure terminal moxa(config)# debug module ospf hello moxa#	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	debug { start   stop }	

## Configure the Debug Level Settings

### Commands

**debug level global** { level }

<b>Syntax Description</b>	<b>debug</b>	Debugging information
	<b>level</b>	The intended level for debug messages; level "debug" will display the most sophisticated information, while level "emergency" only prints out the most imminent urgent messages, which needs administrator's immediate involvement. The debug logs in level "debug" will comprise of those in level "info", and so on.
	<b>global</b>	Global configuration
	level options	Level options can be set as {emergency   alert   critical   error   warn   notice   info   debug}
<b>Defaults</b>	level notice	
<b>Command Modes</b>	Privileged EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# configure terminal moxa(config)# debug level global error moxa#	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	debug {start   stop}	

## Configure the Global Debug Level Settings for Modules

### Commands

**debug level** <module> { level } {reset}

<b>Syntax Description</b>	<b>debug</b>	Debugging information
	module	Module name
	level	The intended debugging level for the specific module; level "debug" will display the most sophisticated information, while level "emergency" only prints out the most imminent urgent messages, which needs administrator's immediate involvement. The debug logs in level "debug" will comprise of those in level "info", and so on.
	reset	Reset the level settings to the global settings or default value
<b>Defaults</b>	Same as the global debug level	
<b>Command Modes</b>	Privileged EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# configure terminal moxa(config)# debug level ospf error moxa#	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	debug level global { emergency   alert   critical   error   warn   notice   info   debug }	



### NOTE

Each module's debug level will directly inherit from the global level settings; users can configure different debug levels for different modules.

## Configure the Debug Burst Settings

### Commands

**debug burst**

**no debug burst**

<b>Syntax Description</b>	<b>no</b>	Unlimited number of debug messages
	<b>debug</b>	Debugging information
	<b>burst</b>	Burst limitation
<b>Defaults</b>	50 messages in 3 seconds	
<b>Command Modes</b>	Privileged EXEC	
<b>Usage Guidelines</b>	If the output debug messages exceed the burst limit, the run-time debug mechanism will immediately be stopped, and event log will have the message "Warning! Disabling the burst limitation could seriously impact system performance" Users have to manually activate the debug function by "debug start".	
<b>Examples</b>	moxa# configure terminal moxa(config)# debug burst moxa#	
<b>Error messages</b>	N/A	
<b>Warning messages</b>	Burst count threshold exceeded; turn off the debug log.	
<b>Related commands</b>	debug burst threshold <integer(1-100)> debug burst period <integer(1-10)>	

## Configure the Debug Burst Threshold Settings

### Commands

**debug burst threshold <integer(1-100)>**

<b>Syntax Description</b>	<b>debug</b>	Debugging information
	<b>burst</b>	Burst limitation
	<b>threshold</b>	Maximum number of debug messages
	<integer>	The allowable range is from 1 to 100
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# configure terminal moxa(config)# debug burst threshold 30 moxa#	
<b>Error Messages</b>	N/A	
<b>Warning Messages</b>	Burst count threshold exceeded; turn off the debug log.	
<b>Related Commands</b>	no debug burst debug burst period <integer(1-10)>	



### NOTE

To avoid potential performance deterioration, you can set the maximum allowable number of debug messages in a certain period. The system default is at most 50 messages in 3 seconds.



## Configure the Debug Burst Period Settings

### Commands

**debug burst period** <integer (1-10)>

<b>Syntax Description</b>	<b>debug</b>	Debugging information
	<b>burst</b>	The burst limitation
	<b>period</b>	The burst period
	<integer>	The allowable range is 1 to 10
<b>Defaults</b>	50 messages in 3 seconds	
<b>Command Modes</b>	Privileged EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# configure terminal moxa(config)# debug burst period 1 moxa#	
<b>Error Messages</b>	N/A	
<b>Warning Messages</b>	Burst count threshold exceeded; turn off the debug log.	
<b>Related Commands</b>	no debug burst debug burst threshold <integer(1-100)>	

## Configure the Debug Destination Settings

### Commands

**debug destination** { console | file | ram }

**no debug destination** { console | file | ram }

<b>Syntax Description</b>	<b>no</b>	Disable the configuration/delete the entry/reset to default value
	<b>debug</b>	Debugging information
	<b>destination</b>	The output media
	console	Console
	file	File in local non-volatile memory
	ram	RAM disk or volatile memory
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# configure terminal moxa(config)# debug destination file moxa#	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	debug destination { file   ram } size <integer 1-10>	



### NOTE

Debug messages can be redirected to either console, local file, or RAM disk.

## Configure the Debug Destination Size Settings

### Commands

**debug destination** { file | ram} **size** <integer 1-10>

<b>Syntax Description</b>	<b>debug</b>	Debugging information
	<b>destination</b>	Destination
	file	File in local non-volatile storage
	ram	RAM disk or volatile memory
	<b>size</b>	Maximum capacity of the reserved storage. Once the capacity is exceeded, the latest logs will overwrite the oldest 1Mb records.
	<integer 1-10>	Size (M)
<b>Defaults</b>	console	
<b>Command Modes</b>	Privileged EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# configure terminal moxa(config)# debug destination file size 6 moxa#	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	



### NOTE

You can change the size of file/RAM storage used for debug message output.

## Configure the Debug Terminal Settings

### Commands

**debug terminal**

<b>Syntax Description</b>	<b>debug</b>	Debugging information
	<b>terminal</b>	Current terminal
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# debug terminal moxa#	
<b>Error Messages</b>	N/A	
<b>Warning Messages</b>	Terminal output is transferred to console Terminal output is transferred to Telnet/SSH Terminal output is transferred to current terminal	
<b>Related Commands</b>	no debug burst debug burst threshold <integer(1-100)>	

## Display Global Settings for Debug Functions

### Commands

**show debug module global**

<b>Syntax Description</b>	<b>show</b>	Display configuration/statistics/general information
	<b>debug</b>	Display debugging information
	<b>module</b>	Module
	<b>global</b>	Global configuration
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<pre>moxa# show debug module global Status: Started Configure to Start Debug Log on System Startup: Yes Level: Notice Burst Limitation: Disabled Burst Threshold (count): 50 Burst Period (seconds): 3 Destination Console: Enabled Destination Ram: Disabled Destination File: Disabled Current Terminal: Console Minimum Reserved Destination Ram Size: 4 (M) Minimum Reserved Destination File Size: 4 (M) Current Destination Ram Size: 0 (0.00 M) Current Destination File Size: 2338389 (2.23 M)</pre>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	show debug module <module>	

## Display Global Settings for Debug Functions

### Commands

**show debug module <module>**

<b>Syntax Description</b>	<b>show</b>	Display configuration/statistics/general information
	<b>debug</b>	Display debugging information
	<b>module</b>	Module
	<b>&lt;module&gt;</b>	Module name
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<pre>moxa# show debug module secureSystemDiagnostics Module: secureSystemDiagnostics Level: Disable  Module List                               Status ----- user                                       Enabled user.enable                               Enabled user.disable                              Enabled account                                   Enabled ui   Enabled</pre>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	show debug global	

## Show Debug Destination File Information

### Commands

**show debug destination** {ram | file} {[filter] | [latest [<integer(1-10000)>]]}

<b>Syntax Description</b>	<b>show</b>	Display configuration/statistics/general information
	<b>debug</b>	Display debugging information
	<b>destination</b>	Destination
	ram	RAM disk or memory
	file	The local debug file
	filter	Grep the associated debug messages with the specified "string"
	latest	Display the latest instead of the complete messages.
	<integer(1-10000)>	Number of debug entries
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<pre> moxa# show debug destination file &lt;5&gt; 2020-09-29T22:43:49+00:00 moxa local6 ospf.general Rx Event 4096 &lt;5&gt; 2020-09-29T22:43:50+00:00 moxa local6 ospf.general Rx Event 4096 &lt;5&gt; 2020-09-29T22:43:51+00:00 moxa local6 ospf.general Rx Event 4096 &lt;5&gt; 2020-09-29T22:43:52+00:00 moxa local6 ospf.general Rx Event 4096 &lt;5&gt; 2020-09-29T22:43:53+00:00 moxa local6 ospf.general Rx Event 4096 &lt;5&gt; 2020-09-29T22:43:54+00:00 moxa local6 secureSystemDiagnostics.user.enable User enable &lt;5&gt; 2020-09-29T22:43:54+00:00 moxa local6 secureSystemDiagnostics.user User login &lt;5&gt; 2020-09-29T22:43:54+00:00 moxa local6 ospf.general Rx Event 4096 &lt;5&gt; 2020-09-29T22:43:55+00:00 moxa local6 ospf.general Rx Event 4096 ... moxa# show debug destination file filter Exceed &lt;3&gt; 2020-09-29T23:11:53+00:00 moxa local6 moxa_debug_log.events Exceed the burst count threshold, turn off the debug log &lt;3&gt; 2020-09-29T23:11:58+00:00 moxa local6 moxa_debug_log.events Exceed the burst count threshold, turn off the debug log &lt;3&gt; 2020-09-29T23:12:03+00:00 moxa local6 moxa_debug_log.events Exceed the burst count threshold, turn off the debug log &lt;3&gt; 2020-09-29T23:13:47+00:00 moxa local6 moxa_debug_log.events Exceed the burst count threshold, turn off the debug log &lt;3&gt; 2020-09-29T23:13:51+00:00 moxa local6 moxa_debug_log.events Exceed the burst count threshold, turn off the debug log &lt;3&gt; 2020-09-29T23:13:56+00:00 moxa local6 moxa_debug_log.events Exceed the burst count threshold, turn off the debug log ... </pre>	
<b>Error messages</b>	N/A	
<b>Related commands</b>	copy debug destination {ram file} {tftp://server/filename   sftp://<user-name>:<pass-word>@server/filename}	

## Copy Debug Destination Files

### Commands

**copy debug destination** {ram|file} {tftp://server/filename | sftp://<user-name>:<pass-word>@server/filename}

<b>Syntax Description</b>	<b>copy</b>	Perform copy operation
	<b>debug</b>	Debug log
	<b>destination</b>	Destination
	ram	RAM disk or volatile memory
	file	File in local non-volatile storage
	<tftp_url>	File in remote location to be copied via TFTP
	<sftp_url>	File in remote location to be copied via SFTP
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# copy debug destination ram tftp://192.168.127.168/debuglog.log Export success	
<b>Error Messages</b>	"Error! The permission is not allowed."	
<b>Related Commands</b>	show debug destination {ram   file} [filter <string(64)>]	

## Delete the Debug Destination Files

### Commands

**clear debug destination** {ram | file}

<b>Syntax Description</b>	<b>clear</b>	Clear the key pair
	<b>debug</b>	Debugging information
	<b>destination</b>	Destination
	ram	RAM disk or volatile memory
	file	File in local non-volatile storage
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# clear debug destination ram	
<b>Error Messages</b>	"Error! The permission is not allowed."	
<b>Related Commands</b>	show debug global	

# OSPF

## Show OSPF Interface Information

### Commands

**show ip ospf interface [vlan <vlan id>]**

<b>Syntax Description</b>	<b>ip</b>	IP-related information
	<b>ospf</b>	OSPF related information
	<b>interface</b>	Interface related information
	<b>vlan</b>	VLAN related information
	<vlan id>	Specified VLAN 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 ip ospf interface vlan 3 Interface name : vlan3 IP Address : 192.168.127.253 Mask : 255.255.255.0 Area : 0.0.0.0 Router ID : 10.5.5.4 Network Type : BROADCAST Cost : 1 Priority : 1  Timer intervals :   Hello : 10 secs            Hello due in 2 sec   Dead : 40 secs:   Retransmit : 5 secs   Transmit Delay : 1 sec  Authentication type : simple State : BDR   Designated Router   Id : 10.5.6.4   IP address : 10.4.0.4    Backup Designated Router   Id : 10.4.0.1   IP address : 10.4.0.1  Neighbor   Count : 1 Adjacent neighbor   count : 1   Adjacent with the neighbor :     10.5.6.4  Interface name : vlan1 IP Address : 192.168.127.253 is disable.</pre>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Show OSPF Neighbor Information

### Commands

**show ip ospf neighbor [vlan <vlan id>]**

<b>Syntax Description</b>	<b>ip</b>	IP-related information
	<b>ospf</b>	OSPF related information
	<b>neighbor</b>	Neighbor router
	<b>vlan</b>	VLAN related information
	<vlan id>	Specified VLAN 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 ip ospf neighbor vlan 3 Neighbor-ID   Pri  State      DeadTime  Address      Interface ----- 10.5.6.4      1    FULL/DR    34        10.4.0.4     vlan3 10.10.1.8     1    FULL/DR    35        10.10.2.8    vlan10</pre>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Show OSPF Request List

### Commands

**show ip ospf request-list**

<b>Syntax Description</b>	<b>ip</b>	IP-related information
	<b>ospf</b>	OSPF related information
	<b>request-list</b>	OSPF Link state request list information
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC/ User EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<pre>moxa# show ip ospf request-list OSPF Router with ID (10.5.6.6)  Neighbor 10.5.6.4, interface - address 10.5.6.4  Type LS-ID      ADV-RTR      SeqNo      Age      Checksum ----- 1 10.5.6.6      10.5.6.6    0x8000000c 149     0x7e5c 2 10.5.6.6      10.5.6.6    0x80000001 740     0x943a</pre>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Show OSPF Re-transmission List

### Commands

**show ip ospf retransmission-list**

<b>Syntax Description</b>	<b>ip</b>	IP-related information
	<b>ospf</b>	OSPF related information
	<b>retransmission-list</b>	OSPF Link state retransmission list information
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC/ User EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<pre>moxa# show ip ospf retransmission-list OSPF Router with ID (10.5.6.6)  Neighbor 10.5.6.4, interface - address 10.5.6.4 Queue length 1  Type LS-ID      ADV-RTR      SeqNo      Age      Checksum ----- 1  10.5.6.6     10.5.6.6     0x80000015  0        0xe6ca</pre>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Show OSPF Virtual Link Information

### Commands

**show ip ospf virtual-links**

<b>Syntax Description</b>	<b>ip</b>	IP-related information
	<b>ospf</b>	OSPF related information
	<b>virtual-links</b>	OSPF virtual link information
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC/ User EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<pre>moxa# show ip ospf virtual-links Virtual Link to router 10.7.0.6, Interface State is DOWN Transit Area 0.0.0.3 Transmit Delay is 1 sec, Neighbor State DOWN Authentication type : simple Timer intervals : Hello : 10 secs Dead : 40 secs: Retransmit : 5 secs</pre>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	



## Show OSPF Border Router Information

### Commands

show ip ospf border-routers

<b>Syntax Description</b>	<b>ip</b>	IP-related information
	<b>ospf</b>	OSPF related information
	<b>border-routers</b>	OSPF border and boundary router 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 ip ospf border-routers OSPF Process Border Router Information	
	Destination	TOS Type NextHop Cost Rt.Type Area
	-----	-----
	10.4.0.4	0 ASBR 10.10.2.1 2 interArea 0.0.0.6
	10.10.2.1	0 ABR 10.10.2.1 1 intraArea 0.0.0.6
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Show OSPF Area Range Information

### Commands

show ip ospf area-range

<b>Syntax Description</b>	<b>ip</b>	IP-related information
	<b>ospf</b>	OSPF related information
	<b>area-range</b>	Associated with the OSPF address 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 ip ospf area-range Display of Summary addresses for Type3 and Translated Type5	
	Vrf default ,Summary Address	
	-----	-----
	Network Mask LSAType Area Effect Tag	
	-----	-----
	10.10.0.0	255.255.0.0 Summary 0.0.0.6 Advertise 0
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Show OSPF Information

### Commands

show ip ospf

<b>Syntax Description</b>	<b>ip</b>	IP-related information
	<b>ospf</b>	OSPF related information
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC/ User EXEC	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	<pre>moxa# show ip ospf OSPF Router with ID (10.4.0.1)   It is an Area Border Router   Autonomous System Boundary Router : Disabled    Redistributing External Routes is disabled   Rfc1583 compatibility is enabled   Administrative Distance is 110    Area is 0.0.0.6   Number of interfaces in this area is 1   SPF algorithm executed 2 times    Area is 0.0.0.0   Number of interfaces in this area is 1   SPF algorithm executed 2 times    Number of Areas in this router is 2</pre>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Show OSPF Route Information

### Commands

show ip ospf route

<b>Syntax Description</b>	<b>ip</b>	IP-related information
	<b>ospf</b>	OSPF related information
	<b>route</b>	route Routes learnt by OSPF process
<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 ip ospf route OSPF Routing Table Dest/Mask                TOS NextHop/Interface      Cost Rt.Type  Area -----                - - - - - / - - - - -      - - - - -  - - - 10.4.0.0/255.255.0.0      0 0.0.0.0/vlan3           1  IntraArea 0.0.0.0 10.10.2.0/255.255.255.0  0 0.0.0.0/vlan10          1  IntraArea 0.0.0.6</pre>	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Show OSPF Database Information

### Commands

**show ip ospf database** [{database-summary | self-originate}]

<b>Syntax Description</b>	<b>ip</b>	IP-related information
	<b>ospf</b>	OSPF related information
	<b>database</b>	Displays how many of each type of LSA there are for each area in the database
	database-summary	Display how many of each type of LSA there are for each area in the database, and the total number of LSA types
	self-originate	Displays only self-originated LSAs (from the local router)
<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 ip ospf database database-summary Area 0.0.0.0 database summary ----- LSA Type          Count    Maxage ----- Router            2        0 Network           1        0 Summary Net       1        0 Summary ASBR      0        0 Type-7 Ext        0        0 Opaque Link       0        0 Opaque Area       0        0 Subtotal          4        0  Area 0.0.0.6 database summary ----- LSA Type          Count    Maxage ----- Router            2        0 Network           1        0 Summary Net       1        0 Summary ASBR      0        0 Type-7 Ext        0        0 Opaque Link       0        0 Opaque Area       0        0 Subtotal          4        0  OSPF Process database summary ----- LSA Type          Count    Maxage ----- Router            4        0 Network           2        0 Summary Net       2        0 Summary ASBR      0        0 Type-5 Ext        0        0 Type-7 Ext        0        0 Opaque Link       0        0 Opaque Area       0        0 Opaque AS         0        0 Total             8        0  MOXA# show ip ospf database self-originate OSPF Router with ID (10.4.0.1)       Router Link States (Area 0.0.0.0) ----- Link ID          ADV Router      Age      Seq#          Checksum Link count </pre>	

	----- 10.4.0.1      10.4.0.1      1002      0x8000007d      0xf382      1 ----- Summary Link States (Area 0.0.0.0) ----- Link ID      ADV Router      Age      Seq#      Checksum ----- 10.10.2.0      10.4.0.1      717      0x80000094      0xdaa8 ----- Router Link States (Area 0.0.0.6) ----- Link ID      ADV Router      Age      Seq#      Checksum      Link count ----- 10.4.0.1      10.4.0.1      1098      0x80000095      0x90b9      1 ----- Summary Link States (Area 0.0.0.6) ----- Link ID      ADV Router      Age      Seq#      Checksum ----- 10.4.0.0      10.4.0.1      717      0x80000093      0x3b51
<b>Error Messages</b>	N/A
<b>Related commands</b>	N/A

## Show OSPF Database by Specific LSA Type

### Commands

**show ip ospf database** { asbr-summary | external | network | nssa-external | router | summary }

<b>Syntax Description</b>	<b>ip</b>	IP-related information
	<b>ospf</b>	OSPF related information
	<b>database</b>	Display all of the LSA entries
	asbr-summary	Display information only about the Autonomous System Boundary Router (ASBR) summary LSAs
	external	Display information only about the external LSAs
	network	Display information only about the network LSAs
	nssa-external	Display information about the NSSA external LSAs
	router	Display information only about the router LSAs
summary	Display information only about the summary LSAs	
<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 ip ospf database  OSPF Router with ID (10.4.0.1)   Router Link States (Area 0.0.0.0)   -----   Link ID      ADV Router    Age      Seq#         Checksum    Link count   -----   10.4.0.1     10.4.0.1     1053    0x8000007d  0xf382     1   10.5.6.4     10.5.6.4     1056    0x80000124  0x1a9e     1    Network Link States (Area 0.0.0.0)   -----   Link ID      ADV Router    Age      Seq#         Checksum   -----   10.4.0.4     10.5.6.4     1056    0x80000092  0x470d    Summary Link States (Area 0.0.0.0)   -----   Link ID      ADV Router    Age      Seq#         Checksum</pre>	

	-----	-----	---	----	-----		
	10.10.2.0	10.4.0.1	768	0x80000094	0xdaa8		
		Router Link States (Area 0.0.0.6)					
	-----	-----	---	----	-----		
	Link ID	ADV Router	Age	Seq#	Checksum	Link count	
	-----	-----	---	----	-----		
	10.4.0.1	10.4.0.1	1150	0x80000095	0x90b9	1	
	10.10.1.8	10.10.1.8	1094	0x80000093	0xf831	1	
		Network Link States (Area 0.0.0.6)					
	-----	-----	---	----	-----		
	Link ID	ADV Router	Age	Seq#	Checksum		
	-----	-----	---	----	-----		
	10.10.2.8	10.10.1.8	1094	0x80000092	0xc679		
		Summary Link States (Area 0.0.0.6)					
	-----	-----	---	----	-----		
	Link ID	ADV Router	Age	Seq#	Checksum		
	-----	-----	---	----	-----		
	10.4.0.0	10.4.0.1	768	0x80000093	0x3b51		
<b>Error Messages</b>	N/A						
<b>Related Commands</b>	N/A						

## Enable/Disable OSPF Settings

### Commands

**router ospf** {enable | disable}

<b>Syntax Description</b>	<b>router</b>	Configures router related information
	<b>ospf</b>	OSPF related configuration
	enable/disable	Enable/disable OSPF routing process
<b>Defaults</b>	disable	
<b>Command Modes</b>	Global Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# router ospf enable	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Configure Router OSPF Settings

### Commands

**router ospf**

<b>Syntax Description</b>	<b>router</b>	Configure router related information
	<b>ospf</b>	OSPF related configuration
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Global Configuration Mode	
<b>Usage Guidelines</b>	Enter OSPF router configuration mode	
<b>Examples</b>	moxa(config)# router ospf	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Configure Route ID

### Commands

**router-id** <ip\_addr>

**no router-id**

<b>Syntax Description</b>	<b>no</b>	Disable the configuration/delete the entry/reset to default value
	<b>router-id</b>	Set OSPF router ID
	ip_addr	IP address for the router
<b>Defaults</b>	N/A	
<b>Command Modes</b>	OSPF Router Configuration Mode	
<b>Usage Guidelines</b>	Set the router-id as 0.0.0.0 or use no router-id command, it will dynamically select the lowest IP address as router ID	
<b>Examples</b>	moxa(config-router)# router-id 10.4.0.1	
<b>Error messages</b>	N/A	
<b>Related commands</b>	N/A	

## Configure Network Area Settings

### Commands

**network** <ip\_addr> **area** <area-id>

**no network** <ip\_addr> **area** <area-id>

<b>Syntax Description</b>	<b>no</b>	Disable the configuration/delete the entry/reset to default value
	<b>network</b>	Configures network related information
	<ip_addr>	IPv4 address of the network
	<b>area</b>	Area related configuration
	<area-id>	Area associated with the OSPF address range
<b>Defaults</b>	N/A	
<b>Command Modes</b>	OSPF Router Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config-router)# network 10.4.0.1 area 0.0.0.0	
<b>Error Messages</b>	% OSPF: Invalid: The IP address has not been configured. % OSPF: Invalid: Mismatched Area ID. % OSPF: Invalid: The area has not been configured. % OSPF: Invalid: The area has not been created. % OSPF: Invalid: There are configured neighbors on this interface so the network type cannot be changed. % OSPF: Invalid: Demand Circuit is not supported. % OSPF: Invalid: The advertisement of the indicated aggregate can not be disabled. OSPF: Invalid: The maximum number (75) of active OSPF interfaces has been exceeded. % OSPF: Invalid: The interface does not support this feature.	
<b>Related Commands</b>	N/A	

## Configure Redistribute Settings

### Commands

**redistribute** {static | connected | all} [**metric** <integer(1-16777214)>] [**metric-type** <integer(1-2)>]

**no redistribute** {static | connected | all}

<b>Syntax Description</b>	<b>no</b>	Disable the configuration/delete the entry/reset to default value
	<b>redistribute</b>	Configures route redistribution related parameters
	static/connected/ rip/all	Redistribute protocol
	<b>metric</b>	Metric related configuration
	<b>metric-type</b>	OSPF exterior metric type for redistributed routes
<b>Defaults</b>	N/A	
<b>Command Modes</b>	OSPF Router Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config-router)# redistribute static	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Configure Area Settings

### Commands

**area** <area-id> [{ nssa | stub }] [ no-summary]

**no area** <ip\_addr> [{ stub [no-summary] | nssa[no-summary]]}

<b>Syntax Description</b>	<b>no</b>	Disable the configuration/delete the entry/reset to default value
	<b>area</b>	Configures area related information
	<area-id>	Area associated with the OSPF address range
	nssa/ stub	NSSA/Stub area related configuration
	no-summary	The router will neither originate nor propagate summary LSAs into the area
<b>Defaults</b>	N/A	
<b>Command Modes</b>	OSPF Router Configuration Mode	
<b>Usage Guidelines</b>	Create normal area : area <area-id> Create nssa area : area <area-id> nssa Create stub area : area <area-id> stub Reset to standard area : no area <area-id> nssa	
<b>Examples</b>	moxa(config-router)#area 0.0.0.6 nssa	
<b>Error Messages</b>	% OSPF: Invalid: The Area Type has not been configured. % OSPF: Invalid: The Backbone area cannot be set as a stub area or NSSA. % OSPF: Invalid: The area for which a virtual link has been configured cannot serve as stub or NSSA area. % OSPF: Invalid: The area has not been configured. % OSPF: Invalid: The area has not been created. % OSPF: Invalid: There are configured neighbors on this interface so the network type cannot be changed. % OSPF: Invalid: The Area ID is already associated with the aggregate area. (The existing function can still be used.) % OSPF: Invalid: The Area ID is already associated with the interface table. (The existing function can still be used.) % OSPF: Invalid: The Area ID is already associated with the virtual interface. (The existing function can still be used.) % OSPF: Invalid: This Area ID already exists. % OSPF: Invalid: The Backbone area can not be deleted.	
<b>Related Commands</b>	N/A	

## Configure Area Virtual Link Settings

### Commands

**area** < area-id > **virtual-link** < router-id > [**auth** { **simple** | **md5** | **sha-1** | **sha-224** | **sha-256** | **sha384** | **sha-512**}] [**hello-interval** <short (1-65535)>][**dead-interval** <integer (1-65535)>] [{**auth-key** <string(8)> | **key-id** <integer (0-255)> **auth-key** <string(16)>}]

**no area** <ip\_addr> **virtual-link** <ip\_addr> [**auth**] [**hello-interval**] [**dead-interval**]

<b>Syntax Description</b>	<b>area</b>	Configures area related information
	<area-id>	Area associated with the OSPF address rang
	<b>virtual-link</b>	Virtual link related configuration
	<router-id>	Router ID of the virtual neighbor
	<b>auth</b>	Authentication related configuration
	<b>hello-interval</b>	Interval between hello packets that the software sends on the OSPF virtual link interface
	<b>dead-interval</b>	Interval at which hello packets must not be seen before its neighbors declare the router down
	<b>auth-key</b> <b>key-id</b>	Authentication key value Cryptographic authentication key ID
<b>Defaults</b>	N/A	
<b>Command Modes</b>	OSPF Router Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config-router)# area 0.0.0.3 virtual-link 10.7.0.6 auth sha-1 hello-interval 10 dead-interval 40 key-id 12 auth-key 456	
<b>Error Messages</b>	% OSPF: Invalid: The area has not been created. % OSPF: Invalid: The crypt authentication key has not been set yet. % OSPF: Invalid: The maximum length of the crypt authentication key is 16. % OSPF: Invalid: The simple authentication key has not been set yet. % OSPF: Invalid: The maximum length of the simple authentication key is 8. % OSPF: Invalid: The Virtual Interface already exists. % OSPF: Invalid: The virtual link cannot be configured on stub, NSSA, or the backbone area. % OSPF: Invalid: The virtual link cannot be configured since the area does not exist on any of the OSPF interfaces that are running. % OSPF: Invalid: The Dead Interval should be bigger than the Hello Interval. % OSPF: Invalid: The neighbor of another area of the virtual link's endpoint already exists.	
<b>Related Commands</b>	N/A	



## Configure Area Range Settings

### Commands

**area** <area-id> **range** <ip\_addr> <ip\_mask> {**summary** | **Type7**}

**no area** <area-id> **range** <ip\_addr> [**Type7**]

<b>Syntax Description</b>	<b>no</b>	Disable the configuration/delete the entry/reset to default value
	<b>area</b>	Configures area related information
	<b>range</b>	Address range configuration
	<b>Summary/Type7</b>	LSA type is set as summary LSA or Type-7 LSA
<b>Defaults</b>	N/A	
<b>Command Modes</b>	OSPF Router Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config-router)# area 0.0.0.6 range 10.10.2.0 255.255.255.0 summary	
<b>Error Messages</b>	% OSPF: Invalid: The area has not been created. % OSPF: Invalid: The advertisement of the indicated aggregate can not be disabled. % OSPF: Invalid: The number of addresses for this area has been exceeded. (The maximum is three.) % OSPF: Invalid: The address/mask combination is inconsistent. % OSPF: Invalid: The same Address Range has already been configured in this area and cannot be used. % OSPF: Invalid: The Aggregate area already exists. (The existing function can still be used.) % OSPF: Invalid: The Area ID is already associated with the aggregate area. (The existing function can still be used.)	
<b>Related Commands</b>	N/A	

## Configure the Neighbor Router Priority Settings

### Commands

**neighbor** <neighbor-ip-address> [**priority** <integer (0-255)>]

**no neighbor** <ip\_addr> [**priority**]

<b>Syntax Description</b>	<b>no</b>	Disable the configuration/delete the entry/reset to default value
	<b>neighbor</b>	Specify a neighbor router
	<b>priority</b>	0 means no election; larger number means higher priority
<b>Defaults</b>	N/A	
<b>Command Modes</b>	OSPF Router Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config-router)# neighbor 10.10.2.8 priority 1	
<b>Error messages</b>	% OSPF: Invalid: There are configured neighbors on this interface so the network type cannot be changed. % OSPF: Invalid: The address/mask combination is inconsistent. % OSPF: Invalid: The IP address of a local interface cannot be configured as a neighbor IP address. % OSPF: Invalid: The Neighbor IP address does not fall into any of the interface networks. % OSPF: Invalid: The Neighbor IP address can only be configured on NBMA or point-to-multipoint networks. % OSPF: Invalid: The Neighbor IP address already exists.	
<b>Related commands</b>	N/A	

## Configure OSPF with Legacy OSPFv2 (RFC1583) Compatibility

### Commands

**compatible rfc1583**

**no compatible rfc1583**

<b>Syntax Description</b>	<b>no</b>	Disable the configuration/delete the entry/reset to default value
	<b>Compatible rfc1583</b>	Set OSPF compatibility list compatible with RFC 1583
<b>Defaults</b>	N/A	
<b>Command Modes</b>	OSPF Router Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config-router)# compatible rfc1583	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Configure SPF (Shortest Path First) Holdtime Settings

### Commands

**spf holdtime < integer(0-65535)>**

<b>Syntax Description</b>	<b>spf holdtime</b>	Minimum time (in milliseconds) between two consecutive SPF calculations
	Integer(0-65535)	Set the spf holdtime in milliseconds
<b>Defaults</b>	5000	
<b>Command Modes</b>	OSPF Router Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config-router)# spf holdtime 7000	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Configure OSPF Passive Interface Settings

### Commands

**ip ospf passive-interface**

**no ip ospf passive-interface**

<b>Syntax Description</b>	<b>no</b>	Disable the configuration/delete the entry/reset to default value
	<b>ip</b>	Configure IP-related information
	<b>ospf</b>	OSPF related configuration
	<b>passive-interface</b>	Configure routing update details
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Interface Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config-if)# ip ospf passive-interface	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Configure OSPF Priority Settings

### Commands

**ip ospf priority** <integer(0 - 255)>

**no ip ospf priority**

<b>Syntax Description</b>	<b>no</b>	Disable the configuration/delete the entry/reset to default value
	<b>ip</b>	Configures IP-related information
	<b>ospf</b>	OSPF related configuration
	<b>priority</b>	Router priority configuration
	integer(0-255)	Set the priority parameter
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Interface Configuration Mode	
<b>Usage Guidelines</b>	1	
<b>Examples</b>	moxa(config-if)# ip ospf priority 10	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Configure OSPF Hello Interval Settings

### Commands

**ip ospf hello-interval** <integer(1 - 65535)>

**no ip ospf hello-interval**

<b>Syntax Description</b>	<b>no</b>	Disable the configuration/delete the entry/reset to default value
	<b>ip</b>	Configure IP-related information
	<b>ospf</b>	OSPF related configuration
	<b>hello-interval</b>	Interval (in seconds) between hello packets sent on the interface
	integer(1 - 65535)>	Interval parameter
<b>Defaults</b>	10	
<b>Command Modes</b>	Interface Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config-if)# ip ospf hello-interval 15	
<b>Error Messages</b>	% OSPF: Invalid: The Dead Interval should be bigger than the Hello Interval.	
<b>Related Commands</b>	N/A	

## Configure OSPF Dead Interval Settings

### Commands

**ip ospf dead-interval** <integer(1-65535)>

**no ip ospf dead-interval**

<b>Syntax Description</b>	<b>no</b>	Disable the configuration/delete the entry/reset to default value
	<b>ip</b>	Configures IP-related information
	<b>ospf</b>	OSPF related configuration
	<b>dead-interval</b>	Interval (in seconds) at which hello packets must not be seen before neighbors declare the router down
	integer(1-65535)	Set the interval parameter
<b>Defaults</b>	40	
<b>Command Modes</b>	Interface Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config-if)# ip ospf dead-interval 20	
<b>Error Messages</b>	% OSPF: Invalid: The Dead Interval should be bigger than the Hello Interval.	
<b>Related Commands</b>	N/A	

## Configure the OSPF Cost Settings

### Commands

**ip ospf cost** <integer (1-65535)>

**no ip ospf cost**

<b>Syntax Description</b>	<b>no</b>	Disable the configuration/delete the entry/reset to default value
	<b>ip</b>	Configures IP-related information
	<b>ospf</b>	OSPF related configuration
	<b>cost</b>	Path cost configuration
	integer(10-65535)	Set the cost parameter
<b>Defaults</b>	1	
<b>Command Modes</b>	Interface Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config-if)# ip ospf cost 30	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Configure OSPF Authentication Settings

### Commands

**ip ospf auth simple auth-key** <string (8)>

**ip ospf auth {md5 | sha-1 | sha-224 | sha-256 | sha-384 | sha-512} key-id** <integer (0-255)>  
**auth-key** <string (16)>

**no ip ospf auth**

<b>Syntax Description</b>	<b>no</b>	Disable the configuration/delete the entry/reset to default value
	<b>ip</b>	Configures IP-related information
	<b>ospf</b>	OSPF related configuration
	<b>auth</b>	Authentication related configuration
	md5, sha-1, sha-224, sha-256, sha-384, sha-512	Set the authentication methods
	<b>key-id</b>	Cryptographic authentication key ID
	<b>auth-key</b>	Authentication key 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)# ip ospf auth simple auth-key 123456	
<b>Error Messages</b>	% OSPF: Invalid: The crypt authentication key has not been set yet. % OSPF: Invalid: The maximum length of the crypt authentication key is 16. % OSPF: Invalid: The simple authentication key has not been set yet. % OSPF: Invalid: The maximum length of the simple authentication key is 8.	
<b>Related Commands</b>	N/A	

## Configure OSPF Network Settings

### Commands

**ip ospf network** {broadcast | non-broadcast | point-to-multipoint | point-to-point}

**no ip ospf network**

<b>Syntax Description</b>	<b>no</b>	Disable the configuration/delete the entry/reset to default value
	<b>ip</b>	Configures IP-related information
	<b>ospf</b>	OSPF related configuration
	<b>network</b>	Network related configuration
<b>Defaults</b>	broadcast	
<b>Command Modes</b>	Interface Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config-if)# ip ospf network point-to-multipoint	
<b>Error Messages</b>	% OSPF: Invalid: There are configured neighbors on this interface so the network type cannot be changed. % OSPF: Invalid: The Neighbor IP address only can be configured on NBMA or point-to-multipoint networks.	
<b>Related Commands</b>	N/A	

## VRRP

### Enable/Disable VRRP Functions

#### Commands

**router vrrp** { enable | disable }

<b>Syntax Description</b>	<b>router</b>	Configures router related information
	<b>vrrp</b>	VRRP related configuration
	enable	Enables VRRP
	disable	Disables VRRP
<b>Defaults</b>	disable	
<b>Command Modes</b>	Global Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# router vrrp enable  moxa# configure moxa(config)# router vrrp disable	
<b>Error messages</b>	N/A	
<b>Related Commands</b>	N/A	

### Enter the VRRP Configuration Mode

#### Commands

**router vrrp**

<b>Syntax Description</b>	<b>router</b>	Configure router related information
	<b>vrrp</b>	VRRP related configuration
<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)# router vrrp moxa(config-vrrp)#	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Configure the VRRP Version Settings

### Commands

**vrrp version** { v2 | v3 }

<b>Syntax Description</b>	<b>vrrp</b>	Configure the VRRP related parameters
	<b>version</b>	Version related configuration
	v2	Enable VRRP Version 2
	v3	Enable VRRP Version 3
<b>Defaults</b>	v2	
<b>Command Modes</b>	VRRP Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# router vrrp moxa(config-vrrp)# vrrp version v2	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Configure the Virtual Router IP Address

### Commands

**vrrp** <vrid(1-255)> **ip** <ip-addr>

<b>Syntax Description</b>	<b>vrrp</b>	Configures the VRRP related parameters
	vrid	virtual router ID
	<b>ip</b>	IP-related configuration
	ip-addr	IP address
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Interface Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# interface vlan 2 moxa(config-if)# vrrp 2 ip 192.168.2.1	
<b>Error Messages</b>	<p>% VRRP: Invalid: If any of the existing virtual routers have advertisement intervals less than 1 second, then the maximum number of virtual routers is 16.</p> <p>% VRRP: Invalid: The associated IP conflicts with another associated IP.</p> <p>% VRRP: Invalid: The associated IP cannot be 0.0.0.0 or Class D, Class E, or vlan address.</p> <p>% VRRP: Invalid: The interface name is not an existing L3 VLAN interface or the L3 VLAN interface cannot be removed when VRRP is being used.</p> <p>% VRRP: Invalid: The associated IP and L3 VLAN interface IP must be in the same subnet.</p> <p>% VRRP: Invalid: The associated IP cannot be an L3 VLAN interface network address.</p> <p>% VRRP: Invalid: The associated IP cannot be an L3 VLAN interface broadcast address.</p> <p>% VRRP: Invalid: The associated IP cannot be active when the L3 VLAN interface IP or subnet mask is not set.</p>	
<b>Related Commands</b>	N/A	

## Delete the Virtual Router in the Interface

### Commands

**no vrrp** <vrid(1-255)>

<b>Syntax Description</b>	<b>no</b>	Disables configuration/delete entry/reset to default value
	<b>vrrp</b>	VRRP related configuration
	vrid	virtual router ID
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Interface Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# interface vlan 2 moxa(config-if)# no vrrp 2	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Enable the Virtual Router in the Interface

### Commands

**vrrp** <vrid(1-255)> **active**

<b>Syntax Description</b>	<b>vrrp</b>	Configures the VRRP related parameters
	vrid	virtual router ID
	<b>active</b>	Make the virtual router active
<b>Defaults</b>	Enabled	
<b>Command Modes</b>	Interface Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# interface vlan 2 moxa(config-if)# vrrp 2 active	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Disable the Virtual Router in the Interface

### Commands

**no vrrp** <vrid(1-255)> **active**

<b>Syntax Description</b>	<b>no</b>	Disable configuration/delete entry/reset to default value
	<b>vrrp</b>	VRRP related configuration
	vrid	virtual router ID
	<b>active</b>	Make the virtual router active
<b>Defaults</b>	Enabled	
<b>Command Modes</b>	Interface Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# interface vlan 2 moxa(config-if)# no vrrp 2 active	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Set the Virtual Router Priority

### Commands

**vrpp** <vrid(1-255)> **priority** <priority(1-254)>

<b>Syntax Description</b>	<b>vrpp</b>	Configures the VRRP related parameters
	vrid	virtual router ID
	<b>priority</b>	priority related configuration
	prio-value	priority used for the virtual router master election process; larger number means higher priority
<b>Defaults</b>	100	
<b>Command Modes</b>	Interface Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa-product# configure moxa-product(config)# interface vlan 2 moxa-product(config-if)# vrrp 2 priority 150	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Set the Virtual Router Priority to the Default Value

### Commands

**no vrrp** <vrid(1-255)> **priority**

<b>Syntax Description</b>	<b>no</b>	Disables configuration/delete entry/reset to default value
	<b>vrpp</b>	VRRP related configuration
	vrid	virtual router ID
	<b>priority</b>	priority related configuration
<b>Defaults</b>	100	
<b>Command Modes</b>	Interface Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# interface vlan 2 moxa(config-if)# no vrrp 2 priority	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Enable the Preempt Mode

### Commands

**vrpp** <vrid(1-255)> **preempt** [**Delay** <Seconds (0-3600)>]

<b>Syntax Description</b>	<b>vrpp</b>	Configure the VRRP related parameters
	vrid	virtual router ID
	<b>preempt</b>	Preempt mode related configuration
	<b>delay</b>	Preempt delay related configuration
	seconds	Delay time
<b>Defaults</b>	Preempt mode: Enable/Preempt delay time: 0	
<b>Command Modes</b>	Interface Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa-product# configure moxa-product(config)# interface vlan 2 moxa-product(config-if)# vrrp 2 preempt moxa-product(config-if)# vrrp 2 preempt delay 15	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	



## Disable the Preempt Mode

### Commands

**no vrrp** <vrid(1-255)> **preempt** [**delay**]

<b>Syntax Description</b>	<b>no</b>	Disables configuration/delete entry/reset to default value
	<b>vrrp</b>	VRRP related configuration
	vrid	virtual router ID
	<b>preempt</b>	preempt mode related configuration
	<b>delay</b>	Preempt delay related configuration
<b>Defaults</b>	Preempt mode: Enable Preempt delay time: 0	
<b>Command Modes</b>	Interface Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa-product# configure moxa-product(config)# interface vlan 2 moxa-product(config-if)# no vrrp 2 preempt moxa-product(config-if)# no vrrp 2 preempt delay	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Set the Authentication Type for the Virtual Router to Simple Password

### Commands

**vrrp** <vrid(1-255)> **text-authentication** <password>

<b>Syntax Description</b>	<b>vrrp</b>	Configures the VRRP related parameters
	vrid	virtual router ID
	<b>text-authentication</b>	simple password authentication related configuration
	password	authentication password used to validate the incoming VRRP packets
<b>Defaults</b>	no authentication	
<b>Command Modes</b>	Interface Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# interface vlan 2 moxa(config-if)# vrrp 2 text-authentication aaaaaaa	
<b>Error Messages</b>	% VRRP: Invalid: The VRRP version must be V2 when configuring auth type or auth key. % VRRP: Invalid: The maximum length of VRRP authentication key is 8 characters.	
<b>Related Commands</b>	N/A	

## Set the Authentication Type for the Virtual Router to None

### Commands

**no vrrp** <vrid(1-255)> **text-authentication**

<b>Syntax Description</b>	<b>no</b>	Disables configuration/delete entry/reset to default value
	<b>vrrp</b>	VRRP related configuration
	vrid	virtual router ID
	<b>text-authentication</b>	simple password authentication related configuration
<b>Defaults</b>	no authentication	
<b>Command Modes</b>	Interface Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# interface vlan 2 moxa(config-if)# no vrrp 2 text-authentication	
<b>Error Messages</b>	% VRRP: Invalid: The VRRP version must be V2 when configuring auth type or auth key.	
<b>Related Commands</b>	N/A	

## Set the Advertisement Timer for the Virtual Router

### Commands

**vrrp** <vrid(1-255)> **timer** [**msec**] <interval(1-255)secs>

<b>Syntax Description</b>	<b>vrrp</b>	Configures the VRRP related parameters
	vrid	virtual router ID
	<b>timer</b>	timer related configuration
	<b>msec</b>	Unit is changed to milli-seconds
	interval	Acceptable range for version 2 and version 3 are (1-40secs)/(30-40000msecs)
<b>Defaults</b>	1sec/1000msecs	
<b>Command Modes</b>	Interface Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# interface vlan 2 moxa(config-if)# vrrp 2 timer 2  moxa(config)# interface vlan 2 moxa-(config-if)# vrrp 2 timer msec 100	
<b>Error Messages</b>	% VRRP: Invalid: If any of the existing virtual routers have advertisement intervals less than 1 second, then the maximum number of virtual routers is 16. % VRRP: Invalid: The advertisement interval must be set as a multiple of 10, e.g. 30 ms, 40 ms, 50 ms etc.	
<b>Related Commands</b>	N/A	

## Set the Advertisement Timer for the Virtual Router to the Default Value

### Commands

**no vrrp** <vrid(1-255)> **timer**

<b>Syntax Description</b>	<b>no</b>	Disables configuration/delete entry/reset to default value
	<b>vrrp</b>	VRRP related configuration
	vrid	virtual router ID
	<b>timer</b>	timer related configuration
<b>Defaults</b>	1sec (or 1000msecs)	
<b>Command Modes</b>	Interface Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# interface vlan 2 moxa(config-if)# no vrrp 2 timer	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Enable the Accept Mode

### Commands

**vrrp** <vrid(1-255)> **accept-mode**

<b>Syntax Description</b>	<b>vrrp</b>	Configures the VRRP related parameters
	vrid	virtual router ID
	<b>accept-mode</b>	accept mode related configuration
<b>Defaults</b>	enable	
<b>Command Modes</b>	Interface Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# interface vlan 2 moxa(config-if)# vrrp 2 accept-mode	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Disable the Accept Mode

### Commands

**no vrrp <vrid(1-255)> accept-mode**

<b>Syntax Description</b>	<b>no</b>	Disables configuration/delete entry/reset to default value
	<b>vrrp</b>	VRRP related configuration
	<b>vrid</b>	virtual router ID
	<b>accept-mode</b>	accept mode related configuration
<b>Defaults</b>	enable	
<b>Command Modes</b>	Interface Configuration Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa(config)# interface vlan 2 moxa(config-if)# no vrrp 2 accept-mode	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Show the VRRP Information

### Commands

**show vrrp [ interface { vlan <vlan-id> } <vrId(1-255)> ] [ { brief | detail | statistics } ]**

<b>Syntax Description</b>	<b>show</b>	Display configuration / statistics / general information
	<b>vrrp</b>	Displays VRRP information
	<b>interface</b>	VRRP status for the interface
	<b>vlan</b>	VLAN interface
	<b>vlan-id</b>	The range (1-4094) is for VLAN ID
	<b>vrId</b>	Virtual router ID
	<b>brief</b>	Brief information
	<b>detail</b>	Detailed information
	<b>statistics</b>	Statistics related information
<b>Defaults</b>	brief	
<b>Command Modes</b>	Privileged EXEC Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# show vrrp  moxa# show vrrp detail  moxa# show vrrp statistics  moxa# show vrrp interface vlan 2  moxa# show vrrp interface vlan 2 2	
<b>Error Messages</b>	N/A	
<b>Related Commands</b>	N/A	

## Show the VRRP Information for the Interface

### Commands

**show vrrp interface** [ { **vlan** <vlan-id> } ] [ { **brief** | **detail** | **statistics** } ]

<b>Syntax Description</b>	<b>show</b>	Display configuration / statistics / general information
	<b>vrrp</b>	Displays VRRP information
	<b>interface</b>	VRRP status for the interface
	<b>vlan</b>	VLAN interface
	vlan-id	The range (1-4094) is for VLAN ID
	<b>brief</b>	Brief information
	<b>detail</b>	Detailed information
	<b>statistics</b>	Statistics-related information
<b>Defaults</b>	brief	
<b>Command Modes</b>	Privileged EXEC Mode	
<b>Usage Guidelines</b>	N/A	
<b>Examples</b>	moxa# show vrrp interface	
	moxa# show vrrp interface detail	
	moxa# show vrrp interface statistics	
	moxa# show vrrp interface vlan 2	
<b>Error Messages</b>	N/A	
<b>Related commands</b>	N/A	

## DHCP Relay Agent

### Show the DHCP Relay Configuration

#### Commands

**show ip dhcp relay**

<b>Syntax Description</b>	<b>show</b>	Display configuration/statistics information
	<b>ip</b>	Display IP-related configuration
	<b>dhcp</b>	Display DHCP-related configuration
	<b>relay</b>	Display DHCP Relay configurations
<b>Defaults</b>	N/A	
<b>Command Modes</b>	Privileged EXEC/ User EXEC	
<b>Usage Guidelines</b>	Use this command to show the details of the current DHCP relay configuration.	
<b>Examples</b>	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	
Number of Packets inserted option 82 : 0		
Number of Packets dropped : 0		
Number of Packets which did not inserted option 82 : 0		
Interface Relay Option 82 Trusted		
-----		

	Eth1/1	Disabled	Disabled	Untrusted
	Eth1/2	Disabled	Disabled	Untrusted
	Eth1/3	Disabled	Disabled	Untrusted
	Eth1/4	Enabled	Enabled	Trusted
	Eth1/5	Disabled	Disabled	Untrusted
<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 configuration
	<b>dhcp</b>	Clear DHCP-related configuration
	<b>relay</b>	Clear DHCP relay-related configuration
	<b>statistic</b>	Clear DHCP relay statistics information
	<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 or Disable the DHCP Relay Agent

### Commands

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

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

## Configure the DHCP Relay Server

### Commands

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

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

<b>Syntax Description</b>	<b>ip</b>	Configure IP-related configuration
	<b>dhcp</b>	Configure DHCP-related configuration
	<b>relay</b>	Configure DHCP relay configuration
	<b>server</b>	Configure DHCP relay server configuration
	<server-index>	Specify the DHCP server address index (1 to 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 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

### Commands

**ip dhcp relay**

**no ip dhcp relay**

<b>Syntax Description</b>	<b>ip</b>	Configure IP-related configuration
	<b>dhcp</b>	Configure DHCP-related configuration
	<b>relay</b>	Configure the DHCP relay interface status
<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 configuration
	<b>dhcp</b>	Configure DHCP-related configuration
	<b>relay</b>	Configure DHCP relay configuration
	<b>trust</b>	Configure 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 DHCP packets with Option 82 information or DHCP packets with a non-zero GIAddr received from untrusted 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	