



**RG-S5760**

**RGOS 10.4(2)**

©2010



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# RGOS® 10.4(2)

,  
,  
,

**1.**

Courier New

5

**2.**

Arial

```
[]      []  
{x|y|...}  
[x|y|...]  
//
```

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1.

2.

3.

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# 1 CLI

## 1.1

### 1.1.1 alias

alias

no

**alias** *mode command-alias original-command*

**no alias** *mode [original-command]*

<i>mode</i>	
<i>command-alias</i>	
<i>original-command</i>	

EXEC

EXEC

h p s u un

help ping show

undebug undebug

no alias exec

```

Ruijie# s?
*s=show show start-chat start-terminal-service
EXEC
"sv" "show version"
Ruijie# s?
*s=show *sv="show version" show start-chat
start-terminal-service

Ruijie# s?
show start-chat start-terminal-service
"ia"
"ip address"
Ruijie(config-if)# ia ?
A.B.C.D IP address
dhcp IP Address via DHCP
Ruijie(config-if)# ip address
"ip address"

show aliases

```

```

"def-route" "ip route"
0.0.0.0 0.0.0.0 192.168.1.1"
Ruijie# configure terminal
Ruijie(config)# alias config def-route ip route 0.0.0.0 0.0.0.0
192.168.1.1
Ruijie(config)# def-route?
*def-route="ip route 0.0.0.0 0.0.0.0 192.168.1.1"
Ruijie(config)# def-route?
% Unrecognized command.
Ruijie(config)# end
Ruijie# show aliases config
globe configure mode alias:
def-route ip route 0.0.0.0 0.0.0.0 192.168.1.1

```

<b>show aliases</b>	

---

---

---

---

**privilege**

*ommand-string*

*mand-string*

---

---

CLI

0-15

---

---

---

---

CLI

**privilege ?**

---

---

0.0.2 294.68 -139.2 -19.1Hp

```

Ruijie(config)# enable secret level 1 0 test
Ruijie(config)# privilege exec level 1 reload
                1    CLI                reload
Ruijie> reload ?
<cr>
                reload                1                all
Ruijie(config)# privilege exec all level 1 reload
                1    CLI                reload
Ruijie> reload ?
at                reload at a specific time/date
cancel            cancel pending reload scheme
in                reload after a time interval
<cr>

```

<b>enable secret</b>	CLI

## EXEC

```
Ruijie# show aliases exec
```

```
exec mode alias:
```

```
h             help  
p             ping  
s             show  
u             undebug  
un            undebug
```



---

# 2

## 2.1

### 2.1.1 disable

disable

**disable** [*privilege-level*]

	<i>privilege-level</i>	

|

|

|

/ **disable**

|

Ruijie# **disable 10**

	enable	

|

	-	-

## 2.1.2 enable

enable

	-	-

--	--

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	-	-

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	-	-

## 2.1.3 enable password

enable password

no

**enable password** [*level level*] {*password* | [0 | 7] *encrypted-password*}**no enable password**

<i>Password</i>	EXEC	
<i>Level</i>		
<b>0 7</b>	0	7
<i>encrypted-password</i>		

> 1 26

>

r EXEC

pw10

Ruijie(config)# enable password pw10

enable secret	

-	-

## 2.1.4 enable secret

enable secret no

**enable secret** [*level level*] {*secret* | [0 | 5] *encrypted-secret*}

**no enable secret**

<i>Secret</i>	EXEC
<i>Level</i>	
<b>0 5</b>	0 5
<i>encrypted-password</i>	



---

|

|

|

|

**no enable service**

enable service ssh-sesrver, SSH Server

Ruijie(Config # **enable service ssh-sesrver**



---

## **Telnet**

configure terminal

line tty 1 16

---

enable

Web

**no ip http authentication**

Web

local

Ruijie(config)# **ip http authentication local**

**enable service**

---


### 2.1.9 ip telnet source-interface

	IP	Telnet	
<b>telnet source-interface</b>			
<b>ip telnet source-interface interface-name</b>			
<i>interface-name</i>	IP	Telnet	

	IP	Telnet	
Telnet			
<b>no ip telnet source-interface</b>			

	Loopback 1	IP	Telnet
Ruijie(config)# <b>ip telnet source-interface Loopback 1</b>			
<b>telnet</b>	Telnet		

10.4(2)			

### 2.1.10 lock

---

EXEC

lock

lock

-	-

|

|

|

> lock

>

Locked

>

line

lockable

line

|

Ruijie(config-line)# lockable

Ruijie(config-line)# end

Ruijie# lock

Password: <password>

Again: <password>

Locked

Password: <password>

|

lockable	

|

|

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## 2.1.11 lockable

**lock**                      **lock**                      **no**                      **line**                      **lockable**  
**lockable**  
**no lockable**

	-		-

┌

┌ line

┌ **lock**

EXEC

```

Ruijie(config)# line console 0
Ruijie(config-line)# lockable
Ruijie(config-line)# end
Ruijie# lock
Password: <password>
Again: <password>
Locked
Password: <password>

```

	<b>lock</b>		

---

**login**

**no login**

	-	-

|

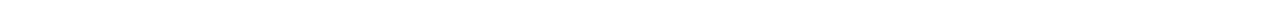
| line

| AAA  
| VTY console

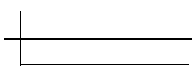
---

```
VTY
Ruijie(config)# no aaa new-model
Ruijie(config)# line vty 0
Ruijie(config-line)# password 0 normatest
Ruijie(config-line)# login
```

<b>password</b>		line



line



---

username

VTY

Ruijie(config)# **no aaa new-model**

Ruijie(config)# **username test password 0 test**

Ruijie(config)# **line vty 0**

Ruijie(config-line)# **login local**

<b>username</b>	

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### 2.1.15 privilege mode

CLI

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CLI

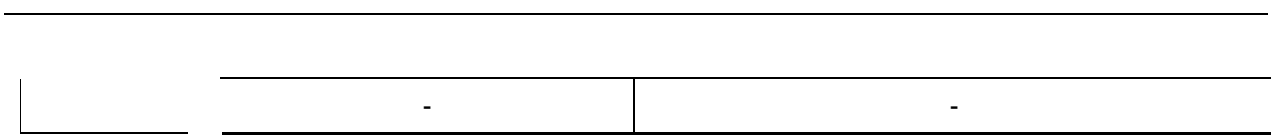
CLI

CLI

CLI

-	-

--	--



### 2.1.16 password

line

line

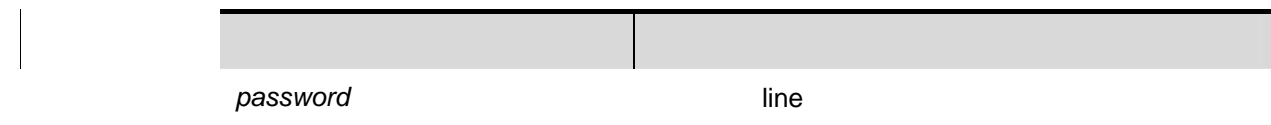
**password**

**no**

line

**password** {*password* | [0-7] *encrypted-password*}

**no password**



*password*

line

---

**service password-encryption**

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<b>interface</b> <i>interface-name</i>	Telnet
<b>!vrf</b> <i>vrf-name</i>	VRF

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telnet		
<b>r</b>	<b>/ipv6</b>	IPV6

┌

```

1          telnet          IPV4          192.168.1.1
          vlan 1          VRF          vpn1
Ruijie# telnet 192.168.1.1 /source interface vlan 1 /vrf vpn1
2          telnet          IPV6          2AAA:BBBB::CCCC
Ruijie# telnet 2AAA:BBBB::CCCC

```

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<b>ip telnet source-interface</b>	IP      Telnet
<b>show session</b>	TTY
<b>exit</b>	

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## 2.1.19 username

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<i>password</i>	
<b>07</b>	0 7
<i>encrypted-password</i>	
<i>privilege-level</i>	

	<i>message</i>	
	Ruijie(config) Ruijie(config)# <b>banner login</b> \$ <i>enter your password</i> \$	
	-	-
	-	-

## 2.2.2 banner motd

	no banner motd	banner motd
	<b>banner motd</b> <i>c message c</i>	
	<i>c</i>	
	<i>message</i>	



```

Ruijie#show boot system
system boot file: flash:/rgos.bin

Ruijie#dir
Directory of flash:/
 11015744 2008-01-01 08:00:46  rgos.bin
 12019754 2008-02-01 08:00:46  s5750_10_4.bin
    399 2006-01-01 08:01:37  config.text
33,030,144 bytes total. (10,590,592 bytes free)

Ruijie(config)# boot system s5750_10_4.bin
Ruijie(config)# show boot system
system boot file: flash:/ s5750_10_4.bin
                        s5750_10_4.bin

```

<b>show boot system</b>	

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-	-

## 2.2.4 clock set

### clock set

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

<i>hh:mm:ss</i>	24 : :
<i>day</i>	1-31
<i>month</i>	1-12
<i>year</i>	1993-2035

---

|

|

|

clock set

|

2003 3 17 10 20 30

Ruijie# **clock set** 10:20:30 3 17 2003

Ruijie# **show clock**

clock: 2003-3-17 10:20:32

|

<b>show clock</b>	

|

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## 2.2.5 clock update-calendar

**clock update-calendar**

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calendar

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```
Ruijie# clock update-calendar
```



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```

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|
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|
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```

```

10
Ruijie# reload in 10
Router will reload in 600 seconds.

```

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```

|
|

```

-	-

## 2.2.10 session-timeout

```

LINE session-timeout
no session-timeout LINE
session-timeout minutes [output]
no session-timeout

```

<i>minutes</i>	
<b>output</b>	

```

|
|

```

0 min

```

|
|

```

LINE

```

|
|

```

LINE  
LINE

```

|
|

```

line vty 0 5 30

---

```
Ruijie(config-line)# exec-timeout 5 30
```

-	-

-	-

## 2.2.11 speed

**speed speed**

**no speed**

**speed speed**

<i>Speed</i>	bps 9600 19200 38400 57600 115200 9600

9600

57600 bps

```
Ruijie(config)# line console 0
```

```
Ruijie(config-line)# speed 57600
```

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**2.2.12 write**

running-config

**write [ memory | network | terminal ]**

<b>memory</b>	NVRAM running-config startup-config	<b>copy</b>
<b>network</b>	TFTP running-config tftp	<b>copy</b>

```

[Failed]
The device [usb1] does not exist, write to the default config file
[/config.text]? [no] yes
Write to the default config file: [/config.text]
[OK]

```

<b>boot config</b>	
<b>copy</b>	
<b>show running-config</b>	

-	-

## 2.3

### 2.3.1 show clock

**show clock**

**show clock**

-	-

detail

**show clock**

```

Ruijie# show clock
clock: 2003-3-17 10:27:21

```

<b>clock set</b>	
-	-

### 2.3.2 show line

#### show line

**show line** [*console line-num* | *aux line-num* | *vty line-num* | *line-num*]

<b>console</b>	
<b>aux</b>	aux
<b>vty</b>	vty
<i>line-num</i>	line

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

```

          console
Ruijie# show line console 0
CON   Type   speed  Overruns
* 0   CON    9600   45927
Line 0, Location: "", Type: "vt100"
Length: 24 lines, Width: 79 columns
Special Chars: Escape Disconnect Activation
                ^^x   none      ^M
Timeouts:      Idle EXEC   Idle Session
                never     never
History is enabled, history size is 10.

```

---

```
Total input: 53564 bytes
Total output: 395756 bytes
Data overflow: 27697 bytes
stop rx interrupt: 0 times
```

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### 2.3.3 show reload

**show reload**

**show reload**

-	-

```
Ruijie# show reload
Reload scheduled in 595 seconds.
At 2003-12-29 11:37:42
Reload reason: test.
```

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### 2.3.4 show running-config

show running-config

show running-config

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!

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By Ruijie Network

System start time: 1970-6-14 11:49:53

System uptime: 3:17:1:17

System hardware version: 2.0

System software version: RGOS 10.3.00(4), Release(34679)

System boot version: 10.2.34077

System CTRL version: 10.2.24136

System serial number: 1234942570001

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-	-

## 3 LINE

### 3.1 LINE

#### 3.1.1 access-class

Line ACL **access-class** *acl-no* { **in** | **out** }  
Line no **access-class** *access-list-number* { **in** | **out** }  
LINE ACL  
[no] **access-class** *access-list-number* { **in** | **out** }

LINE

	-	-

### 3.1.2 line

LINE

**line** [**aux** | **console** | **tty** | **vty**] *first-line* [*last-line*]

<b>aux</b>		
<b>console</b>		
<b>tty</b>		
<b>vty</b>		telnet/ssh
<i>First-line</i>		first-line
<i>Last-line</i>		last-line

|

|

|

LINE

|

```
LINE VTY 1 3 LINE
Ruijie(config)# line vty 1 3
```

	-	-

|

	-	-

### 3.1.3 line vty

VTY

no

VTY

**line vty** *line-number*

**no line vty** *line-number*

-	-

	VTY	5	0--4
--	-----	---	------

--	--	--

	VTY	
--	-----	--

1	VTY	20	VTY	0--19
Ruijie(config)# <b>line vty 19</b>				
2	VTY	10	VTY	0—9
Ruijie(config)# <b>line vty 10</b>				

-	-

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-	-

### 3.1.4 transport input

Line	<b>transport input</b>	Line
<b>default transport input</b>	LINE	

**transport input** {all | ssh | telnet | none}

**default transport input**

<b>all</b>	Line
<b>ssh</b>	Line      SSH

LINE

<b>telnet</b>	Line	Telnet
<b>none</b>	Line	

VTY TTY NONE  
**default transport input**

Line

Line VTY VTY **show**  
**running** Line  
**/ input default transport input no transport**  
**transport input none**

```

line vty 0 4 telnet
Ruijie# configure terminal
Ruijie(config)# line vty 0 4
Ruijie(config-line)# transport input telnet

```

<b>show running</b>	
---------------------	--

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# 4

## 4.1

### 4.1.1 ping

**ping** [*vrf vrf-name*] [*ip*] [*ip-address* [*length length* ]] [*ntimes times*] [*timeout seconds*] [*data data*] [*source source*] [*df-bit*] [*validate*]



## DNS

```
1 ping
Ruijie# ping 192.168.5.1
Sending 5, 100-byte ICMP Echoes to 192.168.5.1, timeout is 2 seconds:
 < press Ctrl+C to break >
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/2/10
ms

2 ping
Ruijie# ping 192.168.5.197 length 1500 ntimes 100 timeout 3 data ffff
source 192.168.4.10
Sending 100, 1000-byte ICMP Echoes to 192.168.5.197, timeout is 3
seconds:
 < press Ctrl+C to break >
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
Success rate is 100 percent (100/100), round-trip min/avg/max = 2/2/3
ms
```

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-	-

### 4.1.2 ping ipv6

**ping [ipv6] [ip-address [length length ] [ntimes times] [timeout seconds] [data data] [source source]]**

ip-address	IPv6

<i>length</i>	
<i>times</i>	
<i>seconds</i>	
<i>data</i>	
<i>source</i>	IPv6 ::1

2                    5                    100Byte                    IP

```

Ping ipv6
  ping ipv6
  ping ipv6
  2            5            100Byte            IP
  '!'                    ':'
    'C'
    ping
ping ipv6
  ping ipv6
  ping ipv6
  
```

	-	-
	ipv6	
	-	-

### 4.1.3 traceroute

traceroute

**traceroute** [**vrf**] [*vrf-name*] [**ip** *ip-address*][*ip-address* [**probe** *number* ] [**source** *source*] [**timeout** *seconds*] [**ttl** *minimum maximum*]

<i>vrf-name</i>	VRF
<i>ip-address</i>	IPv4
<i>number</i>	
<i>source</i>	IPv4 127.0.0.1
<i>seconds</i>	
<i>minimum maximum</i>	

```

2      192.168.9.2      4 msec  4 msec  4 msec
3      192.168.9.1      8 msec  8 msec  4 msec
4      192.168.0.10     4 msec  28 msec 12 msec
5      202.101.143.130  4 msec  16 msec  8 msec
6      202.101.143.154 12 msec  8 msec  24 msec
7      61.154.22.36    12 msec  8 msec  22 msec
                                     IP      61.154.22.36
1 6

```

2 traceroute

```

Ruijie# traceroute 202.108.37.42
< press Ctrl+C to break >
Tracing the route to 202.108.37.42
1      192.168.12.1     0 msec  0 msec  0 msec
2      192.168.9.2      0 msec  4 msec  4 msec
3      192.168.110.1    16 msec 12 msec 16 msec
4      * * *
5      61.154.8.129    12 msec 28 msec 12 msec
6      61.154.8.17     8 msec 12 msec 16 msec
7      61.154.8.250    12 msec 12 msec 12 msec
8      218.85.157.222  12 msec 12 msec 12 msec
9      218.85.157.130  16 msec 16 msec 16 msec
10     218.85.157.77   16 msec 48 msec 16 msec
11     202.97.40.65    76 msec 24 msec 24 msec
12     202.97.37.65    32 msec 24 msec 24 msec
13     202.97.38.162   52 msec 52 msec 224 msec
14     202.96.12.38    84 msec 52 msec 52 msec
15     202.106.192.226 88 msec 52 msec 52 msec
16     202.106.192.174 52 msec 52 msec 88 msec
17     210.74.176.158 100 msec 52 msec 84 msec
18     202.108.37.42   48 msec 48 msec 52 msec
                                     IP      202.108.37.42
1 17 4

```

```

Ruijie# traceroute www.ietf.org
Translating " www.ietf.org "...[OK]
< press Ctrl+C to break >
Tracing the route to 64.170.98.32
1      192.168.217.1    0 msec  0 msec  0 msec
2      10.10.25.1       0 msec  0 msec  0 msec

```

```

3      10.10.24.1      0 msec  0 msec  0 msec
4      10.10.30.1     10 msec  0 msec  0 msec
5      218.5.3.254    0 msec  0 msec  0 msec
6      61.154.8.49    10 msec  0 msec  0 msec
7      202.109.204.210 0 msec  0 msec  0 msec
8      202.97.41.69   20 msec  10 msec  20 msec
9      202.97.34.65   40 msec  40 msec  50 msec
10     202.97.57.222   50 msec  40 msec  40 msec
11     219.141.130.122 40 msec  50 msec  40 msec
12     219.142.11.10  40 msec  50 msec  30 msec
13     211.157.37.14  50 msec  40 msec  50 msec
14     222.35.65.1    40 msec  50 msec  40 msec
15     222.35.65.18   40 msec  40 msec  40 msec
16     222.35.15.109  50 msec  50 msec  50 msec
17     *      *      *
18     64.170.98.32   40 msec  40 msec  40 msec

```

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#### 4.1.4 traceroute ipv6

traceroute ipv6

**traceroute [ipv6 ip-address] [probe number] [timeout seconds] [ttl minimum maximum]**

<i>ip-address</i>	IPv6
<i>number</i>	
<i>seconds</i>	
<i>minimum maximum</i>	TTL

Traceroute ipv6

DNS

traceroute ipv6

```
1          traceroute ipv6
Ruijie# traceroute ipv6 3004::1
< press Ctrl+C to break >
Tracing the route to 3004::1
 1    3000::1      0 msec  0 msec  0 msec
 2    3001::1      4 msec  4 msec  4 msec
 3    3002::1      8 msec  8 msec  4 msec
 4    3004::1      4 msec  28 msec 12 msec
                                     IP    3004::1
                                     1 4
```

```
2          traceroute ipv6
Ruijie# traceroute ipv6 3004::1
< press Ctrl+C to break >
Tracing the route to 3004::1
 1    3000::1      0 msec  0 msec  0 msec
 2    3001::1      4 msec  4 msec  4 msec
 3    3002::1      8 msec  8 msec  4 msec
 4    * * *
 5    3004::1      4 msec  28 msec 12 msec
                                     IP    3004::1
                                     1 5          4
```

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- -

---

# 5

## 5.1

### 5.1.1 carrier-delay

**carrier-delay**

**no**

**carrier-delay** [ *seconds* ]

**no carrier-delay**

<i>seconds</i>		1 60

2

DCD    DCD    Down        Up

DCD

DCD

DCD

	-	-
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### 5.1.2 clear counters

**clear counters** [*interface-id*]

	<i>interface-id</i>	

|

|

	<b>show interfaces</b>	<b>clear</b>
<b>counters</b>		

Ruijie# **clear counters gigabitethernet 1/1**

	<b>show interfaces</b>	

|

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### 5.1.3 clear interface

**clear interface** *interface-id*

	<i>interface-id</i>	

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Switch Port,L2 Aggregate port ,Routed port,L3 Aggregate port  
**shutdown no shutdown**

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Ruijie# **clear interface gigabitethernet 1/1**

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<b>shutdown</b>	

┌

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### 5.1.4 description

no

**description** *string*

**no description**

┌

<i>string</i>	

┌

┌

┌

**show interfaces**

┌

Ruijie(config)# **interface gigabitethernet 1/1**  
Ruijie(config-if)# **description GBIC-1**

┌

<b>show interfaces</b>	

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### 5.1.5 duplex

no

**duplex {auto | full | half}**

**no duplex**

	<b>auto</b>	
	<b>full</b>	
	<b>half</b>	

└──

└──

└──

**show interfaces**

└──

Ruijie(config-if)# **duplex full**

--	--	--

no

**flowcontrol {auto | off | on}**

**no flowcontrol**

<b>auto</b>	
<b>off</b>	
<b>on</b>	

└───┘

└───┘

└───┘

**show interfaces**

└───┘

1/1

Ruijie(config)# **interface gigabitethernet 1/1**

Ruijie(config-if)# **flowcontrol on**

<b>show interfaces</b>	

└───┘

-	-

## 5.1.7 interface aggregateport

no

**interface aggregateport *port-number***

<i>port-number</i>	Aggregate port

└───┘

---

|

|

aggregate port    aggregate port  
aggregate port    **show**  
**interfaces    show interfaces aggregateport**

|

Ruijie(config)# **interface aggregateport 3**  
Ruijie(config-if)#

|

<b>show interfaces</b>	

|

-

|

-	-

## 5.1.8 interface fastEthernet

**interface fastEthernet** *mod-num/port-num*

|

--	--

*mod-num/port-num*

/

---

	<b>show interfaces</b>	

┌

-

	-	-

### 5.1.9 interface giagbitEthernet

**interface gigabitEthernet** *mod-num/port-num*

	<i>mod-num/port-num</i>	/

┌

┌

**no**

10G

**interface tenGigabitEthernet** *mod-num/port-num*

<i>mod-num/port-num</i>	/

|

|

|

**no**  
**tenGigabitEthernet**

**show interfaces**    **show interfaces**

|

Ruijie(config)# **interface tenGigabitEthernet** 1/2  
Ruijie(config-if)#

|

<b>show interfaces</b>	

|

|

-	-

### 5.1.11 interface vlan

switch virtual interface SVI

**no**            SVI

**interface vlan** *vlan-id*

**no interface vlan** *vlan-id*

|

<i>vlan-id</i>	VLAN ID

|

---

```
show interfaces show interfaces vlan
```

```
Ruijie(config)# interface vlan 2
Ruijie(config-if)#
```

```
show interfaces
```

```
-
```

```
-
```

```
-
```

## 5.1.12 line-detect

```
line-detect
```

```
line-detect
```

```
line-detect
```

```
Ruijie(config)#interface gigabitEthernet 0/1
Ruijie(config-if-GigabitEthernet 0/1)#line-detect
Interface : GigabitEthernet 0/1
start! TAs-deiagnoses,please wait...
sTAs-deaignoses end!this is result:
s4 pairs
```

C Short 1  
 pair state length(meters)

-----

D Short 1

pairs	
state	OK Short Open A B OK C D Short A B C D OK
length	state OK Short Open length



---

	-	-

**5.1.15 shutdown**

## 5.1.16 snmp trap link-status

	SNMP	LinkTrap,	LinkTrap	no	SNMP	Link
LinkTrap						
	<b>snmp trap link-status</b>					
	<b>no snmp trap link-status</b>					



Link SNMP LinkTrap

Ap SVI LinkTrap

```

1 Link trap
Ruijie(config)# interface gigabitEthernet 1/1
Ruijie(config-if)# no snmp trap link-status 2 Link trap
Ruijie(config)# interface gigabitEthernet 1/1
Ruijie(config-if)# snmp trap link-status 2 Link trap

```



```

Ruijie(config-if)# snmp trap link-status link trap
Ruijie(config-if)# no snmp trap link-status link trap

```



- -



## 5.1.17 speed



	-	-
	2	
	switchport	
	2	2 3
	Ruijie(config-if)# <b>switchport</b>	
	<b>show interfaces</b>	
	-	
	-	-

### 5.1.19 switchport access

	no	access port	VLAN
		VLAN	
	<b>switchport access vlan <i>vlan-id</i></b>		
	<b>no switchport access vlan</b>		
	<i>vlan-id</i>	VLAN	ID
	switch port	access	VLAN VLAN 1
	VLAN ID	VLAN ID	VLAN
	VLAN	VLAN ID	VLAN
		trunkport	

```
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# switchport access vlan 2
```

<b>switchport mode</b>	switch port
<b>switchport trunk</b>	trunkport native VLAN Trunk VLAN

-	-

### 5.1.20 switchport mode

trunk port, 802.1Q switch port **no** access port

**switchport mode {access | trunk}**

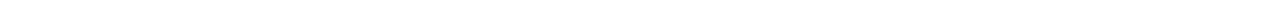
**no switchport mode**

<b>access</b>	switch port access port
<b>trunk</b>	switch port trunk port

switch port access

switch port access VLAN  
**switchport access vlan** VLAN  
switch port trunk VLAN  
VLAN VLAN trunk port VLAN  
VLAN **switchport trunk** VLAN





**Native VLAN**

Trunk  
UNTAG

native VLAN  
VLAN

native VLAN



---

## 5.2.1 show interfaces

**show interfaces** [*interface-id*] [**counters** | **description** | **status** | **switchport** | **trunk** | **transceiver** [**alarm** | **diagnosis**]]

<i>interface-id</i>	loopback aggregateport SVI
<b>counters</b>	
<b>description</b>	link
<b>status</b>	
<b>switchport</b>	

---

<b>shutdown</b>	
<b>speed</b>	
<b>switchport priority</b>	802.1q
<b>switchport protected</b>	

---

-	-

---

# 6 Aggregate Port

## 6.1

### 6.1.1 aggregateport load-balance

AP no

**aggregateport load-balance {dst-mac | src-mac | src-dst-mac | dst-ip | src-ip | src-dst-ip }**

**no aggregateport load-balance**

<b>dst-mac</b>	MAC	MAC	AP
<b>src-mac</b>	MAC	MAC	AP
<b>src-dst-ip</b>	IP	IP	IP— IP—
<b>dst-ip</b>	IP	IP	AP
<b>src-ip</b>	IP	IP	AP
<b>src-dst-mac</b>	MAC—	MAC—	

MAC

**show aggregateport load-balance**

Ruijie(config)# **aggregateport load-balance dst-mac**

<b>show aggregateport load-balance</b>	aggregateport

-

-	-

### 6.1.2 port-group

Aggregate Port

no

Aggregate Port

**port-group** *port-group-number*

**no port-group**

<i>port-group-number</i>	Aggregate Port Port                      Aggregate

Aggregate Port

AP                      VLAN                      trunk port                      native  
VLAN                      AP

1/3                      AP 3

Ruijie(config)# **interface gigabitethernet 1/3**

Ruijie(config-if)# **port-group 3**

-	-

	-	
	-	-

**6.2**

e9(eg-9(eg))1(-5pte Port)

# 7 VLAN

## 7.1

### 7.1.1 name

VLAN **no**

**name** *vlan-name*

**no name**

	<i>vlan-name</i>	VLAN

VLAN	VLAN	VLAN ID	VLAN 2	"VLAN0002"
------	------	---------	--------	------------

VLAN		
------	--	--

<b>show vlan</b>	vlan	
------------------	------	--

```
Ruijie(config)# vlan 10
Ruijie(config-vlan)# name vlan10
```

<b>show vlan</b>		VLAN

--	--	--

-		-

### 7.1.2 switchport access

**no** access port VLAN VLAN

**switchport access vlan *vlan-id***

**no switchport access vlan**

<b>access</b>	switch port	access port
<b>trunk</b>	switch port	trunk port
<b>hybrid</b>	switch port	hybrid port

**no switchport trunk {allowed vlan | native vlan }**

<b>allowed vlan</b> <i>vlan-list</i>	Trunk	VLAN	vlan-list	
	VLAN		VLAN	
	VLAN ID	VLAN ID	-	
	10-20		,	
	1-10,20-25,30,33			
	all	VLAN	VLAN	
add	VLAN	VLAN		
remove	VLAN	VLAN		
except	VLAN	VLAN		
	VLAN			
<b>native vlan</b> <i>vlan-id</i>	Native VLAN			

VLAN all Native VLAN VLAN 1

**Native VLAN**

```

Trunk native VLAN native VLAN
  UNTAG VLAN VLAN ID
IEEE 802.1Q PVID native VLAN VLAN ID Trunk
native VLAN UNTAG
VLAN
Trunk VLAN 1 4094
  Trunk VLAN VLAN Trunk
  
```

**show interfaces switchport**

```

VLAN 2 1/15
Ruijie(config)# interface fastethernet 1/15
Ruijie(config-if)# switchport trunk allowed vlan remove 2
Ruijie(config-if)# end
Ruijie# show interfaces fastethernet1/15 switchport
Interface Switchport Mode Access Native Protected VLAN lists
-----
FigabitEthernet 1/15 enabled TRUNK 1 1 Disabled 1,3-4094
  
```

--	--	--

VLAN

-	-
---	---

## 7.2

### 7.2.1 show vlan

VLAN

**show vlan [id vlan-id]**

<i>vlan-id</i>	VLAN ID
----------------	---------

|

|

|

**end**

**Ctrl+C**

**exit**

Ruijie# **show vlan id 1**  
VLAN Name  
-----  
1 VLAN0001

Status

Ports

STATIC

Fa0/1, Fa0/2

|

name	VLAN
switchport access	Vlan

|

|

-	-
---	---

# 8 Super-vlan

## 8.1

### 8.1.1 subvlan

super vlan    subvlan            subvlan

**subvlan** *vlan-id-list*

**no subvlan** [*vlan-id-list*]

<i>Vlan-id-list</i>	VLAN    subvlan    ID,            vlan

┌

┌

VLAN

┌

**no subvlan**            supevlan            subvlan

```
Ruijie(config)# vlan 3
Ruijie(config-vlan)# supervlan
Ruijie(config-vlan)# subvlan 5
Ruijie(config-vlan)# subvlan 7-19
```

<b>show supervlan</b>	supervlan

┌

-	-

### 8.1.2 subvlan-address-range

subvlan ip

**subvlan-address-range** *start-ip end-ip*

**no subvlan-address-range**

<i>start-ip</i>	SubVLAN	IP
<i>end-ip</i>	SubVLAN	IP

-

VLAN

**end**                      **Ctrl+C**  
**exit**

```
Ruijie(config)# vlan 3
Ruijie(config-vlan)# subvlan-address-range 192.168.3.10
192.168.3.100
```

<b>show supervlan</b>	supervlan

-	-

### 8.1.3 supervlan

VLAN                      **supervlan**

**supervlan**

**no supervlan**

-	-

|

| VLAN

| **end** **Ctrl+C**  
| **exit**

| Ruijie(config)# **vlan 3**  
| Ruijie(config-vlan)# **supervlan**

<b>show supervlan</b>	supervlan

|

-	-

### 8.1.4 proxy-arp

VLAN ARP

**proxy-arp**

**no proxy-arp**

-	-

|

| VLAN

| **end** **Ctrl+C**  
| **exit**

```
Ruijie(config)# vlan 3  
Ruijie(config-vlan)# proxy-arp
```

```
show supervlan
```

supervlan	
-	-

## 8.2

### 8.2.1 show supervlan

SuperVLAN

SubVLAN

1wP EavgjTm, V 7a ArcBNM1TcBNR808N





```

|
|
|
|

```

```
Ruijie(config)# protocol-vlan profile 1 frame-type ETHERII
ether-type aarp
```

show protocol-vlan profile	-
show protocol-vlan profile num	-
no protocol-vlan profile	-
no protocol-vlan profile num	-

```

|

```

RGOS10.1

```

|
|

```

-	-

### 9.1.3 protocol-vlan profile num vlan id

profile

```

|
|
|
|
|

```

num	profile
id	VLAN ID 1- VLAN

```

|

```

```
Ruijie(config-if)# protocol-vlan profile 1 vlan 101
```

<b>show protocol-vlan profile</b>	-
<b>show protocol-vlan profile <i>num</i></b>	-
<b>no protocol-vlan profile</b>	-
<b>no protocol-vlan profile <i>num</i></b>	-

RGOS10.1



Protocol VLAN

---

	-	-
--	---	---

---



**private-vlan mapping** {*svlist* | **add** *svlist* | **remove** *svlist*}

**no private-vlan mapping**

<i>svlist</i>	secondary VLAN list
<b>no</b>	

┌

┌ Primary VLAN

┌

```
Ruijie(config)# interface vlan 22
Ruijie(config-if)# private-vlan mapping add 24-26
```

<b>show vlan private-vlan</b>	-

┌ RGOS10.1

-	-

### 10.1.3 private-vlan type

VLAN VLAN

**private-vlan** {*community* | *isolated* | *primary*}

**no private-vlan** {*community* | *isolated* | *primary*}

<i>community</i>	community VLAN
<i>isolated</i>	isolated VLAN
<i>primary</i>	primary VLAN
<i>no</i>	VLAN



	<b>show vlan private-vlan</b>	-
	RGOS10.1	
	-	-

### 10.1.5 switchport private-vlan host-association

private VLAN

primary VLAN

secondary VLAN

**switchport private-vlan host-association** *p\_vid s\_vid*

**no switchport private-vlan host-association**

	<i>p_vid</i>	primary VID
	<i>s_vid</i>	secondary VID
	<b>no</b>	VLAN



**show vlan private-vlan [community | primary | isolated]**

<b>primary</b>	primary VLAN
<b>community</b>	community VLAN
<b>isolated</b>	isolated VLAN

private VLAN

Ruijie# **show vlan private-vlan**

-	-

RGOS10.1

-	-

## 10.3 Hybrid

### 10.3.1 switchport hybrid allowed vlan

**switchport hybrid allowed vlan**[[add][tagged | untagged] | remove] *vlist*

**no switchport hybrid allowed vlan**

hybrid

<b>no</b>	hybrid

|

|

|

Ruijie(config-if)# **switchport hybrid allowed vlan add untagged 3-5**

|

-	-

|

RGOS10.1

|

-	-

### 10.3.2 switchport hybrid native vlan

**switchport hybrid native vlan *vid***

**no switchport hybrid native vlan**

hybrid                  vlan

|

<b>no</b>	hybrid    VLAN

|

|

|

|

Ruijie(config-if)# **switchport hybrid native vlan 3**

|

-	-

|

RGOS10.1

--	--	--

# 11 802.1Q Tunneling

## 11.1

### 11.1.1 frame-tag tpid tpid

tpid

**frame-tag tpid** <tpid>

**no frame-tag tpid**

	<b>no</b>	

┌

┌

┌

```
Ruijie(config)# interface g0/3
Ruijie(config-if)# frame-tag tpid 9100
Ruijie(config-if)# end
Ruijie# show frame-tag tpid
Port      tpid
-----  -
Gi0/3     0x9100
```

	<b>show frame-tag tpid</b>	-

┌

RGOS10.1

	-	-

## **11.1.2 inner-priority-trust enable**

802.1Q tunneling

```
Ruijie(config)# interface gi 0/1
Ruijie(config-if)# switchport access vlan 22
Ruijie(config-if)# switchport mode dot1q-tunnel
Ruijie(config)# end
```

<b>show vlan private-vlan</b>	-

RGOS10.1

-	-

### 11.1.4 switchport mode uplink

uplink

**switchport mode uplink**

**no switchport mode**

<b>no</b>	uplink

uplink

```
Ruijie(config)# interface gigabitEthernet 0/1
Ruijie(config-if)# switchport mode up-link
Ruijie(config)# end
```

	<b>show vlan private-vlan</b>	-
	RGOS10.1	
	-	-

## 11.2

### 11.2.1 show frame-tag tpid

private VLAN

**show frame-tag tpid [interface <interface>]**



	-	-

## 11.2.2 show inner-priority-trust

### show inner-priority-trust

	-	-

|

|

|

```
Ruijie# show inner-priority-trust
Port    inner-priority-trust
----    -
Gi0/1   enable
```

	-	-

|

RGOS10.1

	-	-

# 12 Share VLAN

## 12.1

### 12.1.1 share

```
share vlan
```

	-	-

```
vlan
```

```
share vlan no share
```

```
end Ctrl+C
```

```
exit
```

```
Ruijie(config)#vlan 2
```

```
Ruijie(config-vlan)#share
```

	-	-

	-	-

## 12.2

### 12.2.1 show mac-address-table share

	Status	duplicated share vlan	Status	original	Status
		-		-	

|

|

~

# 13 MAC

## 13.1

### 13.1.1 address-bind

ip mac

**address-bind** *ip-address mac-address*

**no address-bind** *ip-address*

<i>ip-address</i>	IP
<i>mac-address</i>	mac

┌

┌

	IP		MAC		IP	IP
		MAC		IP	MAC	

Ruijie(config)#

```

    ip      3.3.3.3  mac    00d0.f811.1112
    Ruijie(config)# address-bind 3.3.3.3 00d0.f811.1112
  
```

<b>show address-bind</b>	

-

-	-

### 13.1.2 address-bind install

/

**address-bind install**

**no address-bind install**



|

|

|

IP MAC IP MAC IP IP  
MAC IP MAC

ip 3.3.3.3 mac 00d0.f811.1112  
Ruijie(config)# **address-bind 3.3.3.3 00d0.f811.1112**



	Ipv4
	IPV4+MAC
	IPV4+MAC
	IPV4+MAC

	IPV6	
	ipv6	
	IPV6	
	MAC	MAC IPV6

```

IP      192.168.5.2      00d0.f822.33aa
IPV6
Ruijie# configure t
Enter configuration commands, one per line. End with CNTL/Z.
Ruijie(config)# address-bind 00d0.f822.33aa ip 192.168.5.2
Ruijie(config)# address-bind ipv6-mode compatible
    
```

-	-

-	-



```
Ruijie# clear mac-address-table dynamic
```

<b>show mac-address-table dynamic</b>	

-	-

### 13.1.7 clear mac-address-table filtering

**clear mac-address-table filtering** [**address** *mac-addr*] [**vlan** *vlan-id*]

<b>filtering</b>	
<b>address</b> <i>mac-addr</i>	
<b>vlan</b> <i>vlan-id</i>	VLAN

```
show mac-address-table filtering
```

```
00d0.f800.0c0c
```

```
Ruijie# clear mac-address-table filtering address 00d0.f800.0c0c
```

<b>mac-address-table filtering</b>	
<b>show mac-address-table filtering</b>	



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

<i>seconds</i>	

300

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

Ruijie(config)# **mac-address-table aging-time 150**

<b>show mac-address-table aging-time</b>	

**show mac-address-table filtering**

Ruijie(config)# **mac-address-table filtering 00d0f8000000 vlan 1**

<b>clear mac-address-table filtering</b>	
<b>show mac-address-table filtering</b>	

-	-

### 13.1.11 mac-address-table notification

MAC **no**

**mac-address-table notification [interval *value* | history-size *value*]**

**no mac-address-table notification [interval | history-size]**

<b>interval <i>value</i></b>	MAC	Trap	1
<b>history-size <i>value</i></b>	MAC		50

1 50

MAC **snmp-server enable traps mac-notification** Trap  
 MAC Trap

Ruijie(config)# **mac-address-table notification**  
 Ruijie(config)# **mac-address-table notification interval 40**  
 Ruijie(config)# **mac-address-table notification history-size 100**



<b>show mac-address-table static</b>	
<b>clear mac-address-table static</b>	

-

-	-

### 13.1.13 snmp trap mac-notification

MAC no

**snmp trap mac-notification {added | removed}**

**no snmp trap mac-notification {added | removed}**

<b>added</b>	
<b>removed</b>	

**show mac-address-table notification *interface***

```
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# snmp trap mac-notification added
```

<b>mac-address-table notification</b>	MAC
<b>show mac-address-table notification</b>	MAC

--	--

	-	
	-	

### 13.1.14 mac-address-learning

/

mac-address-learning	
	MAC
1	Ruijie(config-if)# no mac-address-learning

## 13.2

### 13.2.1 show address-bind

show address-bind	

|

|

```
Ruijie# show address-bind
IP Address      Binding MAC Addr
-----
3.3.3.3         00d0.f811.1112
3.3.3.4         00d0.f811.1117
```

|

<b>address-bind</b>	

|

|

-	-

### 13.2.2 show address-bind uplink

#### show address-bind uplink

|


|

|

|

|

```
Ruijie# show address-bind uplink
Ports      State
-----
Fa0/1      Disabled
Fa0/2      Disabled
```

.....

address-bind uplink


-

-	-

### 13.2.3 show mac-address-table address

**show mac-address-table interface**

MAC

---

	-	-
--	---	---

### 13.2.5 show mac-address-table count

**show mac-address-table count**

--	--



### 13.2.7 show mac-address-table filtering

**show mac-address-table static** [*addr mac-addr*] [*vlan vlan-id*]

<i>mac-addr</i>	MAC
<i>vlan-id</i>	VLAN

|

|

|

```
Ruijie# show mac-address-table filtering
Vlan      MAC Address      Type      Interface
-----  -
1         0000.2222.2222  FILTER   Not available
```

<b>clear mac-address-table filtering</b>	
<b>mac-address-table filtering</b>	

|

-	-

### 13.2.8 show mac-address-table interface

**show mac-address-table interface** [*interface-id*] [*vlan vlan-id*]

<i>interface-id</i>	( AggregatePort)



<b>interface</b> <i>interface-id</i>	MAC
<i>history</i>	MAC

MAC
-----

```

Ruijie# show mac-address-table notification interface
Interface          MAC Added Trap  MAC Removed Trap
-----
GigabitEthernet1/14  Disabled        Disabled
Ruijie# show mac-address-table notification
MAC Notification Feature : Disabled
Interval between Notification Traps : 1 secs
Maximum Number of entries configured in History Table :1
Current History Table Length : 0
Ruijie# show mac-address-table notification history
History Index : 0
MAC Changed Message :
Operation:ADD Vlan : 1 MAC Addr: 00f8.d012.3456 GigabitEthernet 3/1
    
```

<b>mac-address-table notification</b>	MAC
<b>snmp trap mac-notification</b>	MAC

-	-
---	---

### 13.2.10 show mac-address-table static

**show mac-address-table static** [**addr** *mac-addr*] [**interface** *interface-id*] [**vlan** *vlan-id*]

<i>mac-addr</i>	MAC
<i>vlan-id</i>	VLAN
<i>interface-id</i>	( AggregatePort)

Ruijie# **show mac-address-table static**

Vlan	MAC Address	Type	Interface
-----	-----	-----	-----
1	00d0.f800.1001	STATIC	gigabitethernet 1/1
1	00d0.f800.1002	STATIC	gigabitethernet 1/1
1	00d0.f800.1003	STATIC	gigabitethernet 1/1

<b>mac-address-table static</b>	
<b>clear mac-address-table static</b>	

-	-

### 13.2.11 show mac-address-table vlan


VLAN

**show mac-address-table vlan [vlan-id]**

<i>vlan-id</i>	VLAN ID

```
Ruijie# show mac-address-table vlan 1
```

Vlan	MAC Address	Type	Interface
1	00d0.f800.1001	STATIC	gigabitethernet 1/1
1	00d0.f800.1002	STATIC	gigabitethernet 1/1
1	00d0.f800.1003	STATIC	gigabitethernet 1/1




1

Ruijie# show mac-address-learning


--

--


# 14 DHCP Snooping

## 14.1 DHCP snooping

### 14.1.1 ip dhcp snooping

```
DHCP Snooping                                no
      DHCP Snooping
```

**[no] ip dhcp snooping**

-	-

└───

└───

DHCP Snooping	show ip dhcp snooping	DHCP
snooping		
<b>r</b>	DHCP Snooping Private VLAN	

└───

```

DHCP snooping
Ruijie# configure terminal
Ruijie(config)# ip dhcp snooping
Ruijie(config)# end
Ruijie# show ip dhcp snooping

Switch DHCP snooping status    ENABLE
Verification of hwaddr field status  DISABLE
DHCP snooping database write-delay time: 0 seconds
DHCP snooping option 82 status: ENABLE
DHCP snooping Support Bootp bind status: ENABLE
Interface                Trusted    Rate limit (pps)
-----                -

```

--	--

	<b>show ip dhcp snooping</b>	DHCP snooping
	-	-

### 14.1.2 ip dhcp snooping bootp-bind

DHCP Snooping      Bootp  
no                      DHCP snooping      Bootp

**[no] ip dhcp snooping bootp-bind**

--	--	--

	<b>show ip dhcp snooping</b>	DHCP snooping

	-	-

**14.1.3 ip dhcp snooping database write-delay.00.5 ref292.58 154.38 1.5 102 0 0 5**

```

-----

```

<b>show ip dhcp snooping</b>	DHCP snooping

-	-

### 14.1.4 ip dhcp snooping database write-to-flash

DHCP Snooping

FLASH

#### ip dhcp snooping database write-to-flash

-	-

```


```

```


```

```


```

DHCP Snooping

FLASH

DHCP

flash

```

Ruijie# configure terminal
Ruijie(config)# ip dhcp snooping database write-to-flash
Ruijie(config)# end

```

-	-

```


```

```


```

--	--

	-	-
--	---	---

### 14.1.5 ip dhcp snooping information option

DHCP                      option82  
no

**[no] ip dhcp snooping information option**

	-	-

└───┘

└───┘

└───┘

DHCP                      option82      DHCP                      option82

```

DHCP                      option82
Ruijie# configure terminal
Ruijie(config)# ip dhcp snooping information option
Ruijie(config)# end
Ruijie# show ip dhcp snooping
Switch DHCP snooping status    ENABLE
Verification of hwaddr field status    DISABLE
DHCP snooping database write-delay time: 0 seconds
DHCP snooping option 82 status: ENABLE
    
```



[no] ip dhcp snooping verify mac-address

-	-

└───

└───

MAC DHCP	DHCP CLIENT CLIENT MAC	MAC	MAC
-------------	---------------------------	-----	-----

```

                DHCP      MAC
Ruijie# configure terminal
Ruijie(config)# ip dhcp snooping verify mac-address
Ruijie(config)# end
Ruijie# show ip dhcp snooping
Switch DHCP snooping status  ENABLE
Verification of hwaddr field status  ENABLE
DHCP snooping database write-delay time: 0 seconds
DHCP snooping option 82 status: ENABLE
DHCP snooping Support Bootp bind status: ENABLE
Interface                Trusted    Rate limit (pps)
-----                -

```

<b>show ip dhcp snooping</b>	DHCP snooping

└───

-	-

## 14.2 DHCP snooping

### 14.2.1 ip dhcp snooping limit rate

DHCP

no

**[no] ip dhcp snooping limit rate *rate-value***

<i>rate-value</i>	PPS[Packet Per Second]

```

DHCP Snooping    VLAN
                  CPP[CPU Protect Protocol]    CPP        DHCP
                  CPP                          DHCP Snooping
CPP
show ip dhcp snooping
    
```

```

          1          100pps
Ruijie# configure terminal
Ruijie(config)# interface fastEthernet 0/1
Ruijie(config-if)# ip dhcp snooping limit rate 100
Ruijie(config-if)# end
Ruijie# show ip dhcp snooping
Switch DHCP snooping status    ENABLE
Verification of hwaddr field status    DISABLE
DHCP snooping database write-delay time: 0 seconds
DHCP snooping option 82 status: ENABLE
DHCP snooping Support Bootp bind status: ENABLE
Interface                Trusted    Rate limit (pps)
-----                -
FastEthernet0/1          NO          100
    
```

<b>show ip dhcp snooping</b>	DHCP snooping

-	-

### 14.2.2 ip dhcp snooping suppression

suppression no  
no suppression

**[no] ip dhcp snooping suppression**

-	-

┌

┌

┌

DHCP

┌

```

fastethernet 0/2 suppression
Ruijie# configure terminal
Ruijie(config)# interface fastethernet 0/2
Ruijie(config-if)# ip dhcp snooping suppression
Ruijie(config-if)# end
    
```

┌

-	-

┌

┌

-	-

### 14.2.3 ip dhcp snooping trust

DHCP snooping                      TRUST  
no    UNTRUST

**[no] ip dhcp snooping trust**

-	-

UNTRUST

	DHCP	TRUST
DHCP	UNTRUST	DHCP

```

fastEthernet 0/1 TRUST
Ruijie# configure terminal
Ruijie(config)# interface fastEthernet 0/1
Ruijie(config-if)# ip dhcp snooping trust
Ruijie(config-if)# end
Ruijie# show ip dhcp snooping
Switch DHCP snooping status    ENABLE
Verification of hwaddr field status    DISABLE
DHCP snooping database write-delay time: 0 seconds
DHCP snooping option 82 status: ENABLE
DHCP snooping Support Bootp bind status: ENABLE
Interface                            Trusted            Rate limit (pps)
-----
FastEthernet0/1                      YES                unlimited
    
```



## **14.3 DHCP snooping**

### **14.3.1 show ip dhcp snooping**

┌

┌

-	-

### 14.3.2 show ip dhcp snooping binding

DHCP Snooping

**show ip dhcp snooping binding**

┌

-	-

┌

┌

┌

DHCP Snooping

```
Ruijie# show ip dhcp snooping binding
Total number of bindings: 1

MacAddress      IPAddress      Lease(sec)  Type         VLAN  Interface
-----
0000.0000.0001  1.1.1.1       78128      dhcp-snooping  1    FastEthernet 0/1
```

┌

<b>ip dhcp snooping binding</b>	DHCP snooping
<b>clear ip dhcp snooping binding</b>	DHCP snooping

┌

┌

--	--



### DHCP Snooping

**debug ip dhcp snooping {event | packet}**

?S\*BŠGSlqy"9BAè-qy\$GK"afR2—ir9BAÿ.+0Gix"af#GSg@hoS\*EŠGfXy Ag'9I?fX—(AjrB dB#GS

# 15 IGMP Snooping

## 15.1

### 15.1.1 deny

	profile	profile	deny
<b>deny</b>			
	<b>deny</b>	profile	
	profile	deny	
	profile		
	profile	range	profile
	profile		
		224.2.2.2	profile
	Ruijie(config)# <b>ip igmp profile 1</b>		
	Ruijie(config-profile)# <b>range 224.2.2.2</b>		
	Ruijie(config-profile)# <b>deny</b>		
	<b>ip igmp profile</b>	profile	
	<b>range</b>		
	-	-	

### 15.1.2 permit

profile profile permit profile

**permit**

<b>permit</b>	profile

profile deny

profile

profile range profile  
profile

224.2.2.2 profile  
Ruijie(config)# **ip igmp profile 1**  
Ruijie(config-profile)# **range 224.2.2.2**  
Ruijie(config-profile)# **permit**

<b>ip igmp profile</b>	profile
<b>range</b>	

-	-

### 15.1.3 range

profile profile range  
no

**range** *low-ip-address* [*high-ip-address*]  
**no range** *low-ip-address* [*high-ip-address*]



	<i>high-ip-address</i>	
--	------------------------	--

profile

profile profile profile deny

224.2.2.2~224.2.2.244 profile  
 Ruijie(config)# **ip igmp profile 1**  
 Ruijie(config-profile)# **range 224.2.2.2 224.2.2.244**

<b>ip igmp profile</b>	profile
<b>deny</b>	profile deny
<b>permit</b>	profile permit

-	-

### 15.1.4 ip igmp profile

IGMP profile profile  
 profile profile-number igmp profile

**ip igmp profile** *profile-number*

**no ip igmp profile** *profile-number*

<i>profile-number</i>	profile 1-65535

```

IGMP Profiles                               SVGL
IGMP Filtering                               profile
profile
    
```

```

1 profile profile
Ruijie(config)# ip igmp profile 1
Ruijie(config-profile)#
    
```

<b>range</b>	profile	
<b>permit</b>	profile	permit
<b>deny</b>	profile	deny

```

    
```

-	-

### 15.1.5 ip igmp snooping ivgl

```

igmp snooping ivgl ip igmp snooping ivgl
no igmp snooping
    
```

**ip igmp snooping ivgl**

**no ip igmp snooping**

-	-

```

disable
    
```

```

    
```

```

VLAN VLAN VLAN
VLAN
    
```

```

pim snooping          igmp snooping  IVGL  IVGL-SVGL
no ip igmp snooping  igmp snooping
pim snooping          pim snooping
    
```

```

Ruijie(config)# ip igmp snooping ivgl
    
```

<b>ip igmp snooping svgl</b>	igmp snooping	svgl
<b>ip igmp snooping ivgl-svgl</b>	igmp snooping	

```

    
```

-	-
---	---

### 15.1.6 ip igmp snooping ivgl-svgl

```

igmp snooping          ivgl-svgl          ip igmp snooping
ivgl-svgl              no                  igmp snooping
ip igmp snooping ivgl-svgl
no ip igmp snooping
    
```

-	-
---	---

```

disable
    
```

```

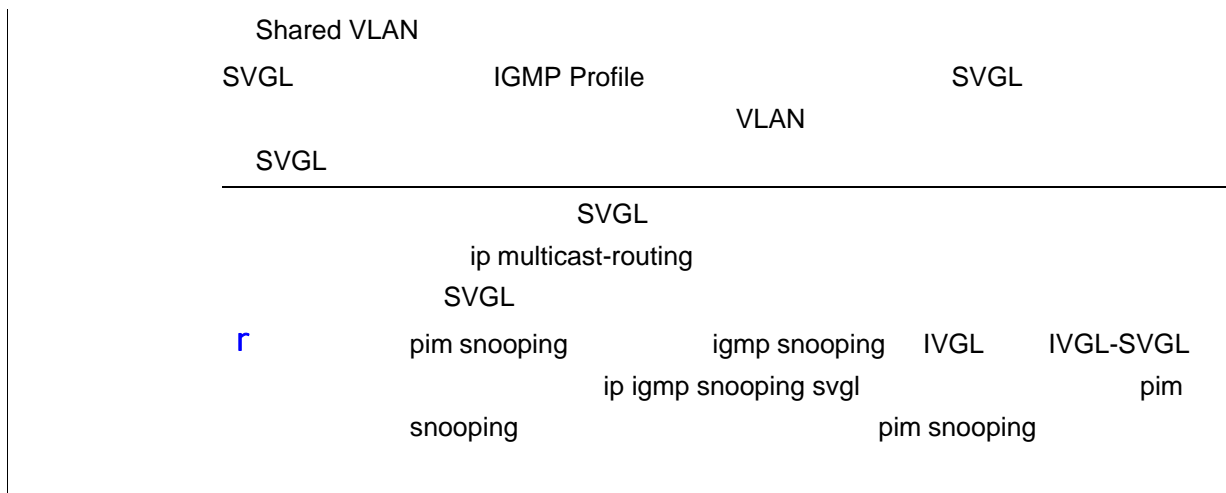
    
```

```

IGMP Profile          IVGL  SVGL          IVGL  SVGL
                      IVGL  SVGL
                      VLAN
                      VLAN
    
```

IVGL-SVGL

r



```

Ruijie(config)# ip igmp snooping svgl profile 1
Ruijie(config)# ip igmp snooping svgl profile 1
    
```

<b>ip igmp snooping svgl vlan</b>	Shared VLAN
<b>ip igmp snooping svgl profile</b>	SVGL profile

-	-

### 15.1.8 ip igmp snooping vlan

```

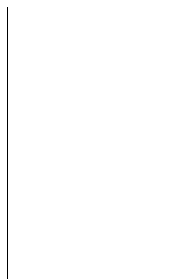
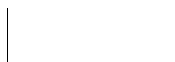
vlan          igmp snooping          ivgl          ip igmp
snooping vlan      no          igmp snooping

ip igmp snooping vlan vid
no ip igmp snooping vlan vid
    
```

vid	vlan id

```

disable
    
```



	vlan	IGMP Snooping
	vlan pim snooping	igmp snooping
r	no ip igmp snooping vlan	igmp snooping
	pim snooping VLAN	pim snooping

vlan 2 igmp snooping

```

                vlan 2  igmp snooping svgl          vlan
Ruijie(config)# ip igmp snooping svgl vlan 2
    
```

<b>ip igmp snooping svgl</b>	igmp snooping	svgl	
<b>ip igmp snooping ivgl-svgl</b>	igmp snooping		

-		-	

### 15.1.10 ip igmp snooping svgl profile

```

                profile          SVGL          ip igmp snooping svgl
profile          no
ip igmp snooping svgl profile profile-number
no ip igmp snooping svgl profile
    
```

		<b>EÄ</b>	
<i>profile-number</i>	profile	<1-65536>	

```

                svgl          profile
    
```

```

                SVGL          IVGL-SVGL
    
```

```

                igmp snooping svgl
    
```

-	-

### 15.1.11 ip igmp snooping dyn-mr-aging-time

**ip igmp snooping dyn-mr-aging-time time**

**no ip igmp snooping dyn-mr-aging-time**

<i>time</i>	, <1-3600>

300s

Hello

IGMP	PIM
------	-----

100s

Ruijie(config)# ip igmp snooping dyn-mr-aging-time 100


-	-

### 15.1.12 ip igmp snooping fast-leave enable

igmp snooping		ip igmp snooping fast-leave
enable	no	igmp snooping fast-leave

**ip igmp snooping fast-leave enable**

**no ip igmp snooping fast-leave enable**

	-	-

disable

IP IGMP

IP IGMP

igmp snooping fast-leave

Ruijie(config)# **ip igmp snooping fast-leave enable**

┌

┌

```

IGMP
                                0
                                IGMP Snooping

IGMP
                                0
                                IGMP Snooping

IGMPv3
    
```

┌

```

                                100s
Ruijie(config)# ip igmp snooping query-max-response-time 100
    
```

┌


┌

┌

-	-

### 15.1.14 ip igmp snooping limit-ipmc

```

no IP IP ip igmp snooping limit-ipmc vlan
    
```

**ip igmp snooping limit-ipmc vlan** *vid address gaddress server saddress*

**no ip igmp snooping limit-ipmc vlan** *vid address gaddress server saddress*

┌

<i>vid</i>	ip            vlan id
<i>gaddress</i>	
<i>saddress</i>	(            )

┌

┌

┌

IP

┌  
└

ip

Ruijie(config)# **ip igmp snooping limit-ipmc vlan 1 address 224.0.0.1 server 192.168.4.243**

┌  
└

<b>ip igmp snooping source-check default-server</b>	IP IP

┌

┌  
└

-	-

### 15.1.15 ip igmp snooping suppression enable

igmp snooping Report  
**suppression enable**          no          ip igmp snooping  
 igmp snooping suppression  
**ip igmp snooping suppression enable**  
**no ip igmp snooping suppression enable**

┌  
└

-	-

┌

disable

┌

┌  
└

IGMP  
 vlan                                  IGMP Report  
 IGMP Report                                  IGMPv1/v2 report  
 suppression                                  IGMPv3 report

┌  
└

**igmp snooping suppression**  
 Ruijie(config)# **ip igmp snooping suppression**

-	-

┌

-	-

### 15.1.16 ip igmp snooping mrouter learn pim-dvmrp

IGMP Query/Dvmrp/PIM Hello  
**ip igmp snooping mrouter learn** no

**ip igmp snooping mrouter learn pim-dvmrp**

**no ip igmp snooping mrouter learn pim-dvmrp**


┌

┌

```

no
                                no
                                vlan
                                vlan
                                vlan
                                igmp snooping

```

┌

Ruijie(config)# **ip igmp snooping mrouter learn pim-dvmrp**

--	--

	<b>ip igmp snooping vlan mrouter learn pim-dvmrp</b>	vlan
	-	-

### 15.1.17 ip igmp snooping vlan mrouter interface

**ip igmp snooping vlan mrouter interface** , no

**ip igmp snooping vlan** *vid* **mrouter interface** *interface-id*

**no ip igmp snooping vlan** *vid* **mrouter interface** *interface-id*

	<i>vid</i>	vlan id
	<i>interface-id</i>	id

└───┘

└───┘

IP

└───┘

```
Ruijie(config)# ip igmp snooping vlan 1 mrouter interface
fastEthernet 0/1
```

	<b>ip igmp snooping source-check port</b>	

└───┘

-	-

### 15.1.18 ip igmp snooping vlan mrouter learn pim-dvmrp

IGMP Query/Dvmrp/PIM Hello  
**ip igmp snooping vlan mrouter learn**                      no

**ip igmp snooping vlan *vid* mrouter learn pim-dvmrp**

**no ip igmp snooping vlan *vid* mrouter learn pim-dvmrp**

<i>vid</i>	vlan id

┌

┌

```

VLAN                               VLAN
                                no
                                igmp snooping
    
```

```

                                vlan 1
Ruijie(config)# ip igmp snooping vlan 1 mrouter learn pim-dvmrp
    
```

<b>ip igmp snooping mrouter learn pim-dvmrp</b>	

┌

-	-



**no ip igmp snooping filter *profile-number***

<i>profile-number</i>	profile	<1-65536>

└───┘

└───┘

```

IGMP Profile                                IGMP Report
IGMP Profile                                profile      filter
0/1      profile 1
Ruijie(config)# interface fastEthernet 0/1
Ruijie(config-if)# ip igmp snooping filter 1
    
```

<b>ip igmp profile</b>	profile

└───┘

-	-

**15.1.21 ip igmp snooping max-groups**

```

max-groups no ip igmp snooping
ip igmp snooping max-groups number
no ip igmp snooping max-groups
    
```

<i>number</i>	<0 – 1024>

└───┘

|

|

IGMP Report

|

```

0/1      100
Ruijie(config)# interface fastEthernet 0/1
Ruijie(config-if)# ip igmp snooping max-group 100
    
```

|

<b>ip igmp snooping filter</b>	

|

|

-	-

## 15.2

### 15.2.1 show ip igmp snooping

igmp snooping

**Show ip igmp snooping [gda-table | interfaces | mrouter/ statistics [vlan *vlan-id* ]**

|

	igmp snooping
<b>gda-table</b>	
<b>interfaces</b>	igmp snooping filtering
<b>mrouter</b>	
<b>statistics [vlan <i>vlan-id</i>]</b>	snooping
<b>vlan</b>	vlan          snooping

|

|

EXEC

|

|

|

-	-

|

|

-	-

**15.2.2 show ip igmp profile [ profile-number]**

|

	profile
<i>profile-number</i>	profile

|

|

EXEC

|

profile

|

IGMP Snooping Debug

no

- debug igmp-snp**
- debug igmp-snp event**
- debug igmp-snp packet**
- debug igmp-snp msf**
- debug igmp-snp warning**
- undebug igmp-snp**
- undebug igmp-snp event**
- undebug igmp-snp packet**
- undebug igmp-snp msf**
- undebug igmp-snp warning**

	IGMP Snooping
<b>event</b>	IGMP Snooping
<b>packet</b>	IGMP Snooping
<b>msf</b>	IGMP Snooping
<b>warning</b>	IGMP Snooping

EXEC

-	-

-	-

# 16 DHCPV6 Snooping

## 16.1

### 16.1.1 ipv6 dhcp snooping

```

dhcpv6 snooping no dhcpv6
snooping

```

**ipv6 dhcp snooping**

**no ipv6 dhcp snooping**

-	-

┌

┌

```

snooping

```

```

dhcpv6 snooping show ipv6 dhcp
dhcpv6 snooping

```

```

1
Ruijie(config)#

```

```

dhcpv6 snooping
ipv6 dhcp snooping

```

<b>show ipv6 dhcp snooping</b>	dhcpv6 snooping

┌

```

10.4

```

10.4	

### 16.1.2 ipv6 dhcp snooping binding-delay

no

**ipv6 dhcp snooping binding-delay *seconds*****no ipv6 dhcp snooping binding-delay**

<i>time</i>	

┌

┌

┌

IPv6

1 10

Ruijie(config)# **ipv6 dhcp snooping binding-delay 10**


┌

10.4	

### 16.1.3 ipv6 dhcp snooping database write-delay

dhcpv6 snooping

flash

no

**ipv6 dhcp snooping database write-delay *time*****no ipv6 dhcp snooping database write-delay**

<i>time</i>	flash

┌

|

|

dhcpv6 snooping flash  
IP

|

1 flash 100  
Ruijie(config)# ipv6 dhcp snooping database write-delay 100

|

<b>show ipv6 dhcp snooping</b>	dhcpv6 snooping

|

10.4	

### 16.1.4 ipv6 dhcp snooping database write-to-flash

|

dhcpv6 snooping flash  
**ipv6 dhcp snooping database write-to-flash**

|

-	

|

|

dhcpv6 snooping flash  
flash flash

|

1 dhcpv6 snooping flash  
Ruijie(config)# ipv6 dhcp snooping database write-to-flash

|

--	--

	10.4	

### 16.1.5 ipv6 dhcp snooping filter-dhcp-pkt

```

                                dhcpv6                                no
ipv6 dhcp snooping filter-dhcp-pkt
no ipv6 dhcp snooping filter-dhcp-pkt
    
```

--	--	--

└──┘

└──┘

└──┘

```

1          fastethernet 0/1          dhcpv6
Ruijie(config)# interface fastethernet 0/1
Ruijie(config-if)# ipv6 dhcp snooping filter-dhcp-pkt
    
```

	-	-

└──┘

	10.4	

### 16.1.6 ipv6 dhcp snooping ignore dest-not-found

no DHCPv6

**ipv6 dhcp snooping ignore dest-not-found**

**no ipv6 dhcp snooping ignore dest-not-found**

--	--

└──

└──

DHCPv6	MAC	MAC	DHCPv6	MAC
DHCPV6_SNOOPING-5-DEST_NOT_FOUND: Could not find destination port.				
Destination MAC [mac-address]			DHCPv6	
	MAC			VLAN

1  
Ruijie(config)# **ipv6 dhcp snooping ignore dest-not-found**

<b>show ipv6 dhcp snooping</b>	dhcpv6 snooping

└──

10.4	

### 16.1.7 ipv6 dhcp snooping link-detection

LINK DOWN no

**ipv6 dhcp snooping link-detection**

**no ipv6 dhcp snooping link-detection**

	LINK DOWN	
	LINK DOWN	
	1 LINK DOWN	
	Ruijie(config)# <b>ipv6 dhcp snooping link-detection</b>	
	<b>show ipv6 dhcp snooping</b>	dhcpv6 snooping
	<b>10.4</b>	

### 16.1.8 ipv6 dhcp snooping trust

```

                dhcpv6 snooping      trust      no
            untrust

ipv6 dhcp snooping trust
no ipv6 dhcp snooping trust

trust
    
```

```

1          fastethernet 0/1  trust
Ruijie(config)# interface fastethernet 0/1
Ruijie(config-if)# ipv6 dhcp snooping trust
    
```

<b>show ipv6 dhcp snooping</b>	dhcpv6 snooping

<b>10.4</b>	

### 16.1.9 Ipv6 dhcp snooping vlan

```

vlan          dhcpv6 snooping          no
vlan          dhcpv6 snooping
    
```

**ipv6 dhcp snooping** {*vlan-list* | {*vlan-min* [*vlan-max*]}}

**no ipv6 dhcp snooping** {*vlan-list* | {*vlan-min* [*vlan-max*]}}

<i>vlan-list</i>	vlan 1,3-5,7,9-11
<i>vlan-min</i>	vlan id
<i>vlan-max</i>	vlan id

```

dhcpv6 snooping  vlan
    
```

```

dhcpv6 snooping          vlan  dhcpv6 snooping
vlan          dhcpv6 snooping          vlan          dhcpv6 snooping
    
```

```

1  vlan 1          dhcpv6 snooping
Ruijie(config)# no ipv6 dhcp snooping vlan 1
    
```

--	--

	-	-
--	---	---

10.4

### 16.1.11 ipv6 verify source

no

**ipv6 verify source [port-security]**

**no ipv6 verify source**

<b>port-security</b>	MAC + IPV6 IPV6 IPV6
	MAC IPV6

┌

┌

┌

IPV6

DHCPV6

IPV6

┌  
 1           **fastethernet 0/1**   MAC+IPV6  
 Ruijie(config)# **interface fastethernet 0/1**  
 Ruijie(config-if)# **ipv6 verify source port-security**

┌

┌

┌

10.4

## 16.2

### 16.2.1 show ipv6 dhcp snooping

dhcpv6 snooping

**show ipv6 dhcp snooping**

-	-

└───

└───

└───

dhcpv6 snooping

1 dhcpv6 snooping

**Ruijie# show ipv6 dhcp snooping**

Switch DHCPv6 snooping status ENABLE

DHCPv6 snooping vlan: 1-4094

DHCPv6 snooping database write-delay time: 0 seconds

DHCPv6 ignore dest-not-found :DISABLE

DHCPv6 snooping link detection :DISABLE

Interface	Trusted	Filter DHCP
-----	-----	-----
FastEthernet0/10	yes	DISABLE

└───


└───

└───

10.4	

**16.2.2 show ipv6 dhcp snooping binding**

dhcpv6 snooping

**show ipv6 dhcp snooping binding** [ipv6-address] [mac-address] [vlan vlan\_id]  
 [interface interface\_name]



	VLAN
_name	

dhcpv6 snooping

show ipv6 dhcp snooping prefix

number of prefix: 1

Address	IPv6 Prefix	Lease(s)	VLAN	Interface
10.f801.0101	2001:2002::/64	42368	2	fa 0/1



dhcpv6 snooping

**show ipv6 source binding** [*ipv6-address*] [*mac-address*] [**vlan** *vlan\_id*]  
[**interface** *interface\_name*] [**dhcp-snooping** | **static**]

## 16.3.1 clear ipv6 dhcp snooping binding

dhcpv6 snooping

**clear ipv6 dhcp snooping binding** [*ipv6-address*] [*mac-address*] [**vlan** *vlan\_id*]  
[**interface** *interface\_name*]

<i>ipv6-address</i>	ipv6
<i>mac-address</i>	mac
<b>vlan</b> <i>vlan_id</i>	VLAN
<b>interface</b> <i>interface_name</i>	

1

.

∅

*f*

<i>ipv6-prefix</i>	ipv6
<i>mac-address</i>	mac
<b>vlan</b> <i>vlan_id</i>	VLAN
<b>interface</b> <i>interface_name</i>	

┌

┌

┌

dhcpv6 snooping

┌  
1 dhcpv6 snooping  
Ruijie# **clear ipv6 dhcp snooping prefix**

┌


┌

┌

<b>10.4</b>	

### 16.3.3 clear ipv6 dhcp snooping statistics

dhcpv6 snooping    dhcpv6

**clear ipv6 dhcp snooping statistics**

┌

-	-

┌

┌

┌

dhcpv6 snooping    dhcpv6



	<b>10.4</b>	

# 17 ND Snooping

## 17.1

### 17.1.1 ipv6 nd snooping

IPv6 ND snooping

no

10.4(2)	

### 17.1.2 ipv6 nd snooping vlan

VLAN IPv6 ND snooping no VLAN  
 IPv6 ND Snooping  
**ipv6 nd snooping vlan {vlan-rng | {vlan-min [vlan-max]}}**  
**no ipv6 nd snooping vlan {vlan-rng | {vlan-min [vlan-max]}}**

<i>vlan-rng</i>	vlan
<i>vlan-min</i>	vlan
<i>vlan-max</i>	vlan

vlan ipv6 nd snooping

1 VLAN 100 IPv6 ND Snooping  
 Ruijie# **configure terminal**  
 Enter configuration commands, one per line. End with CNTL/Z.  
 Ruijie(config)# **no ipv6 nd snooping vlan 100**

2 VLAN 4 5-7 15 IPv6 ND Snooping  
 Ruijie# **configure terminal**  
 Enter configuration commands, one per line. End with CNTL/Z.  
 Ruijie(config)# **no ipv6 nd snooping vlan 4,5-7,15**

<b>show ipv6 nd snooping</b>	ipv6 nd snooping

10.4(2)	

### 17.1.3 ipv6 nd snooping trust

trust

no

untrust

**ipv6 nd snooping trust**

**no ipv6 nd snooping trust**


untrust

FastEthernet 0/1 Trust

Ruijie# **configure terminal**

Enter configuration commands, one per line. End with CNTL/Z.

Ruijie(config)# **interface fastethernet 0/1**

Ruijie(config-if)# **ipv6 nd snooping trust**

---

**show ipv6 nd snooping**

ipv6 nd snooping

### 17.1.4 ipv6 nd snooping check address-resolution

ND

no

ND

**ipv6 nd snooping check address-resolution [key-node-only ]**

**no ipv6 nd snooping check address-resolution**

<b>key-node-only</b>	ND

### 17.1.5 ipv6 nd snooping detect gateway

no

**ipv6 nd snooping detect gateway ra**  
**no ipv6 nd snooping detect gateway ra**


VLAN

Ruijie#

<i>vlan-rng</i>	vlan
<i>vlan-min</i>	vlan
<i>vlan-max</i>	vlan

VALN

```
Ruijie# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Ruijie(config)# ipv6 nd snooping detect gateway vlan 8
```

<b>show ipv6 nd snooping</b>	nd snooping

10.4(2)	

### 17.1.7 ipv6 nd snooping key-node

ND

nD



ND

```
Ruijie# configure terminal
```

```
Enter configuration commands, one per line. End with CNTL/Z.
```

```
Ruijie(config)#no ipv6 nd snooping monitor stateless-user
```



```
Ruijie# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Ruijie(config)# ipv6 nd snooping stateless-user combine-security
```

<b>show ipv6 nd snooping</b>	ipv6 nd snooping

10.4(2)	

### 17.1.10 ipv6 nd snooping stateless-user address-bind

IPv6

no

```
ipv6 nd snooping stateless-user address-bind [strict] [ip-mac]
no ipv6 nd snooping stateless-user address-bind
```

<b>strict</b>	link-local link-local link-local
<b>ip-mac</b>	IP+MAC IP

1

```
Ruijie# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Ruijie(config)# ipv6 nd snooping stateless-user address-bind
    2                               IP+MAC
Ruijie# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Ruijie(config)#ipv6 nd snooping stateless-user address-bind strict
ip-mac
```

---

**show ipv6 nd snooping**

---

---

ipv6 nd snooping

---

Enter configuration commands, one per line. End with CNTL/Z.  
Ruijie(config)# **ipv6 nd snooping stateless-user station-move**



<b>show ipv6 nd snooping</b>	ipv6 nd snooping
10.4(2)	

### 17.1.13 ipv6 nd snooping stateless-user per-vlan prefix-limit

VLAN      IPv6

**ipv6 nd snooping stateless-user per-vlan prefix-limit num**  
**no ipv6 nd snooping stateless-user per-vlan prefix-limit**

<i>num</i>	VLAN      IPv6

2

VLAN      4      IPv6

Ruijie# **configure terminal**  
 Enter configuration commands, one per line. End with CNTL/Z.  
 Ruijie(config)#**ipv6 nd snooping stateless-user per-vlan prefix-limit 4**

<b>show ipv6 nd snooping</b>	ipv6 nd snooping
------------------------------	------------------

10.4(2)	
---------	--

**17.1.14 clear ipv6 nd snooping key-node**

**clear ipv6 nd snooping key-node [vlan *vid*]**

<i>vid</i>	VLAN

Ruijie# **clear ipv6 nd snooping key-node**


10.4(2)	

**17.1.15 clear ipv6 nd snooping stateless-user**

**clear ipv6 nd snooping stateless-user [vlan *vid*]**

<i>vid</i>	VLAN

```
Ruijie# clear ipv6 nd snooping stateless-user
```

	10.4(2)	

## 17.2

### 17.2.1 show ipv6 nd snooping

IPv6 nd snooping

**show ipv6 nd snooping [interface]**

	<b>interface</b>	

└─┘

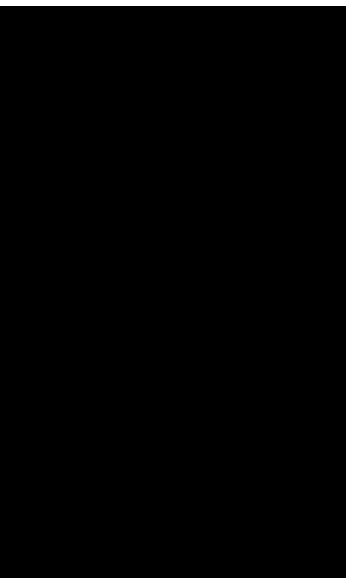
└─┘

└─┘

IPv6 nd snooping

Ruijie# **show ipv6 nd snooping**

—@ **2025/11/28 14:56:34**



## 17.2.2 show ipv6 nd snooping key-node

**show ipv6 nd snooping key-node**


|

|

|

|

Ruijie# **show ipv6 nd snooping key-node**

|

### 17.2.3 show ipv6 nd snooping stateless-user

ipv6

**show ipv6 nd snooping stateless-user**


ND Snooping

# 18 MSTP

## 18.1

### 18.1.1 bpdu src-mac-check

bpdu mac

no

bpdu mac

**bpdu src-mac-check *H.H.H***

**no bpdu src-mac-check**

<i>H.H.H</i>	mac	bpdu
<b>no</b>	bpdu	

┌

┌

┌

```
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# bpdu src-mac-check 00d0.f800.1e2f
```

-	-

┌



RSTP BPDUs BPDUs

**clear spanning-tree detected-protocols [interface *interface-id*]**

<i>interface-id</i>	

|

|

|

|

Ruijie# **clear spanning-tree detected-protocols**

<b>show spanning-tree interface</b>	STP

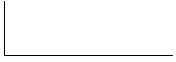
|

-	-

### 18.1.3 spanning-tree

MSTP MSTP MSTP

spanning-5(tg)1 spanning-02\_0 1 Tf0 Tc 6 Tw 16.0570 Td<0A1C>Tj/TT0 1 Tf1 0 Td( )TjETT1 1 Tf-0.0086 T



**forward-time hello-time max-age**

```
Ruijie(config)# interface gigabitethernet 1/1  
Ruijie(config-if)# spanning-tree autoedge disabled
```

<b>show spanning-tree interface</b>	STP

--	--



	-	-
--	---	---

|

|

|

|

Ruijie(config-if)#**spanning-tree compatible enable**

Q<sub>3</sub>

	-	-

┌

	-	-

### 18.1.9 spanning-tree guard none

guard                      no                      guard

**spanning-tree guard none**

**no spanning-tree guard none**

	-	-

┌

guard

┌

┌

┌

Ruijie(config-if)# **spanning-tree guard none**

	-	-

┌

	-	-

### 18.1.10 spanning-tree guard root

root guard

```

┌
└

```

```

┌
└

```

```

Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# spanning-tree link-type point-to-point

```

<b>show spanning-tree interface</b>	STP

```

┌
└

```

-	-

## 18.1.12 spanning-tree loopguard default

```

loop guard          no          loop guard          loop guard
                    bpdus

```

**spanning-tree loopguard default**

**no spanning-tree loopguard default**

-	-

```

┌
└

```

```

loop guard

```

```

┌
└

```

```

┌
└

```

```

Ruijie(config)# spanning-tree loopguard default

```



## 18.1.14 spanning-tree mode

STP                    no

**spanning-tree mode [stp | rstp | mstp]**

**no spanning-tree mode**

<b>stp</b>	Spanning tree protocol(IEEE 802.1d)
<b>rstp</b>	Rapid spanning tree protocol(IEEE 802.1w)
<b>mstp</b>	Multiple spanning tree protocol(IEEE 802.1s)

MSTP

.

.

Ruijie(config)# **spanning-tree mode stp**

<b>show spanning-tree</b>	

.



```
VLAN 3 Instance 1 MST
Ruijie(config-mst)# no instance 1 vlan 3
Instance 1
Ruijie(config-mst)# no instance 1
MST show
```



MSTP

Region

Instance 20

8192

Ruijie(config-if)# **spanning-tree mst 20 priority 8192**

**show spanning-tree mst instance interface interface-id**



	<b>show spanning-tree interface</b>	STP
	-	-

### 18.1.20 spanning-tree portfast

	Portfast	disabled
	Portfast	Portfast
	<b>spanning-tree portfast [disabled]</b>	
	<b>disabled</b>	Portfast
	-	
	<pre>Ruijie(config)# interface gigabitethernet 1/1 Ruijie(config-if)# spanning-tree portfast</pre>	
	<b>show spanning-tree interface</b>	STP

no spanning-tree portfast bpdulfilter default

-	-

BPDU filter

BPDU Filter BPDU show spanning-tree

```
Ruijie(config)# spanning-tree portfast bpdulfilter default
```

show spanning-tree interface	STP

-	-

18.1.22 spanning-tree portfast bpduguard default

BPDU guard no BPDU guard

spanning-tree portfast bpduguard default

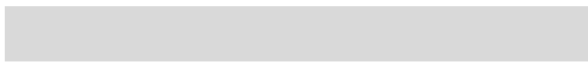
no spanning-tree portfast bpduguard default

-	-

BPDU Guard.

BPDU guard BPDU

```
Ruijie(config)# spanning-tree portfast bpduguard default
```



### 18.1.24 spanning-tree reset

	spanning-tree	no
	<b>spanning-tree reset</b>	
	-	-
	Ruijie(config)# <b>spanning-tree reset</b>	
	<b>show spanning-tree</b>	STP
	<b>show spanning-tree interface</b>	STP
	-	-

### 18.1.25 spanning-tree tc-guard

	tc-guard	no	tc-guard	tc-guard
	<b>spanning-tree tc-guard</b>			
	<b>no spanning-tree tc-guard</b>			
	-	-	-	-
	tc-guard			

|

|

|

Ruijie(config-if)# **spanning-tree tc-guard**

|

-	-

|

|

-	-

### 18.1.26 spanning-tree tc-protection

tc- protection

no

tc- protection

**spanning-tree tc- protection**

**no spanning-tree tc- protection**

|

-	-

|

tc- protection

|

|

|

Ruijie(config)# **spanning-tree tc- protection**

|

-	-

|

-	-

### 18.1.27 spanning-tree tc-protection tc-guard

tc-guard                                  no                                  tc-guard                                  tc-guard  
tc

**spanning-tree tc-protection tc-guard**

**no spanning-tree tc-protection tc-guard**

-	-

┌

tc-guard

┌

┌

┌

Ruijie(config)# **spanning-tree tc-protection tc-guard**

-	-

┌

-	-

### 18.1.28 spanning-tree tx-hold-count

STP                  TxHoldCount                                  BPDU                                  no

**spanning-tree tx-hold-count** *tx-hold-count*

**no spanning-tree tx-hold-count**

MSTP

---

<i>tx-hold-count</i>	TxHoldCount	1	10

3



Ruijie(config)# **spanning-tree tx-hold-count 5**

<b>show spanning-tree</b>	MSTP	

<b>tx-hold-count</b>	TxHoldCount
<b>pathcost method</b>	

└───

└───

└───

Ruijie# **show spanning-tree hello-time**

<b>spanningtree pathcost method</b>	
<b>spanning-tree forward-time</b>	BridgeForwardDelay
<b>spanning-tree hello-time</b>	BridgeHelloTime
<b>spanning-tree max-age</b>	BridgeMaxAge

<b>link-type</b>	linktype
------------------	----------

┌

┌

┌

Ruijie# **show spanning-tree interface gigabitethernet 1/5**

<b>spanning-tree bpdupfilter</b>	BPDU filter
<b>spanning-tree portfast</b>	portfast
<b>spanning-tree bpduguard</b>	BPDU guard
<b>spanning-tree link-type</b>	“ ”

┌

-	-
---	---

### 18.2.3 show spanning-tree mst

MST Instance

**show spanning-tree mst { configuration | instance-id [ interface interface-id ] }**

<b>configuration</b>	mst
<i>instance-id</i>	<i>Instance</i>
<i>interface-id</i>	

Instance

.

Ruijie# **show spanning-tree mst configuration**

<b>spanning-tree mst configuration</b>	MST region
<b>spanning-tree mst cost</b>	instance
<b>spanning-tree mst max-hops</b>	instance
<b>spanning-tree mst priority</b>	instance
<b>spanning-tree mst port-priority</b>	instance

-	-

# 19 SPAN

## 19.1

### 19.1.1 monitor session

SPAN . no

**monitor session** *session\_number* {**source interface** *interface-id* [**both** | **rx** | **tx**] | **destination interface** *interface-id* { **encapsulation** | **switch** } | **mac** {**source** *mac-addr* | **destination** *mac-addr* } [**both** | **rx** | **tx**] [**acl** *name*]

**no monitor session** *session\_number* [**source interface** *interface-id* [**both** | **rx** | **tx**] | **destination interface** *interface-id* { **encapsulation** | **switch** }] | **mac** {**source** *mac-addr* | **destination** *mac-addr* } [**both** | **rx** | **tx**] [**acl** *name*]

**no monitor session all**

<i>session_number</i>	SPAN
<b>source interface</b> <i>interface-id</i>	<i>interface-id</i> SVI
<b>destination interface</b> <i>interface-id</i>	<i>interface-id</i> SVI
<b>mac source</b> <i>mac-addr</i>	





## 20 RSPAN

### 20.1

#### 20.1.1 monitor session

RSPAN  
no

**monitor session** *session\_num* {**remote-destination** | **remote-source**}

**monitor session** *session-num* **destination remote vlan** *vlan-id* [**reflector-port**] **interface**  
*interface-name* [**switch**]

**monitor session** *session-num* **source interface** *interface-name* [**rx** | **tx** | **both**]

**monitor session** *session-num* **destination remote vlan** *vlan-id* **reflector-port** **interface**  
*interface-name* [**switch**]



```

1/2 //
Ruijie(config)# monitor session 2 destination remote vlan 7
interface gigabitEthernet 1/3 switch //
Ruijie(config)# monitor session 2 destination remote vlan 7
reflector-port interface gigabitEthernet 1/1 switch
2
Ruijie(config)# monitor session 2 remote-destination
Ruijie(config)# monitor session 2 destination remote vlan 7
interface gigabitEthernet 1/1 switch
    
```

<b>show monitor</b>	

reflector-port

-	-

### 20.1.2 remote-span

RSPAN VLAN

**[no] remote-span**

-	-

VLAN

end            Ctrl+C  
 exit

Ruijie(config)#

	<b>show vlan</b>	Vlan
	S5760	
	-	-

# 21 IP

## 21.1

### 21.1.1 ip address

IP

no

IP

**ip address** *ip-address network-mask* [ **secondary** ]

**no ip address** *ip-address network-mask* [ **secondary** ]



```

> C
> IP
> IP
> IP
> IP

```

```

IP 10.10.10.1 255.255.255.0
ip address 10.10.10.1 255.255.255.0

```

<b>show interface</b>	

```

IP secondary

```

-	-

### 21.1.2 ip unnumbered

```

IP no IP

```

**ip unnumbered** *interface-type interface-number*

**no ip unnumbered** *interface-type interface-number*

<i>interface-type</i>	
<i>interface-number</i>	

```


```

```


```

```

IP IP IP IP IP IP IP
IP IP IP

```

```
>  
>          SLIP HDLC PPP LAPB Frame-relay  
          X.25  
>    ping          IP  
    SNMP  
>
```

```
          FastEthernet 0/1  
    IP  
ip unnumbered fastEthernet 0/1
```

[Redacted]	
<b>show interface</b>	

[Redacted]	
-	-

## 21.2

### 21.2.1 arp

ARP





3

CPU



ARP IP

ARP

```

1          SVI 1          ARP
Ruijie(config)# interface vlan 1
Ruijie(config-if)# arp gratuitous-send interval 1

2          SVI 1          ARP
Ruijie(config)# interface vlan 1
Ruijie(config-if)# no arp gratuitous-send
    
```

-	-

-	-

### 21.2.4 arp retry interval

```

ARP          arp          IP          2
            no           1  ARP
arp retry interval seconds
no arp retry interval
    
```

<i>seconds</i>	<1-3600>,ARP 3600                      1

```
ARP          1
```

```
ARP          ARP          ARP
```

```
ARP          30s
```

arp retry interval 30

<b>Arp retry times number</b>	ARP

-	-

### 21.2.5 arp retry times

arp IP ARP  
no 5 ARP

**arp retry times number**

**no arp retry times**

<i>number</i>	1 ARP <1-100> 1 ARP

ARP ARP 5

ARP ARP

1 ARP

arp retry times 1

2 ARP 1

arp retry times 2

--	--

IP

┌

-	-

## 21.2.6 arp timeout

ARP ARP no

**arp timeout** *seconds*

**no arp timeout**

<i>seconds</i>	0-2147483

┌ 3600

┌

ARP IP MAC  
ARP ARP  
ARP

FastEthernet 0/1 ARP  
120  
interface fastEthernet 0/1  
arp timeout 120

--	--

che 2\_0 1 Tf0 Tc 0 Tw 7.593 02 Td52Td( )Tj0EB>D921CD0 1 Tf2 0 TdTc 5.245 0 Td52ARP

### 21.2.7 arp trusted aging

ARP

no

arp trusted aging

no arp trusted aging

	-	-

GSN ARP

ARP ARP  
arp timeout

	service trustedarp	ARP

	-	-

### 21.2.8 arp trusted *number*

ARP

no

arp trusted *number*

no arp trusted

--	--	--

L

L

L

ARP ARP ARP  
ARP

L

1000 ARP

**arp trusted 1000**

L

<b>service trustedarp</b>	ARP

L

L

-	-

		500
	arp unresolved 500	
	-	-
	-	-

### 21.2.10 ip proxy-arp

	ARP	ip proxy-arp	no
ARP			
ip proxy-arp			
no ip proxy-arp			
	-	-	

IP

---

	-	-

## 21.3

### 21.3.1 ip broadcast-addresss

**ip broadcast-addresss** no

**ip broadcast-addresss** *ip-address*

**no ip broadcast-addresss** *ip-address*

<i>ip-address</i>	IP

IP 255.255.255.255

IP R

1

**no ip directed-broadcast**

<i>access-list-number</i>	1-199 1300 - 2699 IP

┌

┌

┌

```

IP                IP                IP
172.16.16.255

                IP
                1
    IP
    
```

**no ip directed-broadcast** RGOS

┌

```

FastEthernet 0/1
interface fastEthernet 0/1
ip directed-broadcast
    
```

┌

-	-

┌

┌

-	-

**21.4 IP**



IP

|

|

-	-

## 21.4.2 clear ip route

route IP IP clear ip

clear ip route { \* | network [ netmask ] }

|

*	
network	
netmask	

|

|

|

|

192.168.12.0  
clear ip route 192.168.12.0

|

show ip route	IP IPf 66..411.5BE.02 78.36 451.7003 T

## ARP

**show arp** [[vrf *vrf-name*] [trusted] ip [mask] | static | complete | incomplete | mac-address ]

<b>vrf</b> <i>vrf_name</i>	VRF		VRF	ARP
<b>trusted</b>	ARP	ARP		VRF
<i>ip</i>	IP		IP	ARP
	<b>trusted</b>			ARP
		ARP		
<i>mask</i>	IP	ARP	;	trusted
		ARP		
	ARP			
<b>static</b>		arp		
<i>mac-address</i>		mac	ARP	
<b>complete</b>			arp	
<b>incomplete</b>			arp	
<b>oob</b>			(interface of mgmt)	ARP

1 show arp

Ruijie# show arp

Total Numbers of Arp: 7

Protocol	Address	Age(min)	Hardware	Type	Interface
Internet	192.168.195.68	0	0013.20a5.7a5f	arpa	VLAN 1
Internet	192.168.195.67	0	001a.a0b5.378d	arpa	VLAN 1
Internet	192.168.195.65	0	0018.8b7b.713e	arpa	VLAN 1
Internet	192.168.195.64	0	0018.8b7b.9106	arpa	VLAN 1
Internet	192.168.195.63	0	001a.a0b5.3990	arpa	VLAN 1
Internet	192.168.195.62	0	001a.a0b5.0b25	arpa	VLAN 1
Internet	192.168.195.5	--	00d0.f822.33b1	arpa	VLAN 1

## ARP

Protocol	Internet
Address	IP
Age (min)	ARP “_”
Hardware	IP
Type	ARPA
Interface	IP

2 show arp 192.168.195.68

Ruijie# **show arp 192.168.195.68**

```
Protocol Address Age(min) Hardware Type Interface
Internet 192.168.195.68 1 0013.20a5.7a5f arpa VLAN 1
```

3 show arp 192.168.195.0 255.255.255.0

Ruijie# **show arp 192.168.195.0 255.255.255.0**

```
Protocol Address Age(min) Hardware Type Interface
Internet 192.168.195.64 0 0018.8b7b.9106 arpa VLAN 1
Internet 192.168.195.2 1 00d0.f8ff.f00e arpa VLAN 1
Internet 192.168.195.5 -- 00d0.f822.33b1 arpa VLAN 1
Internet 192.168.195.1 0 00d0.f8a6.5af7 arpa VLAN 1
Internet 192.168.195.51 1 0018.8b82.8691 arpa VLAN 1
```

4 show arp 001a.a0b5.378d

Ruijie# **show arp 001a.a0b5.378d**

```
Protocol Address Age(min) Hardware Type Interface
Internet 192.168.195.67 4 001a.a0b5.378d arpa VLAN 1
```

-	-

-	-

## 21.4.4 show arp counter

ARP

arp

**show arp counter**

	-	-

|

|

|

**show arp counter**

Ruijie# **show arp counter**

The Arp Entry counter:0

The Unresolve Arp Entry:0

	-	-

|

<b>complete</b>	arp
<b>incomplete</b>	arp

ARP

ARP

**show arp detail**Ruijie# **show arp detail**

IP Address	MAC Address	Type	Age(min)	Interface	Port
20.1.1.1	000f.e200.0001	Static	-- --	--	
20.1.1.1	000f.e200.0001	Static	-- VI3	--	
20.1.1.1	000f.e200.0001	Static	-- VI3	Gi2/0/1	
193.1.1.70	00e0.fe50.6503	Dynamic	1 VI3	Gi2/0/1	
192.168.0.1	0012.a990.2241	Dynamic	10 Gi2/0/3	Gi2/0/3	
192.168.0.1	0012.a990.2241	Dynamic	20 Ag1	Ag1	
192.168.0.1	0012.a990.2241	Dynamic	30 VI2	Ag2	
192.168.0.39	0012.a990.2241	Local	-- VI3	--	
192.168.0.39	0012.a990.2241	Local	-- Gi2/0/3	--	
192.168.0.1	0012.a990.2241	Local	-- VI3	--	
192.168.0.1	0012.a990.2241	Local	-- Gi2/3/2	--	

ARP



Port	ARP
------	-----

-	-

10.4	10.4

### 21.4.6 show arp timeout

ARP

show arp timeout

-	-

show arp timeout

Ruijie# show arp timeout

Interface arp timeout(sec)

-----

VLAN 1 3600

-	-

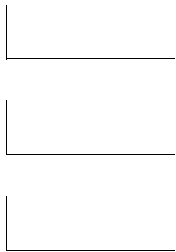
-	-

### 21.4.7 show ip arp

ARP

show ip arp

-	-



show ip arp

Ruijie# show ip arp

```

Protocol Address      Age(min)Hardware      Type
Interface
Internet 192.168.7.233  23  0007.e9d9.0488  ARPA FastEthernet 0/0
Internet 192.168.7.112  10  0050.eb08.6617  ARPA FastEthernet 0/0
Internet 192.168.7.79   12  00d0.f808.3d5c  ARPA FastEthernet 0/0
Internet 192.168.7.1    50  00d0.f84e.1c7f  ARPA FastEthernet 0/0
Internet 192.168.7.215  36  00d0.f80d.1090  ARPA FastEthernet 0/0
Internet 192.168.7.127  0   0060.97bd.ebee  ARPA FastEthernet 0/0
Internet 192.168.7.195  57  0060.97bd.ef2d  ARPA FastEthernet 0/0
Internet 192.168.7.183  --  00d0.f8fb.108b  ARPA FastEthernet 0/0
    
```

ARP

Protocol	Internet
Address	IP
Age (min)	ARP “_”
Hardware	IP

IP

Type	ARPA
Interface	IP

-	-

-	-

### 21.4.8 show ip interface

IP

**show ip interface** [ *interface-type interface-number* ]

<i>Interface-type</i>	
<i>Interface-number</i>	

RGOS

IP address is:  
192.168.5.133/24 (primary)  
IP address negotiate is: OFF  
Forward direct-boardcast is: ON  
ICMP mask reply is: ON  
Send ICMP redirect is: ON  
Send ICMP unreachableled is: ON  
DHCP relay is: OFF  
Fast switch is: ON  
Route horizontal-split is: ON  
Help address is: 0.0.0.0  
Proxy ARP is: ON  
Outgoing access list is not set.  
Inbound access list is not set.

	-	-



	-	-

### 21.4.9 show ip redirects

show ip redirects



## 22.1.2 ip mtu

IP MTU ip mtu no

ip mtu bytes

no ip mtu

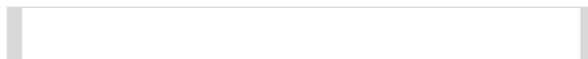
bytes	IP		68~1500

mtu

IP	IP MTU	RGOS	
		IP MTU	
	mtu		IP MTU
MTU		IP MTU	MTU

```

FastEthernet 0/1 IP MTU 512
interface fastEthernet 0/1
ip mtu 512
    
```



	-	-

┌

┌

┌

ICMP

RGOS ICMP

┌

FastEthernet 0/1 ICMP

```
interface fastEthernet 0/1
no ip redirects
```

	-	-

┌

	-	-

### 22.1.4 ip source-route

RGOS IP ip source-route  
no

**ip source-route**

**no ip source-route**

	-	-

┌



RGOS

IP

IP

IP

RFC 791

ICMP

RGOS



# 23 DHCP

## 23.1 DHCP

### 23.1.1 bootfile

	DHCP	DHCP	bootfile
	no		
	bootfile <i>file-name</i>		
	no bootfile		
	DHCP		
	DHCP	DHCP	DHCP
		next-server	TFTP
		router.conf	
	bootfile router.conf		
	ip dhcp pool	DHCP	DHCP
	next-server	DHCP	IP
	-	-	

## 23.1.2 client-identifier

DHCP  
**client-identifier**                      **no**                      DHCP

**client-identifier** *unique-identifier*

**no client-identifier**

<i>unique-identifier</i>	DHCP 0100.d0f8.2233.b467.6967.6162.6974.4574.6865.726e.6574.302f.31

DHCP

DHCP	DHCP	IP	MAC
00d0.f822.33b4	GigabitEthernet 0/1		
0100.d0f8.2233.b467.6967.6162.6974.4574.6865.726e.6574.302f.31			01
67.6967.6162.6974.4574.6865.726e.6574.302f.31		GigabitEthernet0/1	
		RFC1700	Address Resolution Protocol
Parameters			
DHCP			

MAC                      00d0.f822.33b4                      DHCP

*client-identifier*  
0100.d0f8.2233.b467.6967.6162.6974.4574.6865.726e.6574.302f.31

<b>hardware-address</b>	DHCP
<b>host</b>	IP DHCP
<b>ip dhcp pool</b>	DHCP DHCP

┌

┌

-	-

### 23.1.3 client-name

DHCP  
DHCP

DHCP

**client-name**

no

**client-name** *client-name*

**no client-name**

┌

<i>client-name</i>	DHCP DHCP
	ASCII river river.i-net.com.cn

┌

┌

DHCP

┌

DHCP

DHCP

┌

client-name river river

┌

<b>host</b>	IP DHCP
<b>ip dhcp pool</b>	DHCP DHCP

┌

┌

-	-

### 23.1.4 default-router

DHCP

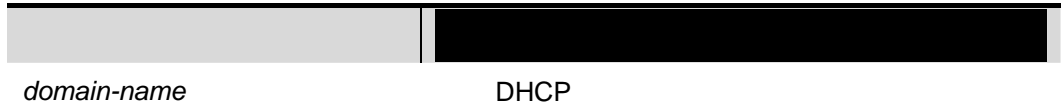
DHCP

**default-router**

**no**

**default-router**





	DHCP
<i>type</i>	> ethernet > ieee802  > 1 10M ethernet > 6 IEEE 802

---

ethernet

DHCP

DHCP

.



┌

DHCP IP

┌

┌

```

RGOS          DHCP          IP          DHCP
      1 DHCP      1          2 DHCP      3
3 DHCP      6 DNS          4 DHCP      15          DHCP
44 WINS
RGOS          PPP FR HDLC          dhcp
    
```

┌

```

          FastEthernet 0          IP
interface fastEthernet 0
ip address dhcp
    
```

┌

<b>dns-server</b>	DHCP DNS
<b>ip dhcp pool</b>	DHCP DHCP

┌

┌

-	-

23.1.10 ip add1(r )T/C2\_0 1 Tf0 Tc 0 Tr 10.5 0 0 1.02 625.9 361.520<3F55 Td<116

└──

DHCP

IP

└──

└──

IP

DHCP

DHCP

IP

IP

IP

DHCP

DHCP

└──

DHCP

192.168.12.100~150

IP

ip dhcp excluded-address 192.168.12.100 192.168.12.150



```

DHCP          DHCP          IP          ping
              DHCP          10          DHCP          Ping

```

```

              ping          3
ip dhcp ping packets 3

```

<b>clear ip dhcp conflict</b>	DHCP
<b>ip dhcp ping timeout</b>	DHCP ping ping
<b>show ip dhcp conflict</b>	DHCP

```


```

-	-

### 23.1.12 ip dhcp ping timeout

```

DHCP          ping
ip dhcp ping timeout          no
ip dhcp ping timeout milli-seconds
no ip dhcp ping timeout

```

<i>milli-seconds</i>	DHCP ping 100 10000

```

500

```

```


```

```

ping

```



ping

600ms

ip dhcp ping timeout 600



<b>host</b>	IP DHCP
<b>ip dhcp excluded-address</b>	DHCP IP
<b>network</b> DHCP	DHCP

┌

-	-

### 23.1.14 lease

DHCP  
**no**

DHCP

**lease**

**lease** { *days* [ *hours* ] [ *minutes* ] | **infinite** }

**no lease**

<i>days</i>	
<i>hours</i>	
<i>minutes</i>	
<b>infinite</b>	

┌

DHCP

┌

DHCP

DHCP

┌

lease 0 1 DHCP 1



DHCP 1

lease 0 0 1



	<b>ip dhcp pool</b>	DHCP DHCP
	-	-

### 23.1.16 netbios-node-type

DHCP                      NetBIOS                      DHCP

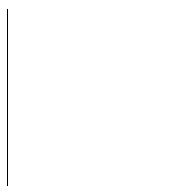
**netbios-node-type**                      **no**                      NetBIOS

**netbios-node-type** *type*

**no netbios-node-type**

		NetBIOS
		0~FF
	<i>type</i>	> b-node
		> p-node
		> m-node
		> 8 h-node
		> b-node
		> p-node
		> m-node
		> h-node

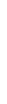
		NetBIOS	
		DHCP	
	DHCP	NetBIOS	1 Broadcast
	NetBIOS	2 Peer-to-peer	WINS
	NetBIOS	3 Mixed	
	WINS	4 Hybrid	WINS
	NetBIOS		NetBIOS



Hybrid

WINS

WINS  
NetBIOS



DHCP

NetBIOS

netbios-node-type h-node

```

show ip dhcp binding
show ip dhcp conflict
DHCP 192.168.12.0 255.255.255.240
network 192.168.12.0 255.255.255.240

```

<b>ip dhcp excluded-address</b>	DHCP IP
<b>ip dhcp pool</b>	DHCP DHCP
-	-

### 23.1.18 next-server

```

DHCP
next-server no
DHCP
next-server ip-address [ ip-address2...ip-address8 ]
no next-server

```

<i>ip-address</i>	IP	TFTP
<i>ip-address2...ip-address8</i>	8	
DHCP		
	DHCP	

DHCP  
next-server 192.168.12.4

192.168.12.4

<b>bootfile</b>	DHCP
<b>ip dhcp pool</b>	DHCP DHCP
<b>ip help-address</b>	Helper
<b>option</b>	RGOS DHCP

```

DHCP option                                RFC 2131
1 19                                         DHCP
IP 0 IP 1 IP                                DHCP
IP
option 19 hex 1
2 33                                         DHCP
DHCP
1 172.16.12.0 192.168.12.12
2 172.16.16.0 192.168.12.16
option 33 ip 172.16.12.0 192.168.12.12 172.16.16.0 192.168.12.16
```

<b>ip dhcp pool</b>	DHCP DHCP





DHCP

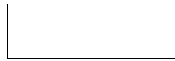


DHCP

service dhcp



<b>show ip dhcp server statistics</b>	DHCP



-	-

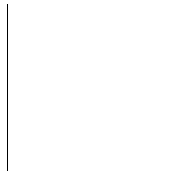
## 23.2

### 23.2.1 clear ip dhcp binding

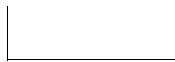
DHCP

**clear ip dhcp binding**

**clear ip dhcp binding { \* | ip-address }**



*	DHCP
<i>ip-address</i>	IP



DHCP

DHCP

**no ip dhcp pool**



IP 192.168.12.100 DHCP  
clear ip dhcp binding 192.168.12.100



--	--

	<b>show ip dhcp binding</b>	DHCP
	-	-

### 23.2.2 clear ip dhcp conflict

DHCP

**clear ip dhcp conflict**

**clear ip dhcp conflict { \* | ip-address }**

*		DCHP
<i>ip-address</i>		IP

DHCP ARP **clear ip dhcp conflict** ping DHCP

clear ip dhcp conflict \*

<b>ip dhcp ping packets</b>		DHCP ping
<b>show ip dhcp conflict</b>		DHCP

	-	-

### 23.2.3 clear ip dhcp server statistics

DHCP

clear ip dhcp server statistics

clear ip dhcp server statistics

	-	-



DHCP

DHCP

|

|

dhcp client

|

dhcp

debug ip dhcp client

|

[Redacted]	
-	-

|

|

[Redacted]	
-	-

### 23.2.5 debug ip dhcp server

DHCP Server

|

|

-	-

### 23.2.6 show dhcp lease

DHCP EXEC show dhcp lease

show dhcp lease

|

-	-

|

|

|

IP

IP

IP

|

**show dhcp lease**

Ruijie# **show dhcp lease**

Temp IP addr: 192.168.5.71 for peer on Interface: FastEthernet0/0

Temp sub net mask: 255.255.255.0

DHCP Lease server: 192.168.5.70, state: 3 Bound

DHCP transaction id: 168F

Lease: 600 secs, Renewal: 300 secs, Rebind: 525 secs

Temp default-gateway addr: 192.168.5.1

Next timer fires after: 00:04:29

Retry count: 0 Client-ID: redgaint-00d0.f8fb.5740-Fa0/0

|

-	-

|

|

--	--

	-	-
--	---	---

### 23.2.7 show ip dhcp binding

DHCP EXEC show ip dhcp binding

show ip dhcp binding [ ip-address ]

<i>ip-address</i>	IP

--

--

IP	IP	IP
----	----	----

#### show ip dhcp binding

Ruijie# show ip dhcp binding

```

IP address      Client-Id/      Lease expiration  Type
                Hardware address
192.168.1.2    00d0.f866.4777  IDLE              Manual
    
```

IP address	DHCP      IP
Client-Id/Hardware address	DHCP      client identifier
Lease expiration	Infinite      IDLE
Type	DHCP      Automatic      Manual

<b>clear ip dhcp binding</b>	DHCP

--



### 23.2.9 show ip dhcp server statistics

DHCP

EXEC

show ip dhcp server statistics

show ip dhcp server statistics

	-	-

┌

┌

┌

DHCP

Manual bindings	
Expired bindings	
Malformed messages	DHCP
Message Received or Sent	DHCP

<b>clear ip dhcp server statistics</b>	DHCP

--

-	-

# 24 DHCP Relay

## 24.1

### 24.1.1 ip dhcp relay check server-id

```
DHCP Relay    check server-id
DHCP Relay    check server-id
```

no

[no] ip dhcp relay check server-id

-	-

└───

└───

```

DHCP Relay    DHCP
DHCP          option server-id
              DHCP    DHCP
    
```

```

DHCP relay    check server-id
    
```

```
Ruijie# configure terminal
```

```
Ruijie(config)# ip dhcp relay check server-id
```

--	--

DHCP Relay option dot1x

no

**[no] ip dhcp relay information option dot1x**

	-	-

|

|

|

DHCP

802.1x

|  
|

|  
|

DHCP

1 DHCP relay

Ruijie# **configure terminal**

Ruijie(config)# **interface fastEthernet 0/1** config)# config)#

```

vrf
1          192.168.1.1
2          vrf    dep1      192.168.2.1
Ruijie# configure terminal
Ruijie(config)# ip helper-address 192.168.1.1
Ruijie(config)# ip helper-address vrf dep1 192.168.2.1
    
```

<b>service dhcp</b>	DHCP

-	-

### 24.1.5 service dhcp

DHCP no

**[no] service dhcp**

-	-

```

DHCP          DHCP          DHCP          DHCP
  DHCP        DHCP
    
```

```

DHCP
Ruijie# configure terminal
Ruijie(config)# service dhcp
    
```

	<b>ip helper-address [vrf] A.B.C.D</b>	DHCP

	-	-

# 25 DNS

## 25.1

### 25.1.1 ip domain-lookup

	DNS	no	DNS
	<b>ip domain-lookup</b>		
	<b>no ip domain-lookup</b>		
	-		-
	DNS		
	DNS		DNS
	DNS		
	Ruijie(config)# <b>ip domain-lookup</b>		
	<b>show hosts</b>		DNS
	-		-

### 25.1.2 ip name-server

no IP/IPv6

**ip name-server** {*ip-address* | *ipv6-address*}

**no ip name-server** [*ip-address* | *ipv6-address*]

<i>ip-address</i>	IP
<i>ipv6-address</i>	IPV6

└──

└──

DNS Server	IP/IPv6	DNS Server	DNS Server
Server		Server	DNS
6	DNS Server	ip-address	ipv6-address
	DNS		

Ruijie(config)# **ip name-server** 192.168.5.134  
 Ruijie(config)# **ip name-server**  
 2001:0DB8::250:8bff:fee8:f800 2001:0DB8:0:f004::1

<b>show hosts</b>	DNS

└──

-	-

<i>ip-address</i>	IP
-------------------	----

┌

┌

┌

**no ip host host-name ip-address**

┌

Ruijie(config)# **ip host switch 192.168.5.243**

┌

<b>show hosts</b>	DNS
-------------------	-----

┌

┌

-	-
---	---

### 25.1.4 ipv6 host

IPV6

no

**ipv6 host host-name ipv6-address**

**no ipv6 host host-name ipv6-address**

┌

<i>host-name</i>	
<i>ipv6-address</i>	IPV6

┌

┌

┌

**no ipv6 host host-name ipv6-address**

┌

Ruijie(config)# **ipv6 host ruijie 2001:0DB8:700:20:1::12**



## 25.2.2 show hosts

DNS

**show hosts** [*hostname*]

-	-

└───┘

└───┘

└───┘

DNS

```
Ruijie# show hosts
```

```
Name servers are:
```

```
static
```

```
host          type          address
```

```
switch        static        192.168.5.243
```

```
www.ruijie.com dynamic      192.168.5.123
```

<b>ip host</b>	IP
<b>ipv6 host</b>	IPV6
<b>ip name-server</b>	DNS

└───┘

-	-

## 26 SNTP

### 26.1

#### 26.1.1 sntp enable

SNTP

no

—Disable

[no] sntp enable





|

|

**show sntp**          SNTP

|

Ruijie(config)# **sntp server** 192.168.4.12

|

<b>show sntp</b>	SNTP
<b>sntp enable</b>	SNTP

|

RGOS10.0

|

-	-

## 26.2

> .show sntp

### 26.2.1 show sntp

|

SNTP

-	-

|

|

|

**show sntp**          SNTP

|

```
Ruijie# show sntp
SNTP state      : Enable
SNTP server     : 192.168.4.12
```

SNTP

---

SNTP sync interval : 60  
Time zone : +8

<b>sntp enable</b>	SNTP
<b>show sntp</b>	SNTP

RGOS10.0

-	-

# 27 NTP

## 27.1 NTP

### 27.1.1 no ntp

ntp	ntp
<b>no ntp</b>	
	NTP
	NTP NTP NTP
	no ntp NTP
	ntp server NTP
	-

### 27.1.2 ntp access-group

NTP no

**ntp access-group { peer | serve | serve-only | query-only } access-list-number | access-list-name**

**no ntp access-group { peer | serve | serve-only | query-only } access-list-number | access-list-name**

<b>peer</b>	NTP
<b>serve</b>	NTP
<b>serve-only</b>	NTP
<b>query-only</b>	NTP
<i>access-list-number</i>	IP 1 99 1300 1999
<i>access-list-name</i>	IP

NTP

NTP  
NTP  
NTP

peer serve serve-only query-only

r

1  
2

Ruijie(config)# **ntp access-group peer 1**

Ruijie(config)# **ntp access-group serve-only 2**

<b>ip access-list</b>	IP

	-	-

### 27.1.3 ntp authenticate

NTP          NTP

**ntp authenticate**

**no ntp authenticate**

	-	-

NTP

**ntp authentication-key   ntp trusted-key**

NTP

NTP

**ntp authentication-key** *key-id* **md5** *key-string* [*enc-type*]

**no ntp authentication-key** *key-id* **md5** *key-string* [*enc-type*]

<i>key-id</i>	ID
<i>key-string</i>	
<i>enc-type</i>	0

NTP

-	-
---	---

NTP

NTP	NTP
r	IP

no ntp

NTP

-	-
---	---

-	-
---	---

### 27.1.6 ntp master

no NTP  
NTP

**ntp master** [*stratum*]

**no ntp master**

<i>stratum</i>	8	1	15
----------------	---	---	----

NTP



┌

┌

20

prefer

NTP

IP

NTP

┌

NTP server

IPv4 Ruijie(config)# **ntp server** 192.168.210.222

IPv6 Ruijie(config)# **ntp server** 10::2

┌

<b>no ntp</b>	NTP

┌

┌

-	-

### 27.1.8 ntp synchronize

NTP

**ntp synchronize**

**no ntp synchronize**

┌

-	-

┌

┌

NTP

8

┌

┌

NTP

Ntp synchronize

┌

ntp server	NTP

┌

┌

-	-

### 27.1.9 ntp trusted-key

ID

**ntp trusted-key** *key-id*

**no ntp trusted-key** *key-id*

┌

<i>key-id</i>	ID

┌

┌

┌

NTP

ID

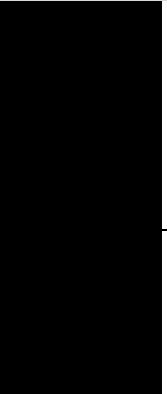
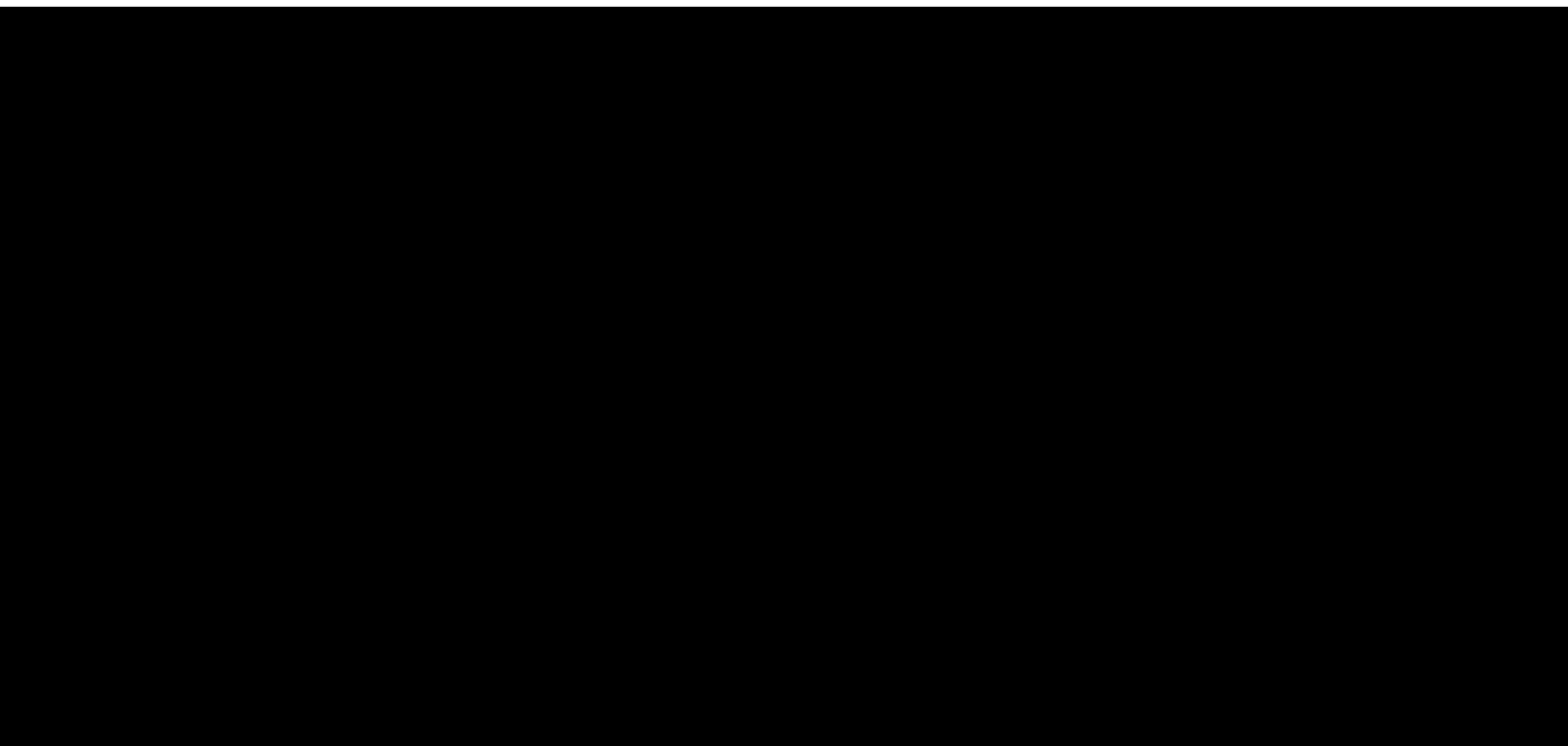
┌

```
ntp authentication-key 6 md5 woooooop
ntp trusted-key 6
ntp server 192.168.210.222 key 6
```

┌

--	--





NTP

---

	-	-

|

|

|

NTP

NTP

|

NTP

show ntp status

	-	-

|

	-	-

# 28 FTP Server

## 28.1

### 28.1.1 debug ftpserver

FTP no

**debug ftpserver**

**no debug ftpserver**

	-	-

|

|

|

**debug ftpserver** FTP

1

Ruijie# **debug ftpserver**

FTPSRV\_DEBUG:(RECV) SYST

FTPSRV\_DEBUG:(REPLY) 215 RGOS Type: L8

FTPSRV\_DEBUG:(RECV) PORT 192,167,201,82,7,120

FTPSRV\_DEBUG:(REPLY) 200 PORT Command okay.

2

Ruijie# **no debug ftpserver**

	-	-

|

|

--	--	--

	-	-
--	---	---

## 28.1.2 ftp-server enable

FTP                          no                          FTP

**ftp-server enable**

**no ftp-server enable**

	-	-

└──

└──

FTP

FTP

**r**

**ftp-server topdir**

FTP

**ftp-server password** [*type*] *password*

**no ftp-server password**

<i>type</i>	0 7 0
<i>password</i>	7

┌

┌

FTP

	1	25	4
	52		
r	FTP		

```

1 pass
Ruijie(config)# ftp-server password pass

Ruijie(config)# ftp-server password 0 pass
2 8001
Ruijie(config)# ftp-server password 7 8001
3
Ruijie(config)# no ftp-server password
    
```

-	-

┌

-	-

## 28.1.4 ftp-server topdir

FTP

no

FTP

**ftp-server topdir** *directory*

**no ftp-server topdir**

	<i>directory</i>	FTP

└──

└──

FTP







FTP

¥ K€

## 29 UDP-Helper

### 29.1

#### 29.1.1 ip forward-protocol

UDP

no

UDP

**ip forward-protocol udp** [*port* | **tftp** | **domain** | **time** | **netbios-ns** | **netbios-dgm** | **tacacs**]

**no ip forward-protocol udp** [*port* | **tftp** | **domain** | **time** | **netbios-ns** | **netbios-dgm** | **tacacs**]

Enter text in the box to search for a command in the Cisco IOS command reference.

```
Ruijie(config)# ip forward-protocol udp 134
```

<b>udp-helper enable</b>	UDP
<b>ip forward-protocol</b>	UDP

	RGOS10.1	
	-	-

### 29.1.3 udp-helper enable

<b>udp-helper enable</b>	UDP	<b>no udp-helper enable</b>
UDP		
UDP		
<b>udp-helper enable</b>		
<b>no udp-helper enable</b>		

	-	-

	UDP
--	-----

--	--

	UDP-Helper	69,53,37,137,138,49	UDP
--	------------	---------------------	-----

	UDP
	Ruijie(config)# <b>udp-helper enable</b>

	<b>ip forward-protocol</b>	UDP

	RGOS10.1	
--	----------	--

	-	-

SNMP

SNMP

no snmp

123456:

over chassis-id 123456

SNMP

<i>aclnumber</i>	1-99 MIB ipv4 NMS
<i>aclname</i>	MIB ipv4 NMS
<i>ipv6_aclname</i>	ipv6 MIB ipv6 NMS
<i>ipaddr</i>	NMS MIB NMS



**snmp-server host**

SNMP

Ruijie(config)# **snmp-server enable traps snmp**

Ruijie(config)# **snmp-server host 192.168.12.219 public snmp**

<i>ipv6_aclname</i>	ipv6 MIB    ipv6 NMS
Ruijie(config)# <b>snmp-server group mib2user v3 priv read mib2</b>	
<b>show snmp group</b>	SNMP
-	-

### 30.1.7 snmp-server host

no                    SNMP            NMS                    **snmp-server host**  
                                SNMP

**snmp-server host** {*host-addr* | **ipv6** *ipv6-addr*} **traps** [*vrf vrfname*] [**version** {**1** | **2c** | **3**  
[**auth** | **noauth** | **priv**]] *community-string* [**udp-port**  
*port-num*][*notification-type*]

**no snmp-server host** {*host-addr* | **ipv6** *ipv6-addr*}

<i>host-addr</i>	SNMP
<i>ipv6-addr</i>	SNMP            ipv6
<i>vrfname</i>	vrf
<b>version</b>	snmp            V1   V2C   V3
<b>auth</b>   <b>noauth</b>   <b>priv</b>	V3
<i>community-string</i>	V3

<i>port-num</i>	snmp
<i>notification-type</i>	snmp

SNMP

```

snmp-server enable traps NMS
SNMP
vrf [ vrf ]
    
```

```

SNMP SNMP
Ruijie(config)# snmp-server host 192.168.12.219 public snmp
    
```

<b>snmp-server enable traps</b>	

-	-

### 30.1.8 snmp-server location

```

SNMP snmp-server location no
SNMP
    
```

**snmp-server location** *text*

**no snmp-server location**

<i>text</i>	

|

|

|

Ruijie(config)# **snmp-server location** start-technology-city 4F of A  
Buliding



	<b>snmp-server queue-length</b>	SNMP
	-	-

### 30.1.10 snmp-server queue-length

#### snmp-server queue-length

**snmp-server queue-length** *length*

	<i>length</i>	1 1000

SNMP

no

SNMP

**snmp-server system-shutdown**

**snmp-server system-shutdown**

**no snmp-server system-shutdown**

-	-

SNMP

SNMP

RGOS

reload/reboot

NMS

SNMP

Ruijie(config)# **snmp-server system-shutdown**

-	-

-	-

### 30.1.12 snmp-server trap-source

SNMP

**snmp-server trap-source**

no

**snmp-server trap-source** *interface*

**no snmp-server trap-source**

<i>interface</i>	SNMP

SNMP

IP

┌

┌

SNMP IP  
IP SNMP

┌

0 IP SNMP

Ruijie(config)# **snmp-server trap-source fastethernet 0**

┌

<b>snmp-server enable traps</b>	
<b>snmp-server enable host</b>	NMS

┌

┌

-	-

### 30.1.13 snmp-server trap-timeout

no

**snmp-server trap-timeout**

**snmp-server trap-timeout** *seconds*

**no snmp-server trap-timeout**

┌

seconds	1 – 1000

┌

30

┌

┌

┌

60

Ruijie(config)# **snmp-server trap-timeout 60**

<b>snmp-server queue-length</b>	
<b>snmp-server enable host</b>	NMS

-	-

### 30.1.14 snmp-server user

SNMP **snmp-server user** no

**snmp-server user** *username groupname* {**v1 | v2 | v3** [encrypted] [auth {md5 | sha} auth-password ] [priv des56 priv-password]][access {[ipv6 ipv6\_aclname ] [aclnum | aclname]]}

**no snmp-server user** *username groupname* {**v1 | v2c | v3** }

<i>username</i>			
<i>groupname</i>			
<b>v1   v2   v3</b>	SNMP	v3	
			16
<b>encrypted</b>	16	SHA	MD5
			20
<b>auth</b>			

SHA

<i>aclnum</i>	MIB ipv4 NMS
<i>aclname</i>	MIB ipv4 NMS
<i>ipv6_aclname</i>	ipv6 MIB ipv6 NMS

└──

└──

└──

```

                                snmpV3          md5          DES
Ruijie(config)# snmp-server user user-2 mib2user v3 auth md5
authpassstr priv des56 despassstr
    
```

<b>show snmp user</b>	SNMP

└──

-	-

### 30.1.15 snmp-server view

|

default

MIB

|

|

|

MIB-2 oid 1.3.6.1

Ruijie(config)# **snmp-server view mib2 1.3.6.1 include**

|

<b>show snmp view</b>	SNMP

|

|

-	-

### 30.1.16 snmp trap link-status

## 30.2

### 30.2.1 show snmp

SNMP

show snmp

**show snmp [mib | user | view | group| host]**

|

-	-

|

|

|

**show snmp**

SNMP

```

show snmp mib                snmp mib
show snmp user             snmp
show snmp view            snmp
show snmp group          snmp
show snmp host
    
```

SNMP

```

Ruijie# show snmp
Chassis: 60FF60
0 SNMP packets input
0 Bad SNMP version errors
0 Unknown community name
0 Illegal operation for community name supplied
0 Encoding errors
0 Number of requested variables
0 Number of altered variables
0 Get-request PDUs
0 Get-next PDUs
0 Set-request PDUs
0 SNMP packets output
0 Too big errors (Maximum packet size 1500)
0 No such name errors
0 Bad values errors
0 General errors
0 Response PDUs
0 Trap PDUs
SNMP global trap: disabled
SNMP logging: disabled
SNMP agent: enabled
    
```

<b>snmp-server chassis-id</b>	SNMP

-	-



## 31.1.2 rmon collection history

**no**

**rmon collection history** *index* [**owner** *ownername*] [**buckets** *bucket-number*] [**interval** *seconds*]

**no rmon collection history** *index*



	-	-

|

|

|

|

1

Ruijie(config)# **interface fast-Ethernet 0/1**

Ruijie(config-if)# **rmon collection stats 1 zhansan**

--	--	--

**rmon collection history** *index*

trap

```
Ruijie(config)# rmon event 1 log trap rmon description  
"ifInNUcastPkts is too much " owner zhangsan
```

---

```
rmon alarm number variable interval{absolute  
| delta}rising-threshold value [event-number]  
falling-threshold value [event-number]
```

Event type : log-and-trap  
Community : public  
Last time sent : 0d:0h:0m:0s  
Owner : zhangsan  
Log : 1  
Log time : 0d:0h:37m:47s  
Log description : ipttl  
Log : 2  
Log time : 0d:0h:38m:56s  
Log description : ipttl



**rmon alarm**

```

Ruijie# show rmon event
Alarm : 1
Interval : 1
Variable : 1.3.6.1.2.1.4.2.0
Sample type : absolute
Last value : 64
Startup alarm : 3
Rising threshold : 10
Falling threshold : 22
Rising event : 0
Falling event : 0
Owner : zhangsan
    
```

<b>rmon event</b> <i>number</i> [ <b>log</b> ] [ <b>trap community</b> ] <i>[description-string]</i>	

-	-

### 31.2.3 show rmon history

**show rmon history**

-	-

```

Ruijie# show rmon history
Entry : 1
Data source : Gil/1
Buckets requested : 65535
Buckets granted : 10
Interval : 1
Owner : zhangsan
Sample : 198
Interval start : 0d:0h:15m:0s
DropEvents : 0
Octets : 67988
Pkts : 726
BroadcastPkts : 502
MulticastPkts : 189
CRCAlignErrors : 0
UndersizePkts : 0
OversizePkts : 0
Fragments : 0
Jabbers : 0
Collisions : 0
Utilization : 0
    
```

<b>rmon collection history</b> <i>index</i> [ <b>owner</b> <i>ownername</i> ] [ <b>buckets</b> <i>bucket-number</i> ] <b>[interval</b> <i>seconds</i> ]	
-	-

### 31.2.4 show rmon statistics



	-	-

## 32 DHCPv6 Client

### 32.1

#### 32.1.1 ipv6 dhcp client pd

DHCPv6 client  
no

**ipv6 dhcp client pd**

**ipv6 dhcp client pd** *prefix-name* [rapid-commit]

**no ipv6 dhcp client pd**



	-	-

## 32.2

### 32.2.1 clear ipv6 dhcp client

DHCPv6

**clear ipv6 dhcp client**

**clear ipv6 dhcp client** *interface-type interface-number*

	<i>interface-type interface-number</i>	

**clear ipv6 dhcp client**

DHCPv6

DHCPv6

Ruijie# **clear ipv6 dhcp client vlan 1**

	-	-

	-	-

DHCPv6 Relay Agent

	<b>show ipv6 dhcp relay destination { all   interface <i>interface-type</i> <i>interface-number</i> }</b>	Relay
	-	
	10.4	

## 33.2

### 33.2.1 show ipv6 dhcp relay destination

DHCPv6 Relay Agent

<b>show ipv6 dhcp relay destination</b>	
<b>all</b>	
<b>interface</b> <i>interface-type</i> <i>interface-number</i>	

```
┌
```

-

```
┌
```

10.4	

### 33.2.2 show ipv6 dhcp relay statistics

```
┌
```

DHCPv6 Relay  
**show ipv6 dhcp relay statistics**

-	-

```
┌
```

```
┌
```

```
┌
```

DHCPv6 Relay

```
┌
```

```

DHCPv6 Relay Agent
Ruijie# show ipv6 dhcp relay statistics
Packets dropped          : 2 //
    Error                 : 2 //
    Excess of rate limit : 0 //
Packets received        : 28 //      DHCPv6
    SOLICIT               : 0
    REQUEST               : 0
    CONFIRM               : 0
    RENEW                 : 0
    REBIND                : 0
    RELEASE               : 0
    DECLINE                : 0
    INFORMATION-REQUEST  : 14
    RELAY-FORWARD        : 0
    RELAY-REPLY          : 14
Packets sent            : 16 //      DHCPv6
    ADVERTISE             : 0
    
```

```

RECONFIGURE          : 0
REPLY                : 8
RELAY-FORWARD        : 8
RELAY-REPLY          : 0
    
```

<b>clear ipv6 dhcp relay statistics</b>	

-

10.4	

### 33.2.3 clear ipv6 dhcp relay statistics

DHCPv6 Relay

**clear ipv6 dhcp relay statistics**

-	-

DHCPv6 Relay

DHCPv6 Relay Agent

0

Ruijie#**clear ipv6 dhcp relay statistics**

<b>show ipv6 dhcp relay statistics</b>	

-

	10.4	



no

**[no] tp-guard port enable**



|

|

tpp

|

Ruijie# **show tpp**

|

<b>topology guard</b>	

|

|

-	-

# 35 RIP

## 35.1

### 35.1.1 address-family RIP

RIP

address-family

no

address-family ipv4 vrf *vrf-name*

no address-family ipv4 vrf *vrf-name*

	<b>vrf <i>vrf-name</i></b>	VRF

RIP

**address-family**  
(config-router-af)#

VRF

	<b>exit-address-family</b>	
	<b>ip vrf</b>	VRF
	-	-

### 35.1.2 auto-summary (RIP)

RIP

**auto-summary**

**no**

**auto-summary**

**no auto-summary**

	-	-



```
RIP
RIPv1  RIPv2
RIP
>      RIP
>      RIP
>
                                RIPv2
                                _____
                                RIPv1
                                /
```



```
                                RIPv2
Ruijie(config)# router rip
```

```
Ruijie(config-router)# version 2
Ruijie(config-router)# no auto-summary
```

<b>version</b>	RIP                    v1   v2 v1&v2

-	-

### 35.1.3 bfd all-interfaces (RIP)

```

RIP                    BFD                    RIP                    bfd
all-interfaces                    no
bfd all-interfaces
no bfd all-interfaces

```



---

<b>router rip</b>		RIP
<b>ip rip bfd [disable]</b>		RIP BFD

---

	-	-

---

### 35.1.4 default-metric (RIP)

RIP **default-metric** **no**

**default-metric** *metric-value*

**no default-metric**

<i>metric-value</i>	1	16		<i>metric-value</i>
	16	RGOS		

---

1

**redistribute**

RIP

Ä

RIP

	<b>redistribute</b>	
		al2°P 'QÇ"j"Û n à=AÓ2°P @
	-	-

### 35.1.5 default-information originate (RIP)

RIP **default-information**  
**originate** **no**  
**default-information originate** [always] [metric *metric-value*] [route-map *map-name*]  
**no default-information originate** [always] [metric] [route-map *map-name*]

	<b>always</b>	

RIP

---



---

```
RIP                                     RIP  
  
r  
  ip default-network  
  default-information originate         RIP
```

---

RIP

```

RIP
RIP 160, 192.168.12.1
123
Ruijie(config)# router rip
Ruijie(config-router)# distance 160
Ruijie(config-router)# distance 123 192.168.12.1 0.0.0.0

```

-	-

-	-

### 35.1.7 distribute-list in RIP

**distribute-list in**

**no**

**distribute-list** {[*access-list-number* | *name*] | **prefix** *prefix-list-name* [**gateway** *prefix-list-name*]} **in** [*interface-type interface-number*]

**no distribute-list** {[*access-list-number* | *name*] | **prefix** *prefix-list-name* [**gateway** *prefix-list-name*]} **in** [*interface-type interface-number*]

<i>access-list-number</i>   <i>name</i>	

```

RIP      Fastethernet 0/0
172.16
Ruijie(config)# router rip
Ruijie(config-router)# network 200.168.23.0
Ruijie(config-router)# distribute-list 10 in
fastethernet 0/0
Ruijie(config-router)# no auto-summary
Ruijie(config)#access-list 10 permit 172.16.0.0 0.0.255.255

```

<b>access-list</b>	
<b>prefix-list</b>	

-	-

### 35.1.8 distribute-list out RIP

**distribute-list out**

**no**

**distribute-list** {[*access-list-number* | *name*] | **prefix** *prefix-list-name*} **out** [**interface** | [**bgp** | **connected** | **isis** [*area-tag*] | **ospf** *process-id* | **rip** | **static**]]

**no distribute-list** {[*access-list-number* | *name*] | **prefix** *prefix-list-name*} **out** [**interface** | [**bgp** | **connected** | **isis** [*area-tag*] | **ospf** *process-id* | **rip** | **static**]]

<b>connected</b>	( )
<b>isis</b> [ <i>area-tag</i> ]	( ) <i>area-tag</i> isis
<b>ospf</b> <i>process-id</i>	( ) ospf <i>process-id</i> ospf
<b>rip</b>	( ) rip
<b>static</b>	( )

### 35.1.9 exit-address-family

**exit-address-family**

**exit-address-family**

	-	-

|

|

|

**exit**

|

```
Ruijie(config-router)# address-family ipv4 vrf vpn1  
Ruijie(config-router-af)# exit-address-family
```



|  
|  
|

|  
|  
|

|  
|  
|

```

                                     key chain
          RIP
RIPv1   RIP       RIPv2
          Serial 0       RIP           ripchain
Ruijie(config)# interface serial 0/0
Ruijie(config-if)# ip rip authentication key-chain
ripchain
```

|  
|  
|



**ip rip authentication mode**

RIP

<b>text</b>	RIP
<b>md5</b>	RIP MD5

┌

┌

RIP	RIP	RIP
	RIP	
		MD5
RIPv1	RIP	RIPv2

```

Serial 0    RIP    MD5
Ruijie(config)# interface serial 0/0
Ruijie(config-if)# ip rip authentication mode md5
    
```

	RIP	RIP
<b>ip rip authentication key-chain</b>	RIPv2	RIP
<b>ip rip authentication text-password</b>	RIPv2	RIP
<b>key chain</b>		

┌

-	-
---	---

### 35.1.12 ip rip authentication text-password

RIP                      RIP                      **ip rip authentication**  
**text-password**                      **no**

**ip rip authentication text-password** *password-string*

**no ip rip authentication text-password**

<i>password-string</i>	1 16

└──

└──

```

RIP
RIPv1    RIP          RIPv2

Serial 0    RIP          ruijie
Ruijie(config)# interface serial 0/0
Ruijie(config-if)# ip rip authentication text-password ruijie
    
```

<b>ip rip authentication mode</b>	RIP
<b>ip rip authentication key-chain</b>	RIP          RIP RIPv2    RIP

└──

RIP

---



RIP

BFD

┌

┌

```

ip rip default-information RIP default-information
originate
r ip rip default-information RIP
    
```

┌

```

ethernet0/0
Ruijie(config)# interface ethernet 0/0
Ruijie(config-if)# ip rip default-information only
    
```

┌

default-information originate	RIP

┌

┌

-	-

### 35.1.15 ip rip receive enable

RIP  
no

RIP RIP RIP

ip rip receive enable

ip rip receive enable

no ip rip receive enable

┌

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┌

RIP

┌

┌

RIP

default no RIP

Fastethernet 0/0                      RIP

Ruijie(config)# **interface fastethernet 0/0**

Ruijie(config-if)# **no ip rip receive enable**



<b>version</b>		RIP
	-	-

### 35.1.17 ip rip send enable

	RIP	RIP	RIP	<b>ip rip send enable</b>
	<b>no</b>	RIP	RIP	
	<b>ip rip send enable</b>			
	<b>no ip rip send enable</b>			
		RIP		
		RIP	<b>default</b>	<b>no</b>
				RIP
		Fastethernet 0/0	RIP	
		Ruijie(config)# <b>interface fastethernet 0/0</b>		
		Ruijie(config-if)# <b>no ip rip send enable</b>		
		<b>ip rip receive enable</b>		RIP
		<b>passive-interface</b>		RIP



### 35.1.19 ip rip send version

<p>RIP</p> <p><b>version</b></p> <p><b>no ip rip send version</b></p>	<p>RIP</p> <p><b>ip rip send version [1] [2]</b></p> <p><b>no ip rip send version</b></p>	<p><b>ip rip receive</b></p>
---	---	------------------------------

<b>1</b>	RIPv1
<b>2</b>	RIPv2

**version**

	<b>vesion</b>	
	RIPv1 RIPv2	RIP

	Fastethernet 0/0	
	RIPv1 RIPv2	

```
Ruijie(config)# interface fastethernet 0/0
Ruijie(config-if)# ip rip send version 1 2
```

<b>version</b>	RIP

-	-

### 35.1.20 ip rip split-horizon (RIP)

RIP	<b>ip rip split-horizon</b>	<b>no</b>
RIP		
<b>ip rip split-horizon</b>		

**no ip rip split-horizon**

-	-

┌

┌

```

IP
X.25
IP
RIP
show ip rip neighbor
RIP

```

```

Fastethernet 0/0 RIP
Ruijie(config)# interface fastethernet 0/0
Ruijie(config-if)# no ip rip split-horizon

```

<b>neighbor RIP</b>	RIP IP
<b>Validate-update-source</b>	RIP

┌

-	-

**35.1.21 ip rip summary-address**

```

RIP ip rip
summary-address no
ip rip summary-address ip-address ip-network-mask
no ip rip summary-address ip-address ip-network-mask

```

<i>ip-address</i>	IP
<i>ip-network-mask</i>	IP

RIP

**ip rip summary-address**

RIP

/

RIPv2

FastEthernet 1/0

172.16.0.0/16

Ruijie(config)# **interface FastEthernet 1/0**

Ruijie(config-if)# **ip rip summary-address 172.16.0.0 255.255.0.0**

Ruijie(config-if)# **ip address 172.16.1.1 255.255.255.0**

Ruijie(config)# **router rip**

Ruijie(config-router)# **network 172.16.0.0**

Ruijie(config-router)# **version 2**

Ruijie(config-router)# **no auto-summary**

<b>auto-summary</b>	RIP





```

network-number wildcard
RIP
wildcard RGOS
RIP
RIP RIP RIP

```



```

RIP 192.168.12.0/24
172.16.0.0/24 RIP
Ruijie(config)# router rip
Ruijie(config-router)# network 192.168.12.0
Ruijie(config-router)# network 172.16.0.0 0.0.0.255

```



-	-



10.4(1)	wildcard

### 35.1.24 neighbor (RIP)

RIP IP neighbor no

**neighbor** *ip-address*

**no neighbor**



<i>ip-address</i>	IP



```
RIPv1      IP      255.255.255.255      RIPv2
          224.0.0.9
                                passive-interface
                                RIP
          passive
```

```
                                RIP      192.168.1.2
Ruijie(config)# router rip
Ruijie(config-router)# passive-interface default
Ruijie(config-router)# neighbor 192.168.1.2
```

```

offset
RIP
RIP offset-list offset-list metric offset-list
acl 7 RIP metric 7
Ruijie(config-router)# offset-list 7 out 7
fastEthernet1/0 acl 8 RIP
metric 7
Ruijie(config-router)# offset-list 7 in 7
Ruijie(config-router)# offset-list 8 in 7 fastEthernet 1/0

```

-	-

-	-

### 35.1.26 output-delay

```

RIP
output-delay no
output-delay delay
no output-delay

```

<i>delay</i>	<8-50>

```

RIP 512 25

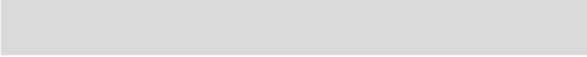
```

25

**output-delay**

```
rip receive enable
```

```
passive ethernet0/0 passive  
Ruijie(config-router)# passive-interface default  
Ruijie(config-router)# no passive-interface ethernet 0/0
```



<b>metric</b> <i>metric-value</i>	metric	metric	metric-value
<b>route-map</b> <i>route-map-name</i>		1-16	

	OSPF		
	ISIS	level-2	
	metric	1	
	route-map		

RIP

RIP 1 T fisis Tc 1.88 0 Td[<02C8074>Tj/TTDA

### 35.1.29 router rip

```

      RIP
no     RIP
router rip
no router rip

```

	-	-

```

      RIP

```

```


```

```

      RIP

```

```

9B7.12 3>JTDD>Tj/TT0 1 Tf2.2T1 1 Tf0ref26D5477.0.0<37C71.(asy)17(nc def

```

	<i>update</i>		<i>update</i>	<i>invalid</i>	<i>flush</i>
			30		

*invalid*

RIP

-	-
---	---

### 35.1.31 validate-update-source

RIP

**validate-update-source no**

**validate-update-source**

**no validate-update-source**

-	-
---	---

┌

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RIP

IP

RIP

RIP

**validate-update-source**

ip unnumbered RIP

**validate-update-source**

┌  
┌

Ruijie(config)# **router rip**

Ruijie(config-router)# **no validate-update-source**

<b>ip rip split-horizon</b>	RIP
<b>ip unnumbered</b>	IP
<b>neighbor (RIP)</b>	RIP IP

### 35.1.32 version (RIP)

RIP

version

no

version {1 | 2}

no version

1	RIP	1
2	RIP	2

RIPv1 RIPv2

RIPv1

RIP

ip rip receive version

## 35.2.1 show ip rip

RIP

show ip rip

show ip rip [vrf vrf-name]

vrf vrf-name	VRF	RIP
--------------	-----	-----

```

┌
└

```

```

┌
└

```

rip	RIP	metric	distance	rip
VRF	VRF	VRF	VRF-id	

```

1
RIP
Ruijie# show ip rip
Routing Protocol is "rip"
Sending updates every 10 seconds, next due in 4 seconds
Invalid after 20 seconds, flushed after 10 seconds
Outgoing update filter list for all interface is: not set
Incoming update filter list for all interface is: not set
Default redistribution metric is 2
Redistributing: connected
Default version control: send version 2, receive version 2
Interface          Send  Recv
FastEthernet 1/1    2     2
FastEthernet 1/0    2     2
Routing for Networks:
192.168.26.0 255.255.255.0
192.168.64.0 255.255.255.0
Distance: (default is 50)

2
vrf          RIP
Ruijie(config-router)# sh ip rip vrf 1
VRF 1 VRF-id:1
Routing Protocol is "rip"
Sending updates every 30 seconds, next due in 4 seconds

```



```

192.168.1.0/24    auto-summary
192.168.1.0/30    directly connected, Loopback 3
192.168.1.8/30    directly connected, FastEthernet 0/0
192.168.121.0/24  auto-summary
192.168.121.0/24  redistributed
[1] via 192.168.2.22, FastEthernet 0/1
    2                RIP                192.168.121.0/24

```

```

Ruijie# show ip rip database 192.168.121.0 255.255.255.0
192.168.121.0/24  redistributed
[1] via 192.168.2.22, FastEthernet 0/1
    3                RIP

```

```

Ruijie# show ip rip database count

```

	All	Valid	Invalid
database	5	5	0
auto-summary	5	5	0
connected	1	1	0
rip	4	4	0

<b>show ip rip</b>	

-	-

### 35.2.3 show ip rip external

RIP

**show ip rip external**

```

show ip rip external [bgp | connected | isis [process-name] | ospf <1-65535> | static]
[vrf vrf-name]

```

<b>bgp   connected   isis   ospf   static</b>	

<b>vrf</b> <i>vrf-name</i>	VRF	RIP
<i>process-name</i>	ISIS	
<1-65535>	OSPF	



```
BFD: Enabled
V2 Broadcast: Disabled
Multicast registe: Registered
Interface Summary Rip:
  Not Configured
IP interface address:
  2.2.2.111/24
```

<b>show ip rip</b>	

-	-

# 36 OSPF

## 36.1

### 36.1.1 area

```
no OSPF
area 3 6
```

	10.4(1)	

### 36.1.2 area authentication

OSPF area authentication no  
 OSPF

**area *area-id* authentication [*message-digest*]**

**no area *area-id* authentication**

5	<i>area-id</i> 2	OSPF IP

## OSPF

---

<b>ip ospf authentication-key</b>	OSPF
<b>ip ospf message-digest-key</b>	OSPF MD5
<b>area virtual-link</b>	

```
Ruijie(config-router)# area 1 default-cost 50
```

<b>area stub</b>	OSPF	
<b>area nssa</b>	OSPF	NSSA

-	-

### 36.1.4 area filter-list

ABR                      area filter-list

**area** *area-id* **filter-list** [**access** *acl-name* | **prefix** *prefix-name*] [**in** | **out**]

**no area** *area-id* **filter-list** [**access** *acl-name* | **prefix** *prefix-name*] [**in** | **out**]

<i>area-id</i>	
' <i>acl-name</i>	acl
' <i>prefix-name</i>	prefix-list
' <b>access</b>   <b>prefix</b>	prefix list    ACL
' <b>in</b>   <b>out</b>	

```
ABR
ABR
```

	-	-

L

	-	-

LSA	ASBR	(	ABR)			Type-7
LSA						
<b>no-redistribution</b>	ASBR		OSPF	redistribute		
NSSA			NSSA	ASBR	ABR	
			NSSA			
	NSSA			LSA	ABR	
no-summary		ABR	NSSA	summary LSAs	Type-3 LSA	
<b>area default-cost</b>			NSSA	ABR		
		NSSA				NSSA
	1					



```

OSPF
no
area area-id stub [no-summary]
no area area-id stub [no-summary]

```

area-id	STUB
no-summary	ABR ABR

```

OSPF (LSA) 1 1 area stub ABR
LSA LSA 2 2 LSA 3 3
ABR OSPF
ABR area stub OSPF
ABR no-summary
OSPF area stub area default-cost
area stub area default-cost ABR
area default-cost

```

```

1
Ruijie(config)# router ospf 1
Ruijie(config-router)# network 172.16.0.0 0.0.255.255 area 0
Ruijie(config-router)# network 192.168.12.0 0.0.0.255 area 1
Ruijie(config-router)# area 1 stub

```

area default-cost	STUB OSPF

--	--



# OSPF

<b>message-digest</b>	MD5
<b>null</b>	

**dead-interval** 40  
**hello-interval** 10  
**retransmit-interval** 5  
**transmit-delay** 1

OSPF

ABR ABR Stub Area  
NSSA  
*router-id* OSPF *router-id* **show ip ospf**  
**neighbor** Loopback  
**area virtual-link** OSPF  
**area authentication**

1 1 2.2.2.2

Ruijie(config)# **router ospf 1**

Ruijie(config-ospf-1)# **area 0.0.0.0** **authentication** **md5** **1** **172.16.1.1** **2.2.2.2** **0** **TC2\_(ro/C253.j/T10-router/**

**OSPF**

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-	-

### 36.1.10 bfd all-interfaces (OSPF)

```

      OSPF          BFD          OSPF          bfd
all-interfaces          no
bfd all-interfaces
no bfd all-interfaces
  
```

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┌

┌

┌

```

      OSPF          Hello          OSPF          BFD          BFD
      FULL          BFD          BFD          BFD
      OSPF
      ip ospf bfd [disable]          BFD
      bfd all-interfaces
  
```

### 36.1.11 clear ip ospf process

OSPF

**clear ip ospf [*process-id*] process**

process-id	OSPF OSPF OSPF

RFC2328

OSPF

OSPF 1  
Ruijie# **clear ip ospf 1 process**

-	-

-	-

### 36.1.12 compatible rfc1583

AS

RFC1583

RFC2328

**compatible rfc1583**

**no compatible rfc1583**

--	--

## OSPF

	-	-
	RFC1583	
	rfc 2328	
	Ruijie(config)# <b>router ospf 1</b>	
	Ruijie(config-router)# <b>no compatible rfc1583</b>	
	<b>show ip ospf</b>	ospf
	-	-

### 36.1.13 default-information originate OSPF

OSPF

**default-information**

**originate no**

**default-information originate** [always] [metric *metric*] [metric-type *type*] [route-map *map-name*]

**no default-information originate** [always] [metric] [metric-type *type*] [route-map *map-name*]

<b>always</b>	OSPF
<b>metric <i>metric</i></b>	0-16777214

<b>metric-type</b> <i>type</i>	2	1	OSPF	1
--------------------------------	---	---	------	---

|

|

-	-

### 36.1.14 default-metric

OSPF default-metric  
no

**default-metric** *metric*

**no default-metric**

|

<i>metric</i>	OSPF 1-16777214

|

20

|

|

**default-metric** **redistribute**  
**default-metric** **default-information originate** OSPF

|

OSPF 50

```
Ruijie(config)# router ospf 1
Ruijie(config-router)# network 192.168.12.0
Ruijie(config-router)# version 2
Ruijie(config-router)# exit
Ruijie(config)# router ospf
Ruijie(config-router)# network 172.16.10.0 0.0.0.255 area 0
Ruijie(config-router)# default-metric 50
Ruijie(config-router)# redistribute rip subnets
```

|

--	--

<b>redistribute</b>	
<b>show ip ospf</b>	ospf
-	-

### 36.1.15 discard-route

discard                          no                          discard

**discard-route {internal|external}**

**no discard-route {internal|external}**

<b>internal</b>	area range discard
<b>external</b>	summary-address      discard

discard

ABR    ASBR            discard

area range            discard

Ruijie(config)# **router ospf 1**

Ruijie(config-router)# **no discard-route internal**

<b>area range</b>	OSPF
<b>summary-address</b>	OSPF

|

|

-	-

### 36.1.16 distance ospf

OSPF

**distance** {*distance* | **ospf** { *intra-area distance* | *inter-area distance* | *external distance* }}

**no distance** [**ospf**]

|

<i>distance</i>	1-255
<b>intra-area distance</b>	1-255
<b>inter-area distance</b>	1-255
<b>external distance</b>	1-255

|

```

110
      110
      110
      110
    
```

|

OSPF

|

OSPF

|

```

                                OSPF                160
Ruijie(config)# router ospf 1
Ruijie(config-router)# distance ospf external 160
    
```





### 36.1.18 distribute-list out

#### redistribute

**distribute-list** {[*access-list-number* | *name*] | **prefix** *prefix-list-name*} **out** [**bgp** | **connected** | **isis** [*area-tag*] | **ospf** *process-id* | **rip** | **static**]

**no distribute-list** {[*access-list-number* | *name*] | **prefix** *prefix-list-name*} **out** [**bgp** | **connected** | **isis** [*area-tag*] | **ospf** *process-id* | **rip** | **static**]

access-list-number   name	acl
<b>prefix</b> prefix-list-name	prefix-list
<b>bgp</b>   <b>connected</b>   <b>isis</b> [ <i>area-tag</i> ]   <b>ospf</b> <i>process-id</i>   <b>rip</b>   <b>static</b>	

└──

└──

<b>distribute-list out</b>	<b>redistribute route-map</b>		<b>OSPF</b>
ACL	prefix-list	<b>redistribute</b>	
ACL	, prefix-list		

└──

```
Ruijie(config)# router ospf 1
Ruijie(config-router)# redistribute static subnets
Ruijie(config-router)# distribute-list 22 out static
Ruijie(config-router)# distribute-list prefix jjj out static
% Access-list filter exists, please de-config first
```

<b>distribute-list in</b>	LSA
<b>redistribute</b>	

└──

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### 36.1.19 enable mib-binding

enable mib-binding      MIB

### 36.1.20 enable traps

OSPFv2                      16    TRAP                      4  
 TRAP    no    TRAP

**enable traps** [error [ifauthfailure | ifconfigerror | ifrxbadpacket | virtifauthfailure | virtifconfigerror | virtifrxbadpacket] | lsa [lsdbapproachoverflow | lsdboverflow | maxagelsa | originatelsa] | retransmit [iftxretransmit | virtiftxretransmit] | state-change [ifstatechange | nbrstatechange | virtifstatechange | virtnbrstatechange]]

**no enable traps** [error [ifauthfailure | ifconfigerror | ifrxbadpacket | virtifauthfailure | virtifconfigerror | virtifrxbadpacket] | lsa [lsdbapproachoverflow | lsdboverflow | maxagelsa | originatelsa] | retransmit [iftxretransmit | virtiftxretransmit] | state-change [ifstatechange | nbrstatechange | virtifstatechange | virtnbrstatechange | restartstatuschange | nbrrestarthelperstatuschange | virtnbrrestarthelperstatuschange]]

<b>error</b>	error traps error traps <b>ifauthfailure</b> <b>ifconfigerror</b> <b>ifrxbadpacket</b> <b>virtifauthfailure</b> <b>virtifconfigerror</b> <b>virtifrxbadpacket</b>
<b>lsa</b>	lsa traps lsa traps <b>lsdbapproachoverflow</b> LSA  <b>lsdboverflow</b> LSA <b>maxagelsa</b> LSA <b>originatelsa</b> LSA
<b>retransmit</b>	retransmit traps retransmit traps <b>iftxretransmit</b> <b>virtiftxretransmit</b>

	state-change traps state-change traps <b>ifstatechange</b> <b>nbrstatechange</b> <b>virtifstatechange</b> <b>virtnbrstatechange</b> <b>restartstatuschange</b> GR Restarter  <b>nbrrestarthelperstatuschange</b> GR  <b>virtnbrrestarthelperstatuschange</b> GR
--	---

traps

	<b>snmp-server</b> enable traps MIB	<b>snmp-server enable</b> ospf trap TRAP
--	---	--

```

Ruijie(config)# router ospf 100
Ruijie(config-router)# enable traps
    
```

<b>show ip ospf</b>	OSPF
<b>enable mib-binding</b>	OSPFv2 MIB
<b>snmp-server enable traps ospf</b>	OSPF TRAP

10.4(1)	

### 36.1.21 graceful-restart

OSPF (graceful restart GR) graceful-restart  
 graceful-restart grace-period grace period  
 no

graceful-restart [grace-period *grace-period*]

no graceful-restart [grace-period]

<b>grace-period</b>	grace-period
<i>grace-period</i>	GR OSPF 1-1800

GR Restart  
 Grace-period 120s

OSPF OSPF OSPF OSPF GR  
 OSPF OSPF  
**graceful-restart GR 120 graceful-restart grace-period**

OSPF 1 GR GR  
 Ruijie(config)# **router ospf 1**  
 Ruijie(config-router)# **graceful-restart**  
 Ruijie(config-router)# **graceful-restart grace-period 60**

<b>graceful-restart helper</b>	OSPF

-	-

### 36.1.22 graceful-restart helper

OSPF (GR helper) graceful-restart helper  
no

**graceful-restart helper {disable | {strict-lsa-checking | internal-lsa-checking}}**

**no graceful-restart helper {disable | {strict-lsa-checking | internal-lsa-checking}}**

<b>disable</b>	
<b>strict-lsa-checking</b>	GR Helper types 1-5,7 LSA GR Helper
<b>internal-lsa-checking</b>	GR Helper types 1-3 LSA GR Helper

types 1- 6Ñ ođ!À™1 w q 1 •7U ~ý„Zø^cđ À 8'c ÄÄ on ðÀl@Ñi0KÈEà”z5\$  
Ä 5%Y }hñ ja~A Ä

<b>graceful-restart</b>	OSPF
-	-

### 36.1.23 ip ospf authentication

no

**ip ospf authentication [message-digest | null]**

**no ip ospf authentication**

<b>message-digest</b>	MD5
<b>null</b>	

```

Ruijie(config)# ip ospf authentication message-digest
Ruijie(config)# ip ospf authentication null
Ruijie(config)# no ip ospf authentication
    
```

```

Ruijie(config)# interface FastEthernet 0/0
Ruijie(config-if)# ip address 172.16.10.0 255.255.255.0
Ruijie(config-if)# ip ospf authentication message-digest
    
```

<b>area authentication</b>	OSPF
<b>ip ospf authentication-key</b>	OSPF
<b>ip ospf message-digest-key</b>	OSPF MD5

┌

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### 36.1.24 ip ospf authentication-key

OSPF  
no

**ip ospf authentication-key**

**ip ospf authentication-key** *key*

**no ip ospf authentication-key**

┌

<i>Key</i>	8

┌

┌

**ip ospf authentication-key**

OSPF

OSPF

OSPF

**area authentication**

**ip ospf authentication**

,

┌

```

FastEthernet 0/0      OSPF      ospfauth
Ruijie(config)# interface fastethernet 0/0
Ruijie(config-if)# ip address 172.16.10.0 255.255.255.0
Ruijie(config-if)# ip ospf authentication-key ospfauth
    
```

┌

<b>area authentication</b>	OSPF
<b>ip ospf authentication</b>	

┌

┌

-	-

### 36.1.25 ip ospf bfd

```

      OSPF          BFD          ip
ospf bfd [disable] no          ip ospf bfd
ip ospf bfd [disable]
no ip ospf bfd
    
```

┌

<b>disable</b>	OSPF      BFD

┌

OSPF                  BFD

┌

**bfd all-interfaces**

"

OSPF

	-	-
--	---	---

### 36.1.26 ip ospf cost

	OSPF no ip ospf cost cost	OSPF ip ospf cost
	no ip ospf cost	
	<i>cost</i>	OSPF

	/Bandwidth	100Mbps
--	------------	---------

	OSPF bandwidth OSPF	100Mbps/Bandwidth Bandwidth
>	64K cost 1562	
>	E1 cost 48	
>	10M cost 10	
>	100M cost 1	
	<b>ip ospf cost</b>	OSPF

0\_0 1 Tf0 Tc 2.958 0 006651C4>Tj/TT1 1 Tf1 0 Td( )Tj/C2\_0 1 TTT3.0016 Tc 7.20021 T

	-	-
--	---	---

### 36.1.27 ip ospf database-filter all out

```

no
ip ospf database-filter all out
no ip ospf database-filter
    
```

	-	-

		LSA
--	--	-----

--	--	--

	LSA	LSA
	LSA	LSA

```

LSA serial 1/0
Ruijie(config)# interface serial 1/0
Ruijie(config-if)# ip address 172.16.10.1 255.255.255.0
Ruijie(config-if)# encapsulation ppp
Ruijie(config-if)# ip ospf database-filter all out
    
```

	-	-

--	--	--

	-	-

### 36.1.28 ip ospf dead-interval

OSPF  
no

ip ospf dead-interval

ip ospf dead-interval *seconds*

no ip ospf dead-interval

<i>seconds</i>	1-65535

ip ospf hello-interval 4

```

OSPF          Hello          OSPF
Hello         4              hello
                OSPF
>              hello
>

```

```

serial 1/0    OSPF          30
Ruijie(config)# interface serial 1/0
Ruijie(config-if)# ip address 172.16.10.1 255.255.255.0
Ruijie(config-if)# encapsulation ppp
Ruijie(config-if)# ip ospf dead-interval 30

```

ip ospf hello-interval	OSPF Hello

-	-

### 36.1.29 ip ospf disable all

ospf



```

    10
  PPP HDLC      10
                10
                X.25  30
  
```

```

hello          hello          OSPF
                                hello
                                hello
  
```

```

                serial 1/0      OSPF      Hello          15
Ruijie(config)# interface serial 1/0
Ruijie(config-if)# ip address 172.16.10.1 255.255.255.0
Ruijie(config-if)# encapsulation ppp
Ruijie(config-if)# ip ospf hello-interval 15
  
```

<b>ip ospf dead-interval</b>	OSPF

-	-

### 36.1.31 ip ospf message-digest-key

```

    OSPF      MD5          ip ospf message-digest-key
no          OSPF      MD5
  
```

**ip ospf message-digest-key *key-id* md5 *key***  
**no ip ospf message-digest-key**

<i>key</i>	16
<i>key-id</i>	

MD5

**ip ospf message-digest-key**

OSPF

OSPF

OSPF

**area authentication  
ip ospf authentication**

RGOS

MD5  
OSPF MD5

OSPF

FastEthernet 0/0

OSPF

hello5

Ruijie(config)# **interface Serial 1/0**

Ruijie(config-if)# **ip address 172.16.24.2 255.255.255.0**

Ruijie(config-if)# **ip ospf authentication message-digest**

Ruijie(config-if)# **ip ospf message-digest-key 10 md5 hello10**

Ruijie(config-if)# **ip ospf message-digest-key 5 md5 hello5**

Ruijie(config)# **interface Serial1/0**

Ruijie(config-if)# **no ip ospf message-digest-key 10 md5 hello10**

<b>area authentication</b>	OSPF
<b>ip ospf authentication</b>	

-	-

**OSPF**

**OSPF**

```

>
>
                                X.25                                IP
broadcast

1
Ruijie(config)# interface Serial1/0
Ruijie(config-if)# ip address 172.16.24.4 255.255.255.0
Ruijie(config-if)# encapsulation frame-relay
Ruijie(config-if)# ip ospf network broadcast

2

Ruijie(config)# interface Serial1/0
Ruijie(config-if)# ip address 172.16.24.4 255.255.255.0
Ruijie(config-if)# encapsulation frame-relay
Ruijie(config-if)# ip ospf network point-to-multipoint
3                                DR/RDR

                                DR/BDR
Ruijie(config)# interface Serial1/0
Ruijie(config-if)# ip address 172.16.24.4 255.255.255.0
Ruijie(config-if)# encapsulation frame-relay
Ruijie(config-if)# ip ospf network broadcast
Ruijie(config-if)# ip ospf priority 0
    
```

<b>dialer map ip</b>	IP	
<b>frame-relay map</b>	IP	DLCI
<b>neighbor OSPF</b>	IP	NBMA
<b>X25 map</b>	IP	X.25

-	-

### 36.1.34 ip ospf priority

OSPF

**ip ospf priority**

**no**

LSU  
**retransmit-interval**                    **no**                    **ip ospf**  
**ip ospf retransmit-interval** *seconds*  
**no ip ospf retransmit-interval**

<i>seconds</i>	LSU	1-65535

┌  
└

┌  
└

5

**retransmit-interval**                    LSU                    LSU                    **ip ospf**  
LSU                    area virtual-link

**no ip ospf transmit delay**

	<i>seconds</i>	OSPF LSU 1-65535

1

```

                                detail                                Full                                Full

```

```


```

```


```

```

Ruijie(config)# router ospf 1
Ruijie(config-router)# log-adj-changes detail

```

show ip ospf	ospf

```


```

-	-

### 36.1.38 max-concurrent-dd

```

                                DD
max-concurrent-dd <1-65535>
no max-concurrent-dd

```

<1-65535>	DD

```

5

```

```


```

```

                                DD                                OSPF

```

```

                                DD                                4
Ruijie(config)# router ospf 10

```

**OSPF**

OSPF

```

Hello      OSPF      Hello      Hello
           OSPF      DR/BDR    0         Hello
           0         DR/BDR    DR/BDR    DR/BDR
           Hello
           ,
           ,
           cost
    
```

```

           OSPF      IP      172.16.24.2
1         150
Ruijie(config)# router ospf 20
Ruijie(config-router)# network 172.16.24.0 0.0.0.255 area 0
Ruijie(config-router)# neighbor 172.16.24.2 priority 1
poll-interval 150
    
```

ip ospf priority 1	0.0.0.0
ip ospf network	OSPF

--	--

OSPF

```

ip-address wildcard
OSPF OSPF IP network area
IP network area IP IP
OSPF OSPF network IP
OSPF OSPF

```

```

0 1 172.16.16.0 IP 192.168.12.0/24
1 IP 172.16.16.0/20
172.16.16.0 0
Ruijie(config)# router ospf 20
Ruijie(config-router)# network 172.16.16.0 0.0.15.255 area
172.16.16.0
Ruijie(config-router)# network 192.168.12.0 0.0.0.255 area 1
Ruijie(config-router)# network 0.0.0.0 255.255.255.255 area 0

```

router ospf	OSPF

-	-

### 36.1.41 overflow database

OSPF LSA

**overflow database** <1-4294967294> hard | soft

**no overflow database**

<1-4294967294>	LSA

## OSPF

<b>hard   soft</b>	hard LSA	soft LSA	OSPF
	OSPF	LSA	
soft	OSPF	hard	OSPF
	LSA 10	OSPF 10	
	Ruijie# config terminal		
	Ruijie(config)# router ospf 10		
	Ruijie(config-router)# overflow database 10 hard		
	-		-
	-		-

### 36.1.42 overflow database external

external LSA

```

external-LSA
external-LSA      external-LSA
    
```

```

external-LSA      max-dbsize
external-LSA      external-LSA      wait-time
external-LSA
-----
OSPF
max-dbsize
r      1      Full
      2
      3      AS-External-LSA
    
```

```

external lsa      10      overflow      overflow
      3
Ruijie# config terminal
Ruijie(config)# router ospf 10
Ruijie(config-router)# overflow database external 10 3
    
```

-	-

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-	-

### 36.1.43 overflow memory-lack

OSPF      OVERFLOW      no

**overflow memory-lack**

**no overflow memory-lack**

--	--

OSPF

no	OSPF	OVERFLOW
----	------	----------

OSPF OVERFLOW

```

OSPF OVERFLOW
      OSPF OVERFLOW
                OSPF NULL
                OVERFLOW
      clear ip ospf process OSPF OSPF
OVERFLOW
      no OSPF OVERFLOW
      OSPF
  
```

```

1 OSPF OVERFLOW
Ruijie(config)# router ospf 1
Ruijie(config-router)# no overflow memory-lack
  
```

<b>clear ip ospf process</b>	OSPF
<b>show ip protocols ospf</b>	OSPF

--	--

<b>type number</b>	
<b>default</b>	

OSPF

```

serial 1/0
Ruijie(config)# router ospf 30
Ruijie(config-router)# passive-interface serial1/0
    
```

<b>show ip ospf interface</b>	

-	-

### 36.1.45 redistribute

**redistribute** {bgp | connected | isis [*area-tag*] | ospf *process-id* | rip | static} [{level-1 | level-1-2 | level-2} | match {internal |

**OSPF**

<b>isis</b> <i>[area-tag]</i>	isis	<i>area-tag</i>	isis
<b>ospf</b> <i>process-id</i>	ospf	<i>process-id</i> 1-65535	ospf
<b>rip</b>	rip		
<b>static</b>			
<b>level-1   level-1-2   level-2</b>	level IS-IS	IS-IS	level-2
<b>match</b>		OSPF	OSPF
<b>metric</b> <i>metric-value</i>	OSPF external 2 LSA metric-value	metric	0-16777214
<b>metric-type</b> {1 2}		E-1 E-2	
<b>route-map</b> <i>route-map-name</i>			
<b>subnets</b>			
<b>tag</b> <i>tag-value</i>	OSPF 0-4294967295	tag	

OSPF  
 ISIS level-2  
 BGP metric 1 LSA metric 20  
 metric-type E-2  
 route-map

```

                                OSPF  ISIS
                                route-map                                match

level

1                                ospf 2  isis isis-001                OSPF
Ruijie(config)# router ospf 1
Ruijie(config-router)# redistribute ospf 2 subnets
Ruijie(config-router)# redistribute ospf 2 match
external 1 internal
Ruijie(config-router)# redistribute isis isis-001
Ruijie(config-router)# redistribute isis isis-001 level-1

2 Show run
router ospf 1
redistribute ospf 2 match external 1 internal subnets
redistribute isis isis-001 level-1-2
    
```

<b>summary-address</b>	OSPF
<b>default-metric</b>	OSPF

-	-

### 36.1.46 router ospf

```

                                OSPF                                OSPF                                router ospf
                                no                                OSPF

router ospf
router ospf process-id [vrf vrf-name]
no router ospf process-id
    
```

<i>process-id</i>	OSPF 1
<i>vrf-name</i>	VRF OSPF VRF

|

OSPF

|

|

RGOS10.1

OSPF

OSPF

|

**vrf vpn\_1 OSPF 10**

Ruijie(config)# **router ospf 10 vrf vpn\_1**

|

<b>show ip protocols</b>	
<b>show ip ospf</b>	ospf

|

|

-	-

### 36.1.47 router-id

Router ID                    ID,                    no                    Router ID

**router-id router-id**

**no router-id**

|

<i>router-id</i>	ID, IP

OSPF                    loopback                    IP                    OSPF

                         IP                    loopback                    OSPF

## OSPF

---

router-id

LSA

router-id 0.0.0.36

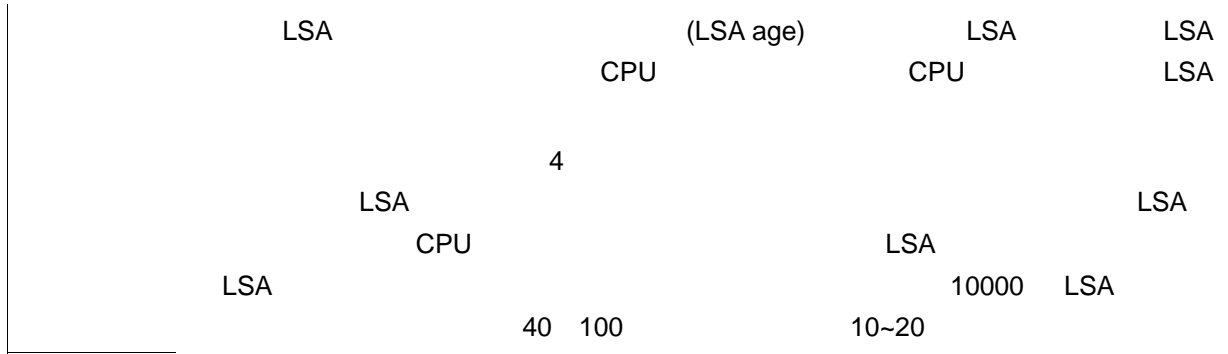
Ruijie(config)# **router ospf 20**

Ruijie(config-router)# **router-id 0.0.0.36**

---

**show ip protocols**





```
120
Ruijie(config)#router ospf 20
Ruijie(config-router)#timers lsa-group-pacing 120
```

```

1 RGOS 10.4 timers throttle spf
  timers spf 5 10
2 RGOS 10.4 timers throttle spf timers spf
  SPF timers throttle spf timers
throttle spf
  
```

```

spf-delay spf-holdtime OSPF
CPU
r timers spf timers throttle spf
  
```

```

OSPF 3 9
Ruijie(config)# router ospf 20
Ruijie(config-router)# timers spf 3 9
  
```

<b>show ip ospf</b>	ospf
<b>timers throttle spf</b>	SPF timers spf timers throttle spf timers spf

10.1	

### 36.1.51 timers throttle spf

```

OSPF
SPF
timers throttle spf
SPF
no
  
```

**timers throttle spf** *spf-delay spf-holdtime spf-max-waittime*

**no timers throttle spf**

--	--

**OSPF**

<i>spf-delay</i>	SPF 1-600000 OSPF SPF <i>spf-delay</i>
<i>spf-holdtime</i>	SPF 1-600000
<i>spf-max-waittime</i>	SPF 1-600000

*spf-delay* 1000  
*spf-holdtime* 5000  
*spf-max-waittime* 10000

*spf-delay* SPF SPF *spf-holdtime* SPF  
 SPF *spf-max-waittime* SPF  
 SPF  
*spf-holdtime* SPF  
*spf-delay* *spf-holdtime* *spf-max-waittime*  
 SPF SPF 50.7903 <0A5<4175CC21A834>1

OSPF

---

<b>show ip ospf</b>	ospf	
<b>timers spf</b>	SPF	10.4
	RGOS	SPF
		timers
	throttle spf	timers spf

```
This router is an ASBR (injecting external routing information)
SPF schedule delay 5 secs, Hold time between two SPFs 10 secs
LsaGroupPacing: 240 secs
Number of incoming current DD exchange neighbors 0/5
Number of outgoing current DD exchange neighbors 0/5
Number of external LSA 4. Checksum 0x0278E0
Number of opaque AS LSA 0. Checksum 0x000000
Number of non-default external LSA 4
External LSA database is unlimited.
Number of LSA originated 6
Number of LSA received 2
Log Neighbor Adjacency Changes : Enabled
Graceful-restart disabled
Graceful-restart helper support enabled
Number of areas attached to this router: 1
Area 0 (BACKBONE)
Number of interfaces in this area is 1(1)
Number of fully adjacent neighbors in this area is 1
Area has no authentication
SPF algorithm last executed 00:01:26.640 ago
SPF algorithm executed 4 times
Number of LSA 3. Checksum 0x0204bf
Area 1 (NSSA)
Number of interfaces in this area is 1(1)
Number of fully adjacent neighbors in this area is 0
Number of fully adjacent virtual neighbors through this area is 0
Area has no authentication
SPF algorithm last executed 02:09:23.040 ago
SPF algorithm executed 4 times
Number of LSA 6. Checksum 0x028638
NSSA Translator State is elected
    OSPF   BFD   ,           "BFD is enabled",
Ruijie# show ip ospf
Routing Process "ospf 1" with ID 1.1.1.1
Process uptime is 4 minutes
Process bound to VRF default
Conforms to RFC2328, and RFC1583Compatibility flag is enabled
Supports only single TOS(TOS0) routes
Supports opaque LSA
```

Supports Graceful Restart  
This router is an ASBR (injecting external routing information)  
SPF schedule delay 5 secs, Hold time between two SPFs 10 secs  
LsaGroupPacing: 240 secs  
Number of incoming current DD exchange neighbors 0/5  
Number of outgoing current DD exchange neighbors 0/5  
Number of external LSA 4. Checksum 0x0278E0  
Number of opaque AS LSA 0. Checksum 0x000000  
Number of non-default external LSA 4  
External LSA database is unlimited.  
Number of LSA originated 6  
Number of LSA received 2  
Log Neighbor Adjacency Changes : Enabled  
Graceful-restart disabled  
Graceful-restart helper support enabled  
Number of areas attached to this router: 1  
**BFD is enabled**  
Area 0 (BACKBONE)  
Number of interfaces in this area is 1(1)  
Number of fully adjacent neighbors in this area is 1  
Area has no authentication  
SPF algorithm last executed 00:01:26.640 ago  
SPF algorithm executed 4 times  
Number of LSA 3. Checksum 0x0204bf  
Area 1 (NSSA)  
Number of interfaces in this area is 1(1)  
Number of fully adjacent neighbors in this area is 0  
Number of fully adjacent virtual neighbors through this area is 0  
Area has no authentication  
SPF algorithm last executed 02:09:23.040 ago  
SPF algorithm executed 4 times  
Number of LSA 6. Checksum 0x028638  
NSSA Translator State is elected



Conforms to RFC2328	RFC2328
RFC1583Compatibility flag	RFC2328 RFC1583 ASBR
Support Tos	TOS0
Supports opaque LSA	opaque-LSA
Graceful-restart	RFC3623 Graceful Restart GR Restart
Graceful-restart helper	RFC3623 Graceful Restart GR Help
Router Type	OSPF normal ABR ASBR
SPF Delay	SPF
SPF-holdtime	SPF
LsaGroupPacing	LSA
Incomming current DD exchange neighbors	exstart incomming
Outgoing current DD exchange neighbors	exstart outgoing
Number of external LSA	LSA
External LSA Checksum Sum	LSA
Number of opaque LSA	opaque-LSA
Opaque LSA Checksum Sum	opaque-LSA
Number of non-default external LSA	external-LSA
External LSA database limit	external-LSA
Exit database overflow state interval	overflow
Database overflow state	OSPF overflow
Number of LSA originated	LSA
Number of LSA received	LSA
Log Neighbor Adjency Changes	
Number of areas attached to this router	
Area type	, Default, Stub,NSSA

Number of interfaces in this area	
Number of fully adjacent neighbors in this area	Full
Number of fully adjacent virtual neighbors through this area	Full
Area authentication	
SPF algorithm last executed	SPF
SPF algorithm executed times	SPF
Number of LSA	LSA
Checksum Sum	LSA
NSSA Translator State	NSSA LSA      External LSA NSSA              ABR      OSPF
BFD is enabled	OSPF    BFD

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### 36.2.2 show ip ospf border-routers

ABR/ASBR    OSPF  
border-routers

show ip ospf

show ip ospf [*process-id*] border-routers

<i>process-id</i>	ospf

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```

show ip route
ABR ASBR OSPF OSPF
OSPF OSPF
    
```

**show ip ospf border-routers**

Ruijie# **show ip ospf border-routers**

OSPF internal Routing Table

Codes: i - Intra-area route, I - Inter-area route

i 1.1.1.1 [2] via 10.0.0.1, FastEthernet 0/1, ABR, ASBR, Area 0.0.0.1  
select

Codes	i I
I	
1.1.1.1	OSPF
[2]	cost
via 10.0.0.1	
FastEthernet 0/1	
ABR, ASBR	ABR ASBR
Area 0.0.0.1	
select	ASBR select

-	-

Ä

LSAs

**show ip ospf** [*process-id area-id*] **database** [*adv-router ip-address* | {*asbr-summary* | *external* | *network* | *nssa-external* | *opaque-area* | *opaque-as* | *opaque-link* | *router* | *summary*} [*link-state-id*] [{*adv-router ip-address* | **self-originate**}] | **database-summary** | **max-age** | **self-originate**]

<i>area-id</i>	
<b>adv-router</b>	
<i>link-state-id</i>	OSPF
<b>self-originate</b>	
<b>max-age</b>	LSA
<b>router</b>	OSPF
<b>network</b>	OSPF
<b>summary</b>	OSPF
<b>asbr-summary</b>	ASBR
<b>external</b>	OSPF
<b>nssa-external</b>	OSPF
<b>opaque-area</b>	LSA
<b>opaque-as</b>	LSA
<b>opaque-link</b>	LSA
<b>database-summary</b>	OSPF LSA

OSPF  
OSPF

1 **show ip ospf database**  
Ruijie# **show ip ospf database**  
OSPF Router with ID (1.1.1.1) (Process ID 1)

## Router Link States (Area 0.0.0.0)

Link ID	ADV Router	Age	Seq#	CkSum	Link count
1.1.1.1	1.1.1.1	2	0x80000011	0x6f39	2
3.3.3.3	3.3.3.3	120	0x80000002	0x26ac	1

## Network Link States (Area 0.0.0.0)

Link ID	ADV Router	Age	Seq#	CkSum
192.88.88.27	1.1.1.1	120	0x80000001	0x5366

## Summary Link States (Area 0.0.0.0)

Link ID	ADV Router	Age	Seq#	CkSum	Route
10.0.0.0	1.1.1.1	2	0x80000003	0x350d	10.0.0.0/24
100.0.0.0	1.1.1.1	2	0x8000000c	0x1ecb	100.0.0.0/16

## Router Link States (Area 0.0.0.1 [NSSA])

Link ID	ADV Router	Age	Seq#	CkSum	Link count
1.1.1.1	1.1.1.1	2	0x80000001	0x91a2	1

## Summary Link States (Area 0.0.0.1 [NSSA])

Link ID	ADV Router	Age	Seq#	CkSum	Route
100.0.0.0	1.1.1.1	2	0x80000001	0x52a4	100.0.0.0/16
192.88.88.0	1.1.1.1	2	0x80000001	0xbb2d	192.88.88.0/24

## NSSA-external Link States (Area 0.0.0.1 [NSSA])

Link ID	ADV Router	Age	Seq#	CkSum	Route	Tag
20.0.0.0	1.1.1.1	1	0x80000001	0x033c	E2 20.0.0.0/24	0
100.0.0.0	1.1.1.1	1	0x80000001	0x9469	E2 100.0.0.0/28	0

## AS External Link States

Link ID	ADV Router	Age	Seq#	CkSum	Route	Tag
20.0.0.0	1.1.1.1	380	0x8000000a	0x7627	E2 20.0.0.0/24	0
100.0.0.0	1.1.1.1	620	0x8000000a	0x0854	E2 100.0.0.0/28	0

**show ip ospf database**

Link ID	
ADV Router	
Age	
Seq#	LSA
Cksum	
Link-Count	
Route	LSA
Tag	

2            **show ip ospf database asbr-summary**

Ruijie# **show ip ospf database asbr-summary**

OSPF Router with ID (1.1.1.35) (Process ID 1)

ASBR-Summary Link States (Area 0.0.0.1)

LS age: 47

Length	
Network Mask	
TOS	TOS 0
Metric	

**3 show ip ospf database external**

```
Ruijie# show ip ospf database external
OSPF Router with ID (1.1.1.35) (Process ID 1)
AS External Link States
LS age: 752
Options: 0x2 (*|---|E|)
LS Type: AS-external-LSA
Link State ID: 20.0.0.0 (External Network Number)
Advertising Router: 1.1.1.1
LS Seq Number: 8000000a
Checksum: 0x7627
Length: 36
```

## OSPF

---

Network Mask	
Metric Type	
TOS	
Metric	
Forward Address	0.0.0.0 IP
External Route Tag	32 OSPF

### 4 show ip ospf database network

```
Ruijie# show ip ospf database network
OSPF Router with ID (1.1.1.1) (Process ID 1)
Network Link States (Area 0.0.0.0)
```

Checksum	
Length	
Network Mask	
Attached Router	

**5 show ip ospf database router**

```
Ruijie# show ip ospf database router
OSPF Router with ID (1.1.1.1) (Process ID 1)
Router Link States (Area 0.0.0.0)
LS age: 322
Options: 0x2 (*|---|---|E|)
Flags: 0x3 : ABR ASBR
LS Type: router-LSA
Link State ID: 1.1.1.1
Advertising Router: 1.1.1.1
LS Seq Number: 80000012
Checksum: 0x6d3a
Length: 48
Number of Links: 2
Link connected to: Stub Network
(Link ID) Network/subnet number: 100.0.1.1
(Link Data) Network Mask: 255.255.255.255
Number of TOS metrics: 0
TOS 0 Metric: 0
```

**show ip ospf database router**

	OSPF
OSPF Router with ID	
Router Link States	
LS age	
Options	
Flag	router
LS Type	
Link State ID	
Advertising Router	
LS Seq Number	
Checksum	

---

Length

Number of Links

TOS	TOS	0
Metric		

**7 show ip ospf database nssa-external**

```
Ruijie# show ip ospf database nssa-external
OSPF Router with ID (1.1.1.1) (Process ID 1)
NSSA-external Link States (Area 0.0.0.1 [NSSA])
LS age: 1
Options: 0x0 (*|---|---|---|)
LS Type: AS-NSSA-LSA
Link State ID: 20.0.0.0 (External Network Number For NSSA)
Advertising Router: 1.1.1.1
LS Seq Number: 80000001
Checksum: 0x033c
Length: 36
Network Mask: /24
Metric Type: 2 (Larger than any link state path)
TOS: 0
Metric: 20
NSSA: Forward Address: 100.0.2.1
External Route Tag: 0
```

**show ip ospf database nssa-external**

OSPF Router with ID	OSPF
NSSA-external Link States	
LS age	
Options	
LS Type	
Link State ID	
Advertising Router	
LS Seq Number	
Checksum	
Length	
Network Mask	
Metric Type	

TOS	TOS	0
Metric		
NSSA:Forward Address	0.0.0.0	IP
External Route Tag	OSPF	32
	OSPF	

**8 show ip ospf database external**

```
Ruijie# show ip ospf database external
OSPF Router with ID (1.1.1.1) (Process ID 1)
AS External Link States
LS age: 1290
Options: 0x2 (*|---|E|)
LS Type: AS-external-LSA
Link State ID: 20.0.0.0 (External Network Number)
Advertising Router: 1.1.1.1
LS Seq Number: 8000000a
Checksum: 0x7627
Length: 36
Network Mask: /24
Metric Type: 2 (Larger than any link state path)
TOS: 0
Metric: 20
Forward Address: 0.0.0.0
External Route Tag: 0
```

**show ip ospf database external**

OSPF Router with ID	OSPF
Type-7 AS External Link States	
LS age	
Options	
LS Type	
Link State ID	
Advertising Router	

**OSPF**

---

LS Seq Number	
Checksum	
Length	
Network Mask	

|

|

-	-

### 36.2.4 show ip ospf interface

OSPF

**show ip ospf interface**

**show ip ospf interface** [*interface-type interface-number*]

|

<i>interface-type</i>	

' *interface-number*

BFD :

```
Ruijie# show ip ospf interface fa 1/0
FastEthernet 1/0 is up, line protocol is up
Internet Address 192.88.88.27/24, Ifindex 4, Area 0.0.0.0, MTU 1500
Matching network config: 192.88.88.0/24
Process ID 1, Router ID 1.1.1.1, Network Type BROADCAST, Cost: 1
Transmit Delay is 1 sec, State DR, Priority 1, BFD enabled
Designated Router (ID) 1.1.1.1, Interface Address 192.88.88.27
Backup Designated Router (ID) 3.3.3.3, Interface Address
192.88.88.72
Timer intervals configured,Hello 10,Dead 40,Wait 40,Retransmit 5
Hello due in 00:00:03
Neighbor Count is 1, Adjacent neighbor count is 1
Crypt Sequence Number is 70784
Hello received 1786 sent 1787, DD received 13 sent 8
LS-Req received 2 sent 2, LS-Upd received 29 sent 53
LS-Ack received 46 sent 23, Discarded 1
```

**show ip ospf interface serial 1/0**

	UP	Down
FastEthernet 0/0 State		
Internet Address	IP	
Area	OSPF	
MTU	MTU	
Matching network config	OSPF	network area
Process ID		
Router ID	OSPF	
Network Type	OSPF	
Cost	OSPF	
Transmit Delay is	OSPF	
State	DR/BDR	
Priority		
Designated Router(ID)	DR	
DR's Interface address	DR	

Backup designated router(ID)	BDR
BDR's Interface address	BDR
Time intervals configured	Hello Dead Wait Retransmit
Hello due in	HELLO
Neighbor count	
Adjacent neighbor count	Full
Crypt Sequence Number	md5
Hello received send	HELLO
DD received send	DD
LS-Req received send	LS
LS-Upd received send	LS
LS-Ack received send	LS
Discard	OSPF

-	-

-	-

### 36.2.5 show ip ospf neighbor

OSPF

**show ip ospf neighbor**

**show ip ospf** [*process-id*] **neighbor** [[*detail*] | [[*interface-type*  
*interface-number*] [*neighbor-id*]]]

--	--

## OSPF

**show ip ospf neighbor**

```
Ruijie# show ip ospf neighbor
```

```
OSPF process 1, 1 Neighbors, 1 is Full:
```

Neighbor ID	Pri	State	Dead Time	Address	Interface
3.3.3.3	1	Full/BDR	00:00:32	192.88.88.72	FastEthernet 1/0

```
Ruijie# show ip ospf neighbor detail
```

```
Neighbor 3.3.3.3, interface address 192.88.88.72
```

```
In the area 0.0.0.0 via interface FastEthernet 1/0
```

```
Neighbor priority is 1, State is Full, 11 state changes
```

```
DR is 192.88.88.27, BDR is 192.88.88.72
```

```
Options is 0x52 (*|O|-|EA|-|-|E|-)
```

```
Dead timer due in 00:00:32
```

```
Neighbor is up for 05:11:27
```

```
Database Summary List 0
```

```
Link State Request List 0
```

```
Link State Retransmission List 0
```

```
Crypt Sequence Number is 0
```

```
Thread Inactivity Timer on
```

```
Thread Database Description Retransmission off
```

```
Thread Link State Request Retransmission off
```

```
Thread Link State Update Retransmission off
```

```
Thread Poll Timer on
```

```
Graceful-restart helper disabled
```

```
BFD
```

```
" BFD session state up"
```

```
Ruijie# show ip ospf neighbor
```

```
OSPF process 1, 1 Neighbors, 1 is Full:
```

Neighbor ID	Pri	State	Dead Time	Address	Interface
3.3.3.3	1	Full/BDR	00:00:32	192.88.88.72	FastEthernet 1/0

```
Ruijie# show ip ospf neighbor detail
```

```
Neighbor 3.3.3.3, interface address 192.88.88.72
```

```
In the area 0.0.0.0 via interface FastEthernet 1/0
```

```
Neighbor priority is 1, State is Full, 11 state changes
```

```
DR is 192.88.88.27, BDR is 192.88.88.72
Options is 0x52 (*|O|-|EA|-|-|E|-)
Dead timer due in 00:00:32
Neighbor is up for 05:11:27
Database Summary List 0
Link State Request List 0
Link State Retransmission List 0
Crypt Sequence Number is 0
Thread Inactivity Timer on
Thread Database Description Retransmission off
Thread Link State Request Retransmission off
Thread Link State Update Retransmission off
Thread Poll Timer on
Graceful-restart helper disabled
BFD session state up
```

**show ip ospf neighbor**

```
52.76 460.7 139.2 19.56 reTDBT/C2_BT/C2_BT/C2_etrBT2.01250.48 -20.1 re1D
```

OSPF

---

BDR	BDR	BDR	( Hello
	BDR )		
Options	Hello E	0	STUB
		STUB	

**OSPF**

<b>count</b>	<b>OSPF</b>
--------------	-------------

--

--

--

OSPF                      count                      OSPF

Ruijie# **show ip ospf route**

OSPF process 1:

Codes: C - connected, D - Discard, O - OSPF,

IA - OSPF inter area N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

E1 - OSPF external type 1, E2 - OSPF external type 2

E2 100.0.0.0/24 [1/20] via 192.88.88.126, FastEthernet 1/0

C 192.88.88.0/24 [1] is directly connected, FastEthernet 1/0, Area 0.0.0.1

**show ip ospf route**

codes	
100.0.0.0/24	
[1]	cost
via	

--	--

**show ip ospf [*process-id*] summary-address**

<i>process-id</i>	OSPF	OSPF

└───

└───

└───

NSSA ABR

**show ip ospf summary-address**

<i>process-id</i>	OSPF OSPF
<i>ip-address</i>	ID

**ospf neighbor**

**show ip**

**show ip ospf virtual-links**

```
Ruijie# show ip ospf virtual-links
Virtual Link VLINK0 to router 1.1.1.1 is up
Transit area 0.0.0.1 via interface FastEthernet 0/1
Local address 10.0.0.37/32
Remote address 10.0.0.27/32
Transmit Delay is 1 sec, State Point-To-Point,
Timer intervals configured,Hello 10,Dead 40,Wait 40,Retransmit 5
Hello due in 00:00:05
Adjacency state Full
```

Virtual Link VLINK0 to router 1.1.1.1 is up	
Transit area 0.0.0.1 via interface FastEthernet 0/1	
Local address 10.0.0.37/32	
Remote address 10.0.0.27/32	
Transmit Delay is 1 sec, State Point-To-Point,	
Timer intervals configured,Hello 10,Dead 40,Wait 40,Retransmit 5	
Hello due in 00:00:05	
Adjacency state Full	

OSPF

---

	-	-
--	---	---

	-	-

---

# 37

## 37.1

### 37.1.1 distribute-list in

#### distribute-list in

no

**distribute-list** {[*access-list-number* | *access-list-name*] | **prefix** *prefix-list-name* [**gateway** *prefix-list-name*]} **in** [*interface-type* *interface-number*]

**no distribute-list** {[*access-list-number* | *access-list-name*] | **prefix** *prefix-list-name* [**gateway** *prefix-list-name*]} **in** [*interface-type* *interface-number*]

<i>access-list-number</i>	1-99 1300-1999 100-199 2000-2699
<i>access-list-name</i>	
<b>prefix</b> <i>prefix-list-name</i>	
<b>gateway</b> <i>prefix-list-name</i>	
<i>interface-type</i> <i>interface-number</i>	( )

OSPF

OSPF

RIP Fastethernet 0/0

172.16

Ruijie(config)# **router rip**

Ruijie(config-router)# **network 200.168.23.0**

```

Ruijie(config-router)# distribute-list 10 in fastethernet 0/0
Ruijie(config-router)# no auto-summary
Ruijie(config-router)# exit
Ruijie(config)# access-list 10 permit 172.16.0.0 0.0.255.255

```

<b>access-list</b>	
<b>prefix-list</b>	

-	-

### 37.1.2 distribute-list out

#### distribute-list out

**no**

**distribute-list** {[*access-list-number* | *access-list-name*] | **prefix** *prefix-list-name*} **out** [*interface* | *protocol* | *process-id*]

**no distribute-list** {[*access-list-number* | *name*] | **prefix** *prefix-list-name*} **out** [*interface* | *protocol* | *process-id*]

<i>access-list-number</i>	1-99 1300-1999 100-199 2000-2699
<i>access-list-name</i>	
<b>prefix</b> <i>prefix-list-name</i>	
<i>Interface</i>	( )
<i>protocol</i>	( )

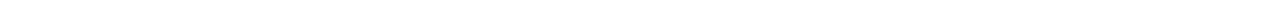
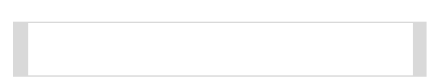
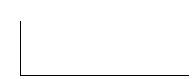
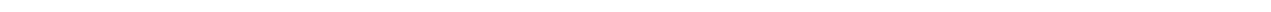


<i>community-list-name</i>	80
<i>community-list-number</i>	1-99 100-199
<b>permit</b>	
<b>deny</b>	
<i>community-number</i>	AA:NN( 2 ) 0-4294967295 internet Internet local-as AS no-advertise BGP peers no-export EBGPeers 1..255 32

BGP

```
Ruijie(config)# ip community-list standard test deny 100:20 200:20
Ruijie(config)# ip community-list standard test2 permit internet
```

<b>match community</b>	
<b>set comm-list delete</b>	BGP
<b>show ip community-list</b>	
<b>show ip bgp community-list</b>	BGP



-	-

### 37.1.5 ip prefix-list

**ip prefix-list**                      **no**

**ip prefix-list** *prefix-lis-name* [ **seq** *seq-number*] { **deny** | **permit** } *ip-prefix* [**ge** *minimum-prefix-length*][**le** *maximum-prefix-length*]

**no ip prefix-list** *prefix-lis-name*[ **seq** *seq-number*] { **deny** | **permit**} *ip-prefix* [**ge** *minimum-prefix-length*][**le** *maximum-prefix-length*]

<i>prefix-lis-name</i>	
<i>seq-number</i>	1 2147483647 5
<b>deny</b>	
<b>permit</b>	
<i>ip-prefix</i>	IP                      0    32
<i>minimum-prefix-length</i>	(                      ) <b>ge</b>
<i>maximum-prefix-length</i>	(                      ) <b>le</b>

**ip prefix-list**                      IP                      permit                      deny

```

ge          minimum-prefix-length 32          le          ip-prefix
           maximum-prefix-length
minimum-prefix-length maximum-prefix-length ip-prefix
minimum-prefix-length maximum-prefix-length ip-prefix <
minimum-prefix-length < maximum-prefix-length <= 32

```

```

           IP          OSPF          RIP
           IP          IP          (
IP 201.1.1.0/24          )
Ruijie# configure terminal
Ruijie(config)# ip prefix-list pre1 permit 201.1.1.0/24
Ruijie(config)# router ospf
Ruijie(config-router)# distribute-list prefix pre1 out rip
Ruijie(config-router)# end

```

--	-

-	-

### 37.1.6 ip prefix-list description

**ip prefix-list description no**

**ip prefix-list** *prefix-lis-name* **description** *descripton-text*

<i>prefix-lis-name</i>	
<i>descripton-text</i>	



---

	-	-

37.1.8 ip ref ecmp load-balance

S5760

**ip ref ecmp load-balance { src-dst-mac | ip }**

**no ip ref ecmp load-balance { src-dst-mac | ip }**

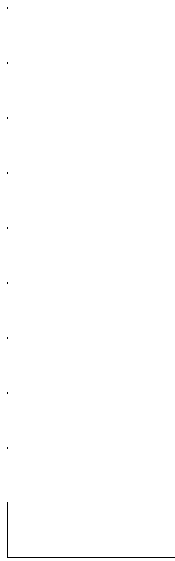
--	--



---

---

### 37.1.9 ip route



---

---

---

---

---

---

---

---

---

---

---



ip route 0.0.0.0

RP

CPU

```
192.168.12.1          172.16.100.0/24
                    115
ip route 172.16.100.0 255.255.255.0 192.168.12.1 115
```

```
fastethernet 0/0
Ruijie(config)# ip route 172.16.100.0 255.255.255.0 fastethernet
0/0 192.168.12.1
```

<b>show ip route</b>	IP

--	--

-

-

RGOS IP

RGOS IP

Ruijie(config)# no ip routing

-	-

-	-

### 37.1.11 ip static route-limit

**ip static route-limit** no

**ip static route-limit** *number*

**no ip static route-limit**

<i>number</i>	1-10000

1024

**ip static route-limit**

**show**

**running-config**

900

Ruijie(config)# **ip static route-limit 900**

Ruijie(config)# **no ip static route-limit**

-	-

---

```

                                ge      le
                                ipv6-prefix
      ge      le      ipv6-prefix
      ipv6-prefix      minimum-prefix-length 32      le
      minimum-prefix-length      maximum-prefix-length
      minimum-prefix-length      maximum-prefix-length      ipv6-prefix
      minimum-prefix-length < maximum-prefix-length      ipv6-prefix      <
      minimum-prefix-length < maximum-prefix-length <= 128

```

```

                                RIP      OSPF      1
                                IP      IPv6      (
      IP 2222::/64      )
Ruijie# configure terminal
Ruijie(config)# ipv6 prefix-list pre permit 2222::/64
Ruijie(config)# ipv6 router rip
Ruijie(config-router)# redistribute ospf 1
Ruijie(config-router)# distribute-list prefix pre out
Ruijie(config-router)# end

```

-	-

--	--

IPv6

pre

Deny routes from Net-A

Ruijie# **configure terminal**

Ruijie(config)# **ipv6 prefix-list pre description Deny routes from  
Net-A**

-	-

-	

---

	-	-

---

--	--	--

---

1::/64 2002::2 115

1::/64

fastEthernet 0/0

1::/64 fastEthernet 0/0 2002::2

---

--	--

IPv6

---

<b>ipv6 route</b>	ipv6
<b>show ipv6 route</b>	IPv6

!



---

**37.1.19 match community**

---

<b>match origin</b>	
<b>set as-path prepend</b>	AS_PATH
<b>set comm-list delete</b>	
<b>set community</b>	
<b>set metric</b>	

└──

-	-

### 37.1.20 match interface

**match interface**                    **no**

**match interface** *interface-type interface-number [...interface-type interface-number]*

**no match interface** *interface-type interface-number [...interface-type interface-number]*

<i>interface-type</i>	
<i>interface-number</i>	

└──

└──

**match interface**

```

                                OSPF                RIP                fastethernet
0/0  RIP
Ruijie(config)# router ospf
Ruijie(config-router)# redistribute rip subnets route-map redrip
Ruijie(config-router)# network 192.168.12.0 0.0.0.255 area 0
Ruijie(config-router)# exit
Ruijie(config)# route-map redrip permit 10
Ruijie(config-route-map)# match interface fastethernet 0/0

```

<b>match ip address</b>	
<b>match ip next-hop</b>	
<b>match ip route-source</b>	
<b>match metric</b>	
<b>match route-type</b>	
<b>match tag</b>	
<b>set metric</b>	
<b>set metric-type</b>	
<b>set tag</b>	

-	-

### 37.1.21 match ip address

```

                                match ip
address                no
match ip address {access-list-number [access-list-number... |access-list-name...]
|access-list-name [access-list-number...|access-list-name] | prefix-list prefix-list-name
[prefix-list-name...]}
```

```

no match ip address {access-list-number [access-list-number... | access-list-name...] |
access-list-name [access-list-number...| access-list-name] | prefix-list prefix-list-name
[prefix-list-name...]}
```

---

<i>access-list-number</i>	1-99 1300-1999 100-199 2000-2699
<i>access-list-name</i>	
<b>prefix-list</b> <i>prefix-list-name</i>	

|  
 |  
 |

**match ip address**

RIP

RIP

OSPF

---

<b>match ip next-hop</b>	
<b>match ip route-source</b>	
<b>match metric</b>	
<b>match route-type</b>	
<b>match tag</b>	
<b>set metric</b>	
<b>set metric-type</b>	
<b>set tag</b>	

---

**match ip next-hop**

RIP

RIP  
IP

route maps

1

**match**

**sc**

OSPF

RIP

10 20 OSPF

Ruijie(config)# **router ospf**

Ruijie(config-router)# **redistribute**

Ruijie(config-router)# **network 192.1**

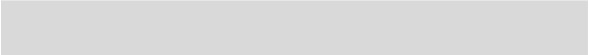
Ruijie(config-router)# **exit**

Ruijie(config)# **access-list 10 permi**

Ruijie(config)# **access-list 20 permi**

Ruijie(config)# **route-map redrip per**

Ruijie(config-route-map)# **match ip next-hop 10 20**



### 37.1.23 match ip route-source

IP

**match ip route-source** **no**

**match ip route-source** {*access-list-number* [*access-list-number...* | *access-list-name...*] | *access-list-name* [*access-list-number...* | *access-list-name*] | **prefix-list** *prefix-list-name* [*prefix-list-name...*]}

**no match ip route-source** {*access-list-number* [*access-list-number...* | *access-list-name...*] | *access-list-name* [*access-list-number...* | *access-list-name*] | **prefix-list** *prefix-list-name* [*prefix-list-name...*]}

<i>access-list-number</i>	
<i>access-list-name</i>	
<b>prefix-list</b> <i>prefix-list-name</i>	

**match ip route-source**

```

                                OSPF
                                RIP          RIP
                                OSPF      IP
                                route maps
                                1          match   1          set
                                match      set

```

```

                                OSPF          RIP          RIP          IP
                                5 OSPF
Ruijie(config)# router ospf
Ruijie(config-router)# redistribute rip subnets
Ruijie(config-router)# route-map redrip
Ruijie(config-router)# network 192.168.12.0 0.0.0.255 area 0
Ruijie(config-router)# exit
Ruijie(config)# access-list 5 permit host 192.168.100.1
Ruijie(config)# route-map redrip permit 10
Ruijie(config-route-map)# match ip route-source 5

```

---

<b>access-list</b>	
<b>match ip address</b>	
<b>match interface</b>	
<b>match ip next-hop</b>	

**match route-t}T1 1 Tf**



<b>match ipv6 route-source</b>	IPv6
<b>match metric</b>	
<b>match route-type</b>	
<b>match tag</b>	
<b>set metric</b>	
<b>set metric-type</b>	
<b>set tag</b>	
<b>set ipv6 default next-hop</b>	
<b>set ipv6 next-hop</b>	
<b>show ipv6 policy</b>	

-	-

### 37.1.25 match ipv6 next-hop

IPv6  
**match ipv6 address**                      **no**

**match ipv6 next-hop** { *access-list-name* | **prefix-list** *prefix-list-name* }

**no match ipv6 next-hop**

<i>access-list-name</i>	
<b>prefix-list</b> <i>prefix-list-name</i>	IPv6



OSPF

RIP                                  RIP

OSPF                                  IP

route maps

	1	<b>match</b>	1	<b>set</b>
<b>match</b>		<b>set</b>		

```

RIP          OSPF          RIP          10
RIP          OSPF          type-1      40
Ruijie(config)# ipv6 router ospf
Ruijie(config-router)# redistribute rip subnets route-map redrip
Ruijie(config-router)# exit
Ruijie(config)# ipv6 access-list v6acl
Ruijie(config-ipv6-acl)# 10 permit ipv6 2720::/64 any
Ruijie(config-ipv6-acl)# exit
Ruijie(config)# route-map redrip permit 10
Ruijie(config-route-map)# match ipv6 next-hop v6acl
Ruijie(config-route-map)# set metric 40

```

ipv6 access-list	IPv6
------------------	------

---

IPv6  
**match ipv6 address**            **no**  
**match ipv6 route-source** { *access-list-name* | **prefix-list** *prefix-list-name* }  
**no match ipv6 route-source**

<i>access-list-name</i>	
<b>prefix-list</b> <i>prefix-list-name</i>	IPv6

└─

└─

└─

```

                                OSPF
                                RIP      RIP      OSPF
                                |      |      |
                                OSPF  IP
                                |
                                route maps
                                |
                                1      match   1      set
                                match   set

```

<b>match ipv6 address</b>	IPv6
<b>match ipv6 route-source</b>	IPv6
<b>match metric</b>	
<b>match route-type</b>	
<b>match tag</b>	
<b>set metric</b>	
<b>set metric-type</b>	
<b>set tag</b>	

-	-

### 37.1.27 match length

no                      IP    match length

---

<i>metric</i>	0-4294967295
---------------	--------------

└──

└──

└──

```

                                OSPF
                                RIP
                                RIP
                                IP
                                route maps
                                1
                                match
                                set
                                1
                                set
                                match
                                OSPF
                                RIP
                                10
                                RIP
                                OSPF

```

```

Ruijie(config)# router ospf
Ruijie(config-router)# redistribute rip subnets route-map
redist-rip
Ruijie(config-router)# network 192.168.12.0 0.0.0.255 area 0
Ruijie(config-router)# exit
Ruijie(config)# route-map redist-rip permit 10
Ruijie(config-route-map)# match metric 10 Ruijie(config-route-map)#

```

-	-

### 37.1.29 match origin

#### match origin

no

match origin {egp | igp | incomplete}

no match origin {egp | igp | incomplete}

<b>egp</b>	EGP
<b>igp</b>	IGP
<b>Incomplete</b>	

┌

┌

┌

```
Ruijie(config)# route-map MY_MAP 10 permit
Ruijie(config-route-map)# match origin egp
Ruijie(config-route-map)# set community 109
Ruijie(config-route-map)# exit
Ruijie(config)# route-map MAP20 20 permit
Ruijie(config-route-map)# match origin incomplete
Ruijie(config-route-map)# set community no-export
```

<b>match as-path</b>	AS_PATH
<b>match metric</b>	
<b>match origin</b>	

<b>set as-path prepend</b>	AS_PATH
<b>set metric</b>	
<b>set origin</b>	

-	-
---	---

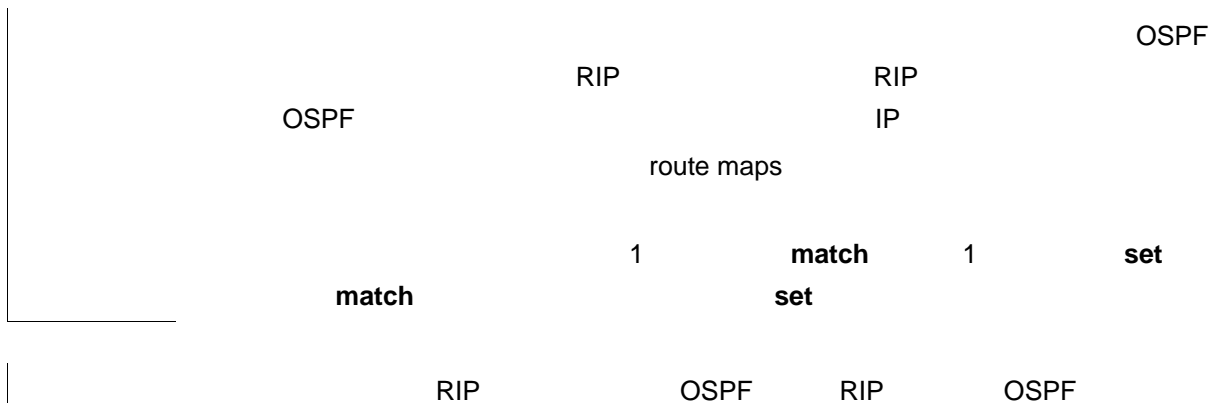
### 37.1.30 match route-type

**match route-type**      **no**

**match route-type** {local | internal | external [type-1 | type-2] | level-1 | level-2}

**no match route-type** {local | internal | external [type-1 | type-2] | level-1 | level-2}

<b>local</b>	
<b>Internal</b>	OSPF
<b>external</b>	(BGP OSPF )
<b>type-1   type-2</b>	OSPF 1 2
<b>level-1   level-2</b>	ISIS 1 2



```

Ruijie(config)# router rip
Ruijie(config-router)# redistribute ospf route-map redrip
Ruijie(config-router)# network 192.168.12.0
Ruijie(config-router)# exit
Ruijie(config)# route-map redrip permit 10
Ruijie(config-route-map)# match route-type internal

```

<b>access-list</b>	
<b>match ip address</b>	
<b>match interface</b>	
<b>match ip next-hop</b>	
<b>match ip route-source</b>	
<b>match metric</b>	
<b>match tag</b>	
<b>set metric</b>	
<b>set metric-type</b>	
<b>set tag</b>	

-	-

### 37.1.31 match tag

**match tag**      **no**

**match tag** *tag* [...*tag*]

**no match tag** *tag* [...*tag*]

<i>tag</i>	

```

match tag          tag
                    RIP          OSPF
                    RIP          OSPF
                    IP
                    route maps
                    1          match 1          set
                    match      set

```

```

                    RIP          OSPF  RIP          OSPF
50 80
Ruijie(config)# router rip
Ruijie(config-router)# redistribute ospf 100 route-map redrip
Ruijie(config-router)# network 192.168.12.0
Ruijie(config-router)# exit
Ruijie(config)# route-map redrip permit 10
Ruijie(config-route-map)# match tag 50 80

```

<b>access-list</b>	
<b>match ip address</b>	
<b>match interface</b>	
<b>match ip route-source</b>	
<b>match metric</b>	
<b>match ip next-hop</b>	
<b>match route-type</b>	
<b>set metric</b>	
<b>set metric-type</b>	
<b>set tag</b>	

-	-

### 37.1.32 maximum-paths

---

**maximum-paths**

no

**maximum-paths** *number*

**no maximum-paths**

<i>route-map-name</i>	
<b>permit</b>	permit match set set permit match set
<b>deny</b>	deny match deny match set
<i>sequence-number</i>	

└──  
└──

```

RGIOS
      OSPF
        RIP
          route maps
            1 match 1 set
            set
            sequence-number 10
            sequence-number
            >
            >
            >

```

```

                OSPF                RIP                4  RIP
                OSPF                type-1            40
                40

```

```

Ruijie(config)# router ospf
Ruijie(config-router)# redistribute rip subnets route-map redrip
Ruijie(config-router)# network 192.168.12.0 0.0.0.255 area 0
Ruijie(config-router)# exit
Ruijie(config)# route-map redrip permit 10
Ruijie(config-route-map)# match metric 4
Ruijie(config-route-map)# set metric 40
Ruijie(config-route-map)# set metric-type type-1
Ruijie(config-route-map)# set tag 40

```

<b>Redistribute</b>	

-	-

### 37.1.34 set aggregator as

```

                match                AS                set
aggregator as                no
set aggregator as as-num ip_addr

```

BGP

as,ip-addr

```
Ruijie(config)# route-map set-as-path  
Ruijie(config-route-map)# match as-path 1  
Ruijie(config-route-map)# set aggregator as 3 2.2.2.2
```

match as-path	AS_PATH
match community	
match metric	
match origin	
set community	COMMUNITY
set metric	
set metric-type	

-	-

### 37.1.35 set as-path prepend

match AS\_PATH set  
as-path prepend no  
set as-path prepend *as-number*  
no set as-path prepend [*as-number*]

<i>as-number</i>	AS_PATH AS

AS\_PATH

as-path

15 as

```
Ruijie(config)# route-map set-as-path  
Ruijie(config-route-map)# match as-path 1  
Ruijie(config-route-map)# set as-path prepend 100 101 102
```

match as-path	AS_PATH
match community	
match metric	
match origin	
set community	COMMUNITY
set metric	
set metric-type	

-	-

### 37.1.36 set comm-list delete

match                    COMMUNITY\_LIST                    community  
**set comm-list delete                    no**

**set comm-list** *community-list-number* | *community-list-name* **delete**

**no comm-list** *community-list-number* | *community-list-name* **delete**

<i>community-list-number</i>	1-99 100-199
<i>community-list-name</i>	80

```

Ruijie(config)# router bgp 100
Ruijie(config-router)# neighbor 172.16.233.33 remote-as 120
Ruijie(config-router)# neighbor 172.16.233.33 route-map ROUTEMAPIN
in
Ruijie(config-router)# neighbor 172.16.233.33 route-map
ROUTEMAPOUT out
Ruijie(config-router)# exit
Ruijie(config)# ip community-list 500 permit 100:10
Ruijie(config)# ip community-list 500 permit 100:20
Ruijie(config)# ip community-list 120 deny 100:50
Ruijie(config)# ip community-list 120 permit 100:.*
Ruijie(config)# route-map ROUTEMAPIN permit 10
Ruijie(config-route-map)# set comm-list 500 delete
Ruijie(config-route-map)# exit
Ruijie(config)# route-map ROUTEMAPOUT permit 10
Ruijie(config-route-map)# set comm-list 120 delete

```

<b>ip community-list</b>	
<b>match as-path</b>	AS_PATH
<b>match community</b>	
<b>match metric</b>	
<b>match origin</b>	
<b>set as-path prepend</b>	AS_PATH
<b>set comm-list delete</b>	
<b>set local-preference</b>	

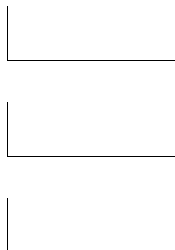
### 37.1.37 set community

```

match COMMUNITY set
community no
set community {community-number[community-number ...] additive | none}
no set community { community-number[community-number ...] additive | none}

```

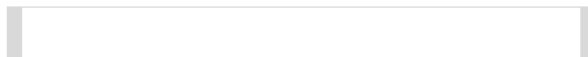
<i>community-number</i>	AA:NN( :2 ) 0-4294967295 internet Internet
	local-as AS
	no-advertise BGP peers
	no-export EBGPeers
<b>additive</b>	community
<b>none</b>	



```

Ruijie(config)# route-map SET_COMMUNITY 10 permit
Ruijie(config-route-map)# match as-path 1
Ruijie(config-route-map)# set community 109:10
Ruijie(config-route-map)# exit
Ruijie(config)# route-map SET_COMMUNITY 20 permit
Ruijie(config-route-map)# match as-path 2
Ruijie(config-route-map)# set community no-export

```



---

**match community**

---

*g in*



---

---

---

---

---

---

---

---



```

Ruijie(config)# access-list 2 permit 192.168.78.0 255.255.255.0
Ruijie(config)# route-map MAP_NAME permit 10
Ruijie(config-route-map)# match ip-address 2
Ruijie(config-route-map)# set extcommunity rt 100:2

```

<b>match as-path</b>	AS_PATH
<b>match community</b>	
<b>match metric</b>	
<b>match origin</b>	
<b>set as-path prepend</b>	AS_PATH
<b>set metric</b>	
<b>set metric-type</b>	

-	-

### 37.1.40 set ip dscp

```

match DSCP set ip dscp
no
set ip dscp dscp_value
no set ip dscp

```

<i>dscp_value</i>	IP IP DSCP

L

L

|

--	--

<b>route-map</b>	
------------------	--

<b>match ip address</b>	
-------------------------	--

<b>set default interface</b>	
------------------------------	--

---

<b>set</b>	WCMP	weight	WCMP	WCMP
<b>set ip next-hop</b>	IP	32		
ip address	weight	4	nexthop	
	next-hop	weight	<b>set</b>	
<b>r</b>	WCMP	weight	WCMP	weight
		weight	nexthop	
	1			

---

set default interface	
set default interface	
set interface	
set ip default next-hop	IP
set ip precedence	IP

-	-

### 37.1.42 set ip next-hop verify-availability

verify-availability
IP
set ip next-hop

```

Ruijie(config)#access-list 20 permit 172.16.0.0 0.0.255.255
Ruijie(config)#route-map load-balance permit 10
Ruijie(config-route-map)#match ip address 10
Ruijie(config-route-map)#set ip next-hop 192.168.100.1
Ruijie(config)#route-map load-balance permit 20
Ruijie(config--route-map)#match ip address 20
Ruijie(config-route-map)#set ip next-hop 172.16.100.1
Ruijie(config)#route-map load-balance permit 30
Ruijie(config-route-map)#set interface Null 0

```

<b>route-map</b>	
<b>match ip address</b>	
<b>set default interface</b>	

**set default interface**

RuijieEE4 r4 0.48 ref66.84 492.1

---

	-	-
--	---	---

---

---

### 37.1.44 set ip tos

match IP TOS, set ip tos  
no tos

**set ip tos** {<0-15> | *max-reliability* | *max-throughput* | *min-delay* | *min-monetary-cost* | *normal*}

**no set ip tos** {<0-15> | *max-reliability* | *max-throughput* | *min-delay* | *min-monetary-cost* | *normal*}

-	-

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IP TOS IP  
IP TOS

```

fastEthernet 0/0 192.168.217.68
tos 4
Ruijie(config)#access-list 1 permit 192.168.217.68 0.0.0.0
Ruijie(config)#route-map name
Ruijie(config-route-map)#match ip address 1
Ruijie(config-route-map)#set ip tos 4
Ruijie(config)#interface FastEthernet 0/0
Ruijie(config-if)#ip policy route-map name

```

match interface	
match ip address	
match ip next-hop	
match ip route-source	
match metric	
match route-type	



```

#                               BFD           BFD           2002::2
Ruijie#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Ruijie(config)# route-map Example1 permit 10
Ruijie(config-route-map)# match ipv6 address 1
Ruijie(config-route-map)# set ipv6 precedence priority
Ruijie(config-route-map)# set ipv6 next-hop 2002::2
Ruijie(config-route-map)#set ipv6 next-hop verify-availability
2002::2 bfd FastEthernet 0/1 2002::2
Ruijie(config-route-map)#end

```

<b>bfd</b>	BFD

<b>10.4</b>	

### 37.1.46 set level

match set level  
no

**set level {level 1 | level 2 | level 1-2 | stub-area | backbone}**

**no set level**

-	-



local-preference

local-preference

```
Ruijie(config)# route-map SET_PREF permit 10
Ruijie(config-route-map)# match as-path 1
Ruijie(config-route-map)# set local-preference 6800
Ruijie(config-route-map)# exit
Ruijie(config)# route-map SET_PREF permit 20
Ruijie(config-route-map)# match as-path 2
Ruijie(config-route-map)# set local-preference 50
```

match as-path	AS_PATH
match metric	
match origin	
set as-path prepend	AS_PATH
set metric	
set metric-type	

-	-

### 37.1.48 set metric

match

set metric

no

**set metric** [+ *metric-value* | - *metric-value* | *metric-value*]

no set metric

--	--

+	metric
-	metric
<i>metric-value</i>	

```

set metric + - metric
RIP metric 1-16 OSPF
OSPF RIP RIP IP
route maps
match 1 match 1 set
set

```

```

40 OSPF RIP
Ruijie(config)# router ospf
Ruijie(config-router)# redistribute rip subnets route-map redrip
Ruijie(config-router)# network 192.168.12.0 0.0.0.255 area 0
Ruijie(config-router)# exit
Ruijie(config)# route-map redrip permit 10
Ruijie(config-route-map)# set metric 40

```

<b>match interface</b>	
<b>match ip address</b>	
<b>match ip next-hop</b>	
<b>match ip route-source</b>	
<b>match metric</b>	
<b>match route-type</b>	
<b>match tag</b>	
<b>set metric-type</b>	



<b>match interface</b>	
<b>match ip address</b>	
<b>match ip next-hop</b>	
<b>match ip route-source</b>	
<b>match metric</b>	
<b>match route-type</b>	
<b>match tag</b>	
<b>set metric</b>	
<b>set tag</b>	

-	-

### 37.1.50 set next-hop

**match** IP **set next-hop**  
**no**  
**set next-hop** *ip-address*  
**no set next-hop** *ip-address*

<i>ip-address</i>	IP

OSPF RIP OSPF  
 OSPF RIP IP  
 route maps  
 match 1 match 1 set  
 match set

192.168.1.2

```
Ruijie(config)# route-map redrip permit 10
Ruijie(config-route-map)# match ip address 1
Ruijie(config-route-map)# set next-hop 192.168.1.2
```

match interface	p
match ip address	p
match ip next-hop	p
match ip route-source	p
match metric	p
match route-type	p
match tag	p
set metric-type	
set tag	

-	-

### 37.1.51 set origin

p match  
no

set origin

set origin {egp | igp | incomplete}

no set origin

egp	EGP
igp	IGP
incomplete	



```

Ruijie(config)# route-map SET_ORIGIN 10 permit
Ruijie(config-route-map)# match as-path 1
Ruijie(config-route-map)# set originator-id 5.5.5.5
Ruijie(config-route-map)# exit
Ruijie(config)# route-map SET_ORIGIN 20 permit
Ruijie(config-route-map)# match as-path 2
Ruijie(config-route-map)# set originator-id 5.5.5.6

```

<b>match as-path</b>	AS_PATH
<b>match metric</b>	
<b>match origin</b>	
<b>set as-path prepend</b>	AS_PATH
<b>set metric</b>	
<b>set local-preference</b>	

--	--

---

└──

└──

```
                                OSPF                RIP                100
Ruijie(config)# router ospf
Ruijie(config-router)# redistribute rip subnets route-map redrip
Ruijie(config-router)# network 192.168.12.0 0.0.0.255 area 0
Ruijie(config-router)# exit
Ruijie(config)# route-map redrip permit 10
Ruijie(config-route-map)# set tag 100
```

<b>match interface</b>	
<b>match ip address</b>	
<b>match ip next-hop</b>	
<b>match ip route-source</b>	
<b>match metric</b>	
<b>match route-type</b>	
<b>match tag</b>	
<b>set metric</b>	
<b>set metric-type</b>	

└──

-	-

### 37.1.54 set weight

```
                                match                BGP                set weight
no
set weight number
no set weight
```

*number*

0-65535

BGP

neighbor weight

32768

BGP

BGP in  
100

1.1.1.1

```
Ruijie(config)# router bgp 1
Ruijie(config-router)# neighbor 1.1.1.1 route-map nei-rmap-in in
Ruijie(config-router)# exit
Ruijie(config)# route-map nei-rmap-in permit 10
Ruijie(config-route-map)# set weight 100
```

<b>match as-path</b>	AS_PATH
<b>match community</b>	
<b>match metric</b>	
<b>match origin</b>	
<b>set community</b>	COMMUNITY
<b>set metric</b>	
<b>set metric-type</b>	

-	-

## 37.2

### 37.2.10 show ip community-list

show ip community-list [*community-list-number*|*community-list-name*]



--	--

### 37.2.2 show ip prefix-list

---

**show ip prefix-list**

**show ip prefix-list** [ *prefix-name* ]



---

protocol	connected, static ospf, rip bgp, isis,
----------	--

E2	E1 OSPF E2 OSPF N1 OSPF NSSA 1 N2 OSPF NSSA 2 IA OSPF su IS-IS L1 IS-IS 1 L2 IS-IS 2 ia IS-IS
20.0.0.0/8	
[1/0]	
Via 20.0.0.1	IP
00:00:06	
VLAN 1	

2 **show ip route network**

Ruijie# **show ip route 30.0.0.0**

Distance 110, metrif00

---

	-	-

### 37.2.4 show ipv6 prefix-list

IPv6	<b>show ipv6 prefix-list</b>
<b>show ipv6 prefix-list [ <i>prefix-name</i> ]</b>	
<i>prefix-name</i>	IPv6

---

**show ipv6 route** *[[network/prefix-length | summary | protocol]]*

<i>network/prefix-length</i>	
<b>summary</b>	ipv6
<b>protocol</b>	<b>connected, static</b> <b>ospf, rip</b> <b>bgp, isis,</b>

**show ipv6 route**

```
Ruijie(config)# show ipv6 route
IPv6 routing table name is Default(0) global scope - 7 entries
Codes: C - Connected, L - Local, S - Static, R - RIP, B - BGP
I1 - ISIS L1, I2 - ISIS L2, IA - ISIS interarea, IS - ISIS summary
O - OSPF intra area, OI - OSPF inter area, OE1 - OSPF external type
1, OE2 - OSPF external type 2
ON1 - OSPF NSSA external type 1, ON2 - OSPF NSSA external type 2
[*] - NOT in hardware forwarding table
L    ::1/128 via Loopback, local host
C    10::/64 via Loopback 1, directly connected
L    10::1/128 via Loopback 1, local host
```

O	C L S R RIP B BGP O OSPF i IS-IS
E2	E1 OSPF E2 OSPF N1 OSPF NSSA 1 N2 OSPF NSSA 2 IA OSPF su IS-IS L1 IS-IS 1 L2 IS-IS 2 ia IS-IS
20::/64	
[1/0]	
Via 10::4	IP
00:00:06	
VLAN 1	

ipv6 route	ipv6
------------	------

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10.1	
------	--

### 37.2.6 show route-map

---

**show route-map** *route-map-name*

<i>route-map-name</i>	

|

|

|

Ruijie# **show route-map**

route-map AAA, permit, sequence 10

Match clauses:

ip address 2

Set clauses:

metric 10

route-map	
Permit	permit
sequence 10	

Match clauses

---

## 37.3

### 37.3.1

	S5760	Ipv4	Ipv4	Ipv6	Ipv6	Ipv6
1.	Ipv4	S,G				
2.	Ipv6					
3.	Ipv6	S,G				
4.						
5.	Ipv6					
6.	Ipv6					
	Ipv4					

#### 37.3.1.1 initialization route ipv4mc

ipv4

**initialization route ipv4mc** {max\_num}

**no initialization route ipv4mc**

	<i>max_num</i>	ipv4

500

```
                ipv4                300
Ruijie(config)# initialization route ipv4mc ?
                <2-500> Max number of ipv4 multicast route entry
Ruijie(config)# initialization route ipv4mc 300
```

---

	-	-

---

--	--	--

### 37.3.1.3 initialization route ipv6uc

ipv6

**initialization route ipv6uc** {max\_num}

**no initialization route ipv6uc**

<i>max_num</i>	ipv6

0 ipv6

```

                ipv6                100
Ruijie(config)# initialization route ipv6uc ?
    <0-766> Max number of ipv6 unicast route entry
Ruijie(config)# initialization route ipv6uc 100
    
```

-	-

-	-

### 37.3.1.4 initialization route pbr

**initialization route pbr** {max\_num}

**no initialization route pbr**

<i>max_num</i>	

---

24

100

```
Ruijie(config)# initialization route pbr ?  
<0-1000> Max number of ipv4 multicast route entry  
Ruijie(config)# initialization route pbr 100
```

-	-

-	-

### 37.3.1.5 initialization route tunnel-start

ipv6

**initialization route tunnel-start** {max\_num}

**no initialization route tunnel-start**

max_num	ipv6

0 ipv6

ipv6

100

```
Ruijie(config)# initialization route tunnel-start ?  
<0-1024> Max number of tunnel start entry
```

---

```
Ruijie(config)# initialization route tunnel-start 100
```

-	-

	-	-
--	---	---

### 37.3.2

#### 37.3.2.1 show initialization route

##### show initialization route

	-	-

|  
 |  
 |  
 |

##### show initialization route

```

Ruijie# show initialization route
                                config running default
ipv4 unicast route entry:  4056  226  4096
ipv4 multicast route entry: 500   500  500
ipv6 unicast route entry:   0    766  0
ipv6 mutlicast route entry: 0     0    0
policy-based route entry:  24    24   24
tunnel termination entry:   8     8    0
tunnel start interface:   100   100  0
  
```

	-	-

|

	-	-

---

# 38

## 38.1

### 38.1.1 ip local policy route-map

ip local policy route-map

no

ip local policy route-map *route-map*

no ip local policy route-map

<i>route-map</i>	

└──┘

└──┘

x

IP

IP

1

set interface

set interface

192.168.217.10

serial 2/0

1 IP ACL

Ruijie(config)#**access-list 1 permit 192.168.217.10**

2

Ruijie(config)#**route-map lab1 permit 10**

Ruijie(config-route-map)#**match ip address 1**

Ruijie(config-route-map)#**set interface serial 2/0**

```
Ruijie(config-route-map)#exit
```

```
Ruijie(config)#ip local policy route-map lab1
```

<b>access-list</b>	
<b>route-map</b>	
<b>set vrf</b>	IP VRF
<b>set ip next-hop</b>	
<b>set ip default next-hop</b>	
<b>set interface</b>	
<b>set default interface</b>	
<b>set ip tos</b>	IP TOS
<b>set ip dscp</b>	IP DSCP
<b>set ip precedence</b>	IP
<b>match ip address</b>	
<b>match length</b>	

-	-

### 38.1.2 ip policy

---

└──

└──

**set ip next-hop**

WCMP

8

ECMP

32

ARP

ARP

MAC

MAC

nexthop,

**FastEthernet 0/0**

nexthop

1

IP

ACL config)#L access-listCL

	-	-
--	---	---

### 38.1.3 ip policy route-map

ip policy route-map no

ip policy route-map route-map

no ip policy route-map

	route-map	

┌

┌

┌

1

r

FastEthernet 0/0

10.0.0.1                      196.168.4.6                      20.0.0.1  
 196.168.5.6  
 1                      IP

```

Ruijie(config-route-map)#match ip address 2
Ruijie(config-route-map)#set ip next-hop 196.168.5.6
Ruijie(config-route-map)#exit
3
Ruijie(config)#interface FastEthernet 0/0
Ruijie(config-if)#ip policy route-map lab1
Ruijie(config-if)#exit

```

<b>access-list</b>		
<b>route-map</b>		
<b>set vrf</b>	IP	VRF
<b>set ip next-hop</b>		
<b>set ip default next-hop</b>		
<b>set interface</b>		
<b>set default interface</b>		
<b>set ip tos</b>	IP	TOS
<b>set ip dscp</b>	IP	DSCP
<b>set ip precedence</b>	IP	
<b>match ip address</b>		
<b>match length</b>		

-	-

### 38.1.4 ipv6 local policy route-map

no

**ipv6 local policy route-map** *route-map-name*

**no ipv6 local policy route-map**

--	--

---

<i>route-map-name</i>	<b>route-map</b>
<b>no</b>	

L

L

> IPv6 ping  
IPv6  
> 1

---

<b>set ipv6 precedence</b>	IPv6
<b>show ipv6 policy</b>	
<b>show route-map</b>	

<b>10.4</b>	

### 38.1.5 ipv6 policy

- set next-hop
- ipv6 policy .
- ipv6 policy {load-balance | redundance}**
- no ipv6 policy**

<b>set default interface</b>	
<b>set interface</b>	
<b>set ipv6 default next-hop</b>	
<b>set ipv6 next-hop</b>	
<b>show ipv6 policy</b>	

-

10.4	

### 38.1.6 ipv6 policy route-map

ipv6 policy route-map no

**ipv6 policy route-map** *route-map-name*

**no ipv6 policy route-map**

<i>route-map-name</i>	<b>route-map</b>

>	
>	1
<b>r</b>	

1	GigabitEthernet 1/38
2003:1000::10/80	2001:100::/64 AAA IPV6 ACL

---

```
                2003:1001::2
'                IPV6 ACL
Ruijie(config)#ipv6 access-list aaa
Ruijie(config-ipv6-acl)#permit ipv6 2003:1000::10/80 2001:100::/64
'                route-map
Ruijie(config)#
```

|

|

|

```
Ruijie#show ip policy
Banlance Mode  redundance
Interface      Route map
local          test
FastEthernet 0/0  test
```

|

<b>ip policy route-map</b>	
<b>ip local policy route-map</b>	

|

|


### 38.2.2 show ipv6 policy

|

	IPv6	show ipv6 policy
	show ipv6 policy [ <i>route-map-name</i> ]	
	<i>route-map-name</i>	

|

|

|

|

```
1
Ruijie#show ipv6 policy
```

---

```
Banlance Mode  redundance
Interface      Route map
VLAN 1        RM_for_Vlan_1
VLAN 2        RM_for_Vlan_2
```

Banlance Mode	
Interface	
Route map	

<b>show route-map</b>	

<b>10.4</b>	

## 39 IGMP

### 39.1

#### 39.1.1 ip igmp access-group

no

**ip igmp access-group** *access-list*

**no ip igmp access-group**

<i>access-list</i>	WORD <1-199> <1300-2699>

┌

┌

			<b>ip</b>
<b>igmp access-group</b>			
	IGMPv3		ACL
	MLD report	S1,S2,S3...Sn,G	(0,G)
<b>r</b>	ACL		
	ACL	(0, G)	
	S1,S2,S3...Sn,G		

```

1                               Eth0          225.2.2.2.
Ruijie# configure terminal
Ruijie(config)# access-list 1 permit 225.2.2.2 0.0.0.0
Ruijie(config)# interface ethernet 0
Ruijie(config-if)# ip igmp access-group 1
2                               Eth0          ACL
1.1.1.1,          233.3.3.3 igmp
Ruijie# configure terminal
Ruijie(config)# ip access-list extended ext_acl
Ruijie(config-ext-nacl)# permit ip host 0.0.0.0 host 233.3.3.3

```

```
Ruijie(config-ext-nacl)# permit ip host 1.1.1.1 host 233.3.3.3
Ruijie(config)# interface ethernet 0
Ruijie(config-if)# ip igmp access-group ext_acl
```

-	-

-	-

### 39.1.2 ip igmp join-group

no

**ip igmp join-group** *group-address*

**no ip igmp join-group** *group-address*

<i>group-address</i>	



	-	-

### 39.1.4 ip igmp last-member-query-count

**last-member-query-count** *leave* **no**  
**last-member-query-count** *no*

**ip igmp last-member-query-count** *number*

**no ip igmp last-member-query-count**

	<i>number</i>	, <2-7>

**last member query count** 2

┌

IGMPv2 **ip igmp last-member-query-count**

```

3
Ruijie# configure terminal
Ruijie(config)# interface ethernet 0
Ruijie(config-if)# ip igmp last-member-query-count 3
    
```

	-	-

┌

Ca@B4bj&@

**ip igmp last-member-query-interval** *interval*

**no ip igmp last-member-query-interval**

<i>interval</i>	<1-255> 0.1s

1s

IGMPv2

**ip igmp last-member-query-count**

20

```
Ruijie# configure terminal
Ruijie(config)# interface eth 0
Ruijie(config-if)# ip igmp last-member-query-interval 200
```

<b>ip igmp immediate-leave</b>	-

-	-

### 39.1.6 ip igmp limit ( )

igmp states

no

**ip igmp limit** *number* [*except access-list*]

**no ip igmp limit**

<i>number</i>	IGMP

<i>except</i>	access-list	limit
<i>access-list</i>		

1024

IGMP IGMP

300

Ruijie(config-if)# ip igmp limit 300

-	-

-	-

### 39.1.7 ip igmp limit ( )

igmp

no

**ip igmp limit** *number* [*except access-list*]

**no ip igmp limit** *number* [*except access-list*]

<i>number</i>	IGMP
<i>except</i>	access-list limit
<i>access-list</i>	

65536

IGMP  
IGMP

300

Ruijie config # `ip igmp limit 300`

-	-

-	-

### 39.1.8 ip igmp mroute-proxy

`ip igmp mroute-proxy interfname`

`no ip igmp mroute-proxy`

<i>interfname</i>	

gmp proxy-service

mroute-proxy

```
Ruijie(config-if)# ip igmp mroute-proxy fa 0/1
```

-	-

-

!

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-	-

### 39.1.10 ip igmp query-interval

no

**ip igmp query-interval** *seconds*

**no ip igmp query-interval**

<i>seconds</i>	s 1 18000

┌ 125

┌

┌

```

1      Ethernet 0          120s
Ruijie(config-if)# ip igmp query-interval 120
2      Ethernet 0
Ruijie(config-if)# no ip igmp query-interval
    
```

-	-

┌

-	-

### 39.1.11 ip igmp query-max-response-time

no

**ip igmp query-max-response-time** *seconds***no ip igmp query-max-response-time**

<i>seconds</i>	s	1	25

10s

IGMPv2

1 Ethernet 0 20s

Ruijie(config-if)# **ip igmp query-max-response-time 20**

2 Ethernet 0

Ruijie(config-if)# **no ip igmp query-max-response-time**

255s

IGMPv2  
**query-interval** Ruijie 255s **ip igmp**

1 Ethernet 0 200s  
Ruijie(config-if)# **ip igmp query-timeout 200**

2 Ethernet 0  
Ruijie(config-if)# **no ip igmp query-timeout**

3

```
Ruijie# configure terminal
Ruijie(config)# interface ethernet 0
Ruijie(config-if)# ip igmp robustness-variable 3
```

-	-

-	-

### 39.1.14 ip igmp ssm-map enable

**igmp ssm-map**

**ip igmp ssm-map enable**

**no ip igmp ssm-map enable**

-	-

-	-

### 39.1.15 ip igmp ssm-map static

ssm-map

**ip igmp ssm-map static** *access-list a.b.c.d*

**no ip igmp ssm-map static** *access-list a.b.c.d*

<i>access-list</i>	Acl <1-99>  <1300-1999>  WORD
<i>a.b.c.d</i>	

┌

┌

**ip igmp ssm-map enable** v3

ACL 11 192.168.2.2  
 Ruijie(config)# **ip igmp ssm-map static 11 192.168.2.2.**

-	-

┌

-	-

### 39.1.16 ip igmp static-group

no

**ip igmp static-group** *group-address*

**no ip igmp static-group** *group-address*

<i>group-address</i>	

└───┘

└───┘

└───┘

Eth0      236.6.6.6

┌

┌

igmp

igmp

┌

2

Ruijie# **configure terminal**

Ruijie(config)# **interface ethernet 0**

Ruijie(config-if)# **ip igmp version 2**

┌

-	-

┌

┌

-	-

## 39.2

### 39.2.1 clear ip igmp group

IGMP

**clear ip igmp group** *group-address* |

┌

<i>group-address</i>	32 IP D 8
<i>interface-type</i>	
<i>interface-number</i>	

┌

┌

┌

IGMP

IGMP

**clear ip igmp group**

Ruijie# **clear ip igmp group**

<b>show ip igmp groups</b>	-
<b>show ip igmp interface</b>	-

-	-

### 39.2.2 clear ip igmp interface

IGMP

**clear ip igmp interface *ifname***

<i>ifname</i>	

IGMP

*ifname*

-	-

### 39.2.3 show ip igmp groups

#### IGMP

**show ip igmp groups** [*group-address* | *interface-type interface-number*] [*detail*]

<i>group-address</i>	32 IP D 8
<i>interface-type</i>	
<i>interface-number</i>	
<i>detail</i>	

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

1

```

Ruijie# show ip igmp groups
IGMP Connected Group Membership
Group Address Interface Uptime Expires Last Reporter
224.0.1.1 eth2 00:00:09 00:04:17 10.10.0.82
224.0.1.24 eth2 00:00:06 00:04:14 10.10.0.84
224.0.1.40 eth2 00:00:09 00:04:15 10.10.0.91
224.0.1.60 eth2 00:00:05 00:04:15 10.10.0.7
239.255.255.250 eth2 00:00:12 00:04:15 10.10.0.228
239.255.255.254 eth2 00:00:08 00:04:13 10.10.0.84
  
```

2

```

Ruijie# show ip igmp groups 224.1.1.1 detail
Interface: eth1
Group: 224.1.1.1
  
```

\_\_\_\_\_

```
Uptime: 00:00:42
Group mode: Include
Last reporter: 192.168.50.111
TIB-A Count: 2
TIB-B Count: 0
Group source list: (R - Remote, M - SSM Mapping)
Source Address Uptime v3 Exp Fwd Flags
192.168.55.55 00:00:42 00:03:38 Yes R
192.168.55.66 00:00:42 00:03:38 Yes R
```



IGMP Active, Non-Querier, Version 3 (default)  
IGMP querying router is 0.0.0.0  
IGMP query interval is 125 seconds  
IGMP querier timeout is 255 seconds  
IGMP max query response time is 10 seconds  
Last member query response interval is 1000 milliseconds  
Group Membership interval is 260 seconds  
IGMP Snooping is globally enabled  
IGMP Snooping is enabled on this interface  
IGMP Snooping fast-leave is not enabled  
IGMP Snooping querier is not enabled  
IGMP Snooping report suppression is enabled

-	-

```
SSM Mapping : Enabled
Database    : Static mappings configured
      2      233.3.3.3
Ruijie#show ip igmp ssm-mapping 233.3.3.3
Group address: 233.3.3.3
Database    : Static
Source list : 192.3.3.3
              : 3.3.3.3
```


-	-

-	-

# 40 PIM-DM

## 40.1 PIM-DM

### 40.1.1 ip pim dense-mode

	PIM-DM	ip pim dense-mode	no
	PIM-DM		
	ip pim dense-mode		
	no ip pim dense-mode		
			
	PIM-DM	6 . ~/U*ü	
	PIM-DM		
		ú	


### 40.1.2 ip pim neighbor-filter

**ip pim neighbor-filter**  
PIM-DM

Peering

no

**ip pim neighbor-filter** *access-list*

**no ip pim neighbor-filter** *access-list*

<i>access-list</i>	access-list acl	acl	1-99

	-	-

### 40.1.3 ip pim override-interval

hello override-interval **ip pim override-interval**  
 no hello override-interval

**ip pim override-interval** *interval-milliseconds*

**no ip pim override-interval**

	<i>interval-milliseconds</i>	<1-65535>
	2500	

### 40.1.4 ip pim query-interval

hello interval                      **ip pim query-interval**

no                      hello interval

**ip pim query-interval** *interval-seconds*

**no ip pim query-interval**

<i>interval-seconds</i>	<1-65535>

30

hello interval   hello holdtime                      hello interval   3.5

```
Ruijie# configure terminal
Ruijie(config)# interface fastethernet 0/1
Ruijie(config-if)# ip pim query-interval 123
```



### 40.1.5 ip pim propagation-delay

hello                      propagation-delay                      **ip pim propagation-delay**

no                      hello                      propagation-delay

**ip pim propagation-delay** *interval-milliseconds*

**no ip pim propagation-delay**

--	--

	<i>interval-milliseconds</i>	<1-32767>
	500	
	propagation-delay	
	propagation-delay 600	
	Ruijie# <b>configure terminal</b>	
	Ruijie(config)# <b>interface fastethernet 0/1</b>	
	Ruijie(config-if)# <b>ip pim propagation-delay 600</b>	

### 40.1.6 ip pim state-refresh disable

	PIM-DM	<b>ip pim state-refresh disable</b>
	no PIM-DM	
	<b>ip pim state-refresh disable</b>	
	<b>no ip pim state-refresh disable</b>	
	Hello	Hello
	Hello	SR Cap

	<b>ip pim state-refresh disable</b>	
<b>r</b>		PIM-DM

```

PIM-DM
Ruijie# configure terminal
Ruijie(config)# ip pim state-refresh disable
    
```


┌


### 40.1.7 ip pim state-refresh origination-interval

PIM-DM

**ip pim state-refresh origination-interval**

no

**ip pim state-refresh origination-interval** *interval-seconds*

no **ip pim state-refresh origination-interval**

<i>interval-seconds</i>	<1-100>

┌ 60

┌

┌

```

Ruijie# configure terminal
Ruijie(config)# interface fastethernet 0/1
Ruijie(config-if)# ip pim state-refresh
    
```

```
origination-interval 65
```


## 40.2 PIM-DM

### 40.2.1 show ip pim dense-mode interface

PIM-DM aB61QÄ

detail


/ /

#### ip pim dense-mode interface

Ruijie# B.6w ip pim dense-mode interface

Interface	VIFIndex	Ver/	Nbr
-----------	----------	------	-----

VIF Index	VIF ID
Ver/Mode	PIM /
Nbr Count	PIM-DM

<b>show ip pim dense-mode neighbor</b>	PIM-DM
--	--------

--	--

### 40.2.2 show ip pim dense-mode mroute

PIM-DM show ip pim dense-mode mroute

**show ip pim dense-mode mroute [ A.B.C.D A.B.C.D ] [ summary ]**

<i>A.B.C.D A.B.C.D</i>	
<i>summary</i>	

/ /

/

```

Downstream IF List:
FastEthernet 0/45:
Downstream State: NoInfo
Assert State: Loser, AT:170
    
```



### 40.2.3 show ip pim dense-mode neighbor

PIM-DM **show ip pim dense-mode neighbor**

**show ip pim dense-mode neighbor** [ *interface-type interface-number* ]

<i>interface-type interface-number</i>	

/ /

#### **show ip pim dense-mode neighbor**

```

Ruijie# show ip pim dense-mode neighbor
Neighbor-Address Interface      Uptime/Expires   Ver
10.10.10.1      FastEthernet 0/45 00:19:29/00:01:21 v2
50.50.50.1      VLAN 4          00:22:09/00:01:39 v2
    
```

Neighbor-Address	
Interface	

Uptime/Expires	
Ver	PIM

Metric	
Pref	

Assert: 0 0  
State-Refresh: 0 0  
PIM-SM-Register: 0 0  
PIM-SM-Register-Stop: 0 0  
PIM-SM-BSM: 0 0  
PIM-SM-C-RP-ADV: 0 0

Unknown Type: 0  
Errors:  
Malformed packets: 0  
Bad checksums: 0  
Unknown PIM version: 0  
Send errors: 0

!AeAv&S v



dens

	<b>show ip pim dense-mode track</b>	PIM


# 41 PIM-SM

## 41.1 PIM-SM

### 41.1.1 clear ip mroute

**clear ip mroute** { \* | *group\_address* [*source\_address*] }

*	pimsm
<i>group_address</i>	pimsm
<i>group_address source_address</i>	pimsm

└───┘

└───┘

└───┘

pimsm

└───┘

```
Ruijie# clear ip mroute *
Ruijie# clear ip mroute 224.2.2.2
Ruijie# clear ip mroute 224.2.2.2 2.2.2.2
```

Si

2

*	pimsm
group_address	pimsm
group_address source_address	pimsm

└───

└───

└─── pimsm

```
Ruijie# clear ip mroute statistics *
Ruijie# clear ip mroute statistics 224.2.2.2
Ruijie# clear ip mroute statistics 224.2.2.2 2.2.2.2
```

-	-

└───

-	-

### 41.1.3 clear ip pim sparse-mode bsr rp-set

**clear ip pim sparse-mode bsr rp-set \***

*	rp-set

└─── rp-set

└───

└─── RP

```
Ruijie# clear ip pim sparse-mode bsr rp-set *
```

-	-

-	-

### 41.1.4 clear ip pim sparse-mode track

**clear ip pim sparse-mode track**

-	-

PIM

PIM

```
Ruijie# clear ip pim sparse-mode track
```

<b>show ip pim sparse-mode track</b>	-

-	-

### 41.1.5 ip multicast-routing

**ip multicast-routing**





**ip pim accept-crp-with-null-group**

	-		-		
	BSR	prefix-count	0	C-RP-ADV	
	0	BSR C-RP-ADV	BSR C-RP	BSR	prefix-count
	Ruijie# <b>configure terminal</b>				
	Ruijie(config)# <b>ip pim accept-crp-with-null-group</b>				
	-		-		
	-		-10.4(1)		

**41.1.9 ip pim accept-register list**

**ip pim accept-register list access-list**

	<i>access-list</i>	access-list	<100 199>	
		<2000 2699>	acl	
		RP		
	RP			
	Ruijie (config)# <b>ip pim accept-register list 100</b>			

```
Ruijie (config)# access-list 100 permit ip 192.168.195.0 0.0.0.255
225.1.1.1 0.0.0.255
```

<b>access-list</b>	-

-	-

### 41.1.10 ip pim bsr-candidate

```
ip pim bsr-candidate interface-type interface-number [ hash-mask-length ]
[ priority-value ]
```

<i>interface-type interface-number</i>	
<i>hash-mask-length</i>	<0-32> RP HASH 10
<i>priority-value</i>	<0-255> BSR 64

BSR

```

PIM-SM                                BSR BSR                                RP
C-BSR    BSR                            BSR    BSR
          BSR                            224.0.0.13
          BSR
          BSR                                PIM
          BSR
          BSR                                BSR
          BSR                                BSR
          BSR                                BSR
IP
```

```
Ruijie# configure terminal
Ruijie(config)# ip pim bsr-candidate g 0/3
Ruijie(config)# ip pim bsr-candidate g 0/3 30 192
```

-	-

-	-

### 41.1.11 ip pim bsr-border

#### ip pim bsr-border

-	-

BSR

BSM                                  BSR                                  BSM  
BSM

g 0/3      BSR

```
Ruijie# configure terminal
Ruijie(config)# interface g 0/3
Ruijie(config-if)# ip pim bsr-border
```

-	-

--	--

	-	-
--	---	---

### 41.1.12 ip pim dr-priority

**ip pim dr-priority** *priority-value*

	<i>priority-value</i>	<0-4294967294> 1

	DR	1
--	----	---

--	--	--

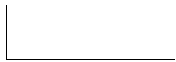
~~191.1B5B46D21CDD8061528A658E-32.497FE>6<02D6Td(4<02DR)Tj/C2\_0 1 Tf467a1D506 Td[DR~~



L

L

-	-



PIM  
PIM-SM peering



```
Ruijie# configure terminal
Ruijie(config)# interface g 0/3
Ruijie(config-if)# ip pim neighbor-filter 14
Ruijie(config-if)# exit
Ruijie(config)#access-list 14 deny 192.168.1.5 0.0.0.255
```



<b>access-list</b>	-



-	-

### 41.1.17 ip pim neighbor-tracking

#### ip pim neighbor-tracking



-	-



join

```
join
```

```
Ruijie# configure terminal  
Ruijie(config)# interface g 0/3  
Ruijie(config-if)# ip pim neighbor-tracking
```

ip pim propagation-delay	-

**ip pim override-interval** *interval-milliseconds*

	<b>ip pim propagation-delay-</b>	-
	-	-

### 41.1.19 ip pim propagation-delay

**ip pim propagation-delay interval-milliseconds**

	<i>interval-milliseconds</i>	<1-32767>

Hello Propagation\_Delay 500

propagation-delay	
r	J/P-override-interval J/P-override-interval
	Join-Prune holdtime

```

propagation-delay 600
Ruijie# configure terminal
Ruijie(config)# interface g0/3
Ruijie(config-if)# ip pim propagation-delay 600
    
```

	<b>ip pim override-interval</b>	-
	<b>ip pim neighbor-tracking</b>	-



	-	-
--	---	---

### 41.1.20 ip pim probe-interval

**ip pim probe-interval** *interval-seconds*

		<b>PIM-SM</b>
--	--	---------------

hello 30s

Hello Hello Hello Hello  
65535 Hello 3.5 Hello \* 3.5 >  
18725

```
Ruijie# configure terminal  
Ruijie(config)# interface g 0/3  
Ruijie(config-if)# ip pim query-interval 123
```



```
Ruijie# configure terminal
```

```
Ruijie(config)# ip pim register-decapsulate-forward
```

-	-

-	-

### 41.1.23 ip pim register-checksum-wholepkt

```
ip pim register-checksum-wholepkt [group-list access-list]
```

--	--

|

|

-	-

### 41.1.24 ip pim register-rate-limit

**ip pim register-rate-limit** *rate*

|

<i>rate</i>	register <1-65535>

|

|

|

S G

DR RP

|

```
Ruijie# configure terminal
Ruijie(config)# ip pim register-rate-limit 3000
```

|

-	-

|

|

-	-

### 41.1.25 ip pim register-rp-reachability

**ip pim register-rp-reachability**

|

--	--

	-	-
--	---	---

```
Ruijie(config)# ip pim register-source 192.168.195.80
Ruijie(config)# ipv6 pim register-source g 0/3
```

-	-

-	-

### 41.1.27 ip pim register-suppression

**ip pim register-suppression** *seconds*

<i>seconds</i>	<1-65535>

60

DR RP DR RPkeepalive ip pim rp-register-kat

```
Ruijie# configure terminal
Ruijie(config)# ip pim register-suppression 100
```

-	-

-	-

### 41.1.28 ip pim rp-address

**ip pim rp-address** *rp-address* [*access\_list*]

<i>rp-address</i>	RP ip		
<i>access_list</i>	access-list <1300-1999>	acl acl	<1-99>

rp

```

RP RP BSR
> BSR RP
> RP ACL
ACL RP
> RP RP
> ACL ACL
224/4
> RP RP RP
RP RP IP
> RP IP
RP
RP
    
```

```

Ruijie# configure terminal
Ruijie(config)# ip pim rp-address 210.34.0.55
Ruijie(config)# ip pim rp-address 210.34.0.55 4
Ruijie(config)# access-list 4 permit 225.1.1.1 0.0.0.255
    
```

<b>access-list</b>	-

-	-

## 41.1.29 ip pim rp-candidate

**ip pim rp-candidate** *interface-type interface-number* [**priority** *priority-value*] [**interval** *interval-seconds*][**group-list** *access\_list*]



---

---

<1-65535>

---

er-kat 250

	-

---

```

PIM-SM
PIM-SM
PIM-SM IGMP

Failed to enable PIM-SM on <
/ >, resource temporarily unavailable, please try again

PIM-SM Configure failed! VIF limit
exceeded in NSM!!!

PIM-DM DVMRP
v4
    
```

```

Ruijie# configure terminal
Ruijie(config)# interface g 0/3
Ruijie(config-if)# ip pim sparse-mode
    
```

-	-

-	-

### 41.1.32 ip pim spt-threshold

**ip pim spt-threshold [group-list access-list]**

	access-list      acl      1-99
<i>access-list</i>	1300-1999      acl
	group-list access-list
	SPT

SPT

```

rp      spt
      SPT      group-list
group-list      SPT
    
```

```

Ruijie# configure terminal
Ruijie(config)# ip pim spt-threshold
Ruijie(config)# ip pim spt-threshold group-list 12
Ruijie(config)# access-list 12 permit 225.1.1.1 0.0.0.255
    
```

<b>access-list</b>	-

-	-

### 41.1.33 ip pim ssm

**ip pim ssm { default / range access\_list}**

<i>default</i>	232/8
<i>access_list</i>	acl      1-99      acl

SSM

```

pim ssm      pim ssm
    
```

```

1      232/8
Ruijie# configure terminal
Ruijie(config)# ip pim SSM default
2      10
Ruijie(config)# ip pim SSM range 10
Ruijie(config)# access-list 10 permit 232.0.0.1 0.0.0.255
    
```





\_\_\_\_\_ / \_\_\_\_\_ /

\_\_\_\_\_ BSR

```
Ruijie# show ip pim sparse-mode bsr-router
      show ip pim sparse-mode bsr-router
Ruijie# show ip pim sparse-mode bsr-router
PIMv2 Bootstrap information
This system is the Bootstrap Router (BSR)
BSR address: 192.168.127.1
Uptime: 01d23h14m, BSR Priority: 64, Hash mask length: 10
Next bootstrap message in 00:00:42
Role: Candidate BSR Priority: 64, Hash mask length: 10
State: Elected BSR
Candidate RP: 30.30.100.200(GigabitEthernet 0/3)
Advertisement interval 60 seconds
Next Cand_RP_advertisement in 00:00:32
```

-	-

\_\_\_\_\_

-	-

### 41.2.3 show ip pim sparse-mode interface

**show ip pim sparse-mode interface** [*interface-type interface-number* **[detail]** ]

<i>interface-type interface-number</i>	
<i>detail</i>	

\_\_\_\_\_

/ /

PIM SM

```
Ruijie#show ip pim sparse-mode interface g 0/4 detail
```

```
Ruijie#show ip pim sparse-mode interface
```

```
Ruijie#show ip pim sparse-mode interface g 0/3
```

**show ip pim sparse-mode interface detail**

```
Ruijie #show ip pim sparse-mode interface detail
```

```
GigabitEthernet 0/3 (vif 3):
```

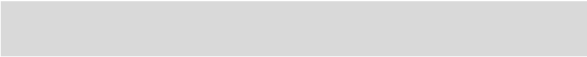
```
Address 30.30.100.200, DR 30.30.100.200
```

```
Hello period 30 seconds, Next Hello in 11 seconds
```

```
Triggered Hello period 5 seconds
```

```
Neighbors:
```

```
2.2.2.2
```



PIM SM

IGMP

```
Ruijie# show ip pim local-members
Ruijie# show ip pim local-members g 0/3
          sh ip pim sparse-mode local-members
Ruijie (config-if)#sh ip pim sparse-mode local-members
PIM Local membership information
GigabitEthernet 0/3:
(*, 225.1.1.1) : Include
Loopback 1:
GigabitEthernet 0/5:
```

-	-

-	-

### 41.2.5 show ip pim sparse-mode mroute

**show ip pim sparse-mode mroute** {*group\_address* | *source\_address* | }

<i>group_address</i>	A.B.C.D
<i>source_address</i>	A.B.C.D
	( )

/ /

```

Ruijie# show ip pim sparse-mode mroute
Ruijie# show ip pim sparse-mode mroute 40.40.40.11
Ruijie# show ip pim sparse-mode mroute 235.0.0.1
Ruijie# show ip pim sparse-mode mroute 235.0.0.1 40.40.40.11
sh ip pim sparse-mode mroute
Ruijie (config-if)#sh ip pim sparse-mode mroute
    
```

-	-

-	-

### 41.2.6 show ip pim sparse-mode neighbor

**show ip pim sparse-mode neighbor [detail]**

<b>detail</b>	

/ /

```

Ruijie# show ip pim sparse-mode neighbor
Ruijie# show ip pim sparse-mode neighbor detail
show ip pim sparse-mode neighbor
Ruijie (config-if)#sh ip pim sparse-mode neighbor
    
```

-	-



```

/
/

```

```

rp

```

```

Ruijie #show ip pim sparse-mode rp mapping

```

```

Ruijie (config)#sh ip pim sparse-mode rp mapping

```

```

PIM Group-to-RP Mappings

```

```

Group(s): 224.0.0.0/4

```

```

RP: 30.30.200.1

```

```

Info source: 30.30.200.1, via bootstrap, priority 192

```

```

Uptime: 00:00:51, expires: 00:01:39

```

```

RP: 30.30.100.1

```

```

Info source: 30.30.200.1, via bootstrap, priority 192

```

```

Uptime: 00:19:14, expires: 00:01:38

```

```

Group(s): 224.0.0.0/4, Static

```

```

RP: 100.100.100.100

```

```

Uptime: 00:45:35

```

-	-

```


```

-	-

#### 41.2.9 show ip pim sparse-mode rp-hash

**show ip pim sparse-mode rp-hash *group-address***

<i>group-address</i>	

```


```

```

/
/

```



RP

Ruijie#

```

Hello:                0          8
Join-Prune:           0          0
Register:             0          0
Register-Stop:       0          0
Assert:              0          0
BSM:                  0          0
C-RP-ADV:            0          0
PIMDM-Graft:         0
PIMDM-Graft-Ack :    0
PIMDM-State-Refresh: 0
Unknown PIM Type:    0
Errors:
Malformed packets:           0
Bad checksums:               0
Send errors:                  0
Packets received with unknown PIM version: 0
    
```

-	-

-	-

## 42 IPv4

### 42.1 IPv4

#### 42.1.1 clear ip mroute

IP

```
clear ip mroute { * | group-address [source -address]}
```

*	
group-address	
source -address	

```
└─┘
```

```
└─┘
```

```
└─┘
```

```
└─┘
```

230.0.0.1

```
Ruijie# clear ip mroute 230.0.0.1
```

show ip mroute	

```
└─┘
```

-	-

#### 42.1.2 clear ip mroute statistics

IP

**clear ip mroute statistics** { \* | *group-address* [*source -address*]



\*

4~ • °P><4³A| [Qd0a hîf,|s0%ÀMæhđ g•#ÛBÿ %^!••=đ\_ \$đ@à

<i>rpf-address</i>	
<i>interface-type interface-number</i>	
<i>distance</i>	0 <0-255> RPF

*Distance Distance 0*

RFF

rpf ip bgp

rpf distance distance

rpf rpf

172.30.10.13

Ruijie(config)# **ip mroute** 172.16.0.0 255.255.0.0 172.30.10.13

-	-

-	-

### 42.1.4 ip multicast boundary

IP IP no

**ip multicast boundary** *access-list*

**no ip multicast boundary** *access-list*

<i>access-list</i>	IP access-list ACL



ACL IP IP ACL ACL  
ACL ACL ACL ACL  
4220 svi1 4) E-2/0, S1-0-N&P5!hy%!E anj5!LÑ'RA.àPñ"Rŷ!L.àPŷ

```
limit      1024
threshold  2147483647
```

IPv6

r

500

```
Ruijie(config)# ip multicast route-limit 500
```

-	-

-	-

### 42.1.6 ip multicast-routing

no

ip multicast-routing

no ip multicast-routing

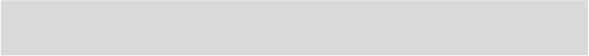
-	-

IPv4

IPv4

	IPv4	IGMP snooping
r		IGMP snooping
/		v4

```
Ruijie(config)# ip multicast-rounting
```



---

|

|

```
(192.168.43.4 225.1.1.5)      GigabitEthernet 2/6
FastEthernet 3/2
ruijie(config)# ip multicast static 192.168.43.4 225.1.1.5 G2/6
ruijie(config)# ip multicast static 192.168.43.4 225.1.1.5 F3/2
```

|

-	-

|

|

--	--

	-	-
	-	-

### 42.1.9 ip multicast rpf longest-match

```

FD:          A6; D          A6; D          FD:
          A6; D
          MBGP
          no
          MBGP
    
```

**ip multicast rpf longest-match**  
**no ip multicast rpf longest-match**

	-	-

```

          FD:          A6; D          A6; D          FD:
          A6; D
          MBGP
    
```

┌

┌

┌

```
Ruijie(config)# ip multicast rpf longest-match
```

	-	-

---

-	10.4 2

## 42.2 IP

### 42.2.1 show ip mroute

**show ip mroute** [ *group-address*] [ *source-address*] [**dense**][ **sparse**] [**summary**] [**count**]

<i>group-address</i>	
<i>source-address</i>	
<b>dense</b>	PIMDM
<b>sparse</b>	PIMSM
<b>summary</b>	

FastEthernet 1/3

2

Ruijie# **show ip mroute 10.10.1.52 224.0.1.3**

IP Multicast Routing Table

Flags: I - Immediate Stat, T - Timed Stat, F - Forwarder installed

Timers: Uptime/Stat Expiry

Interface State: Interface (TTL)

(10.10.1.52, 224.0.1.3), uptime 00:03:24, stat expires 00:01:28

Owner PIM-SM, Flags: TF

Incoming interface: FastEthernet 2/1

Outgoing interface list:

FastEthernet 1/3

3

Ruijie# **show ip mroute count**

IP Multicast Statistics

Total 1 routes using 132 bytes memory

Route limit/Route threshold: 2147483647/2147483647

Total NOCACHE/WRONGVIF/WHOLEPKT rcv from fwd: 1/0/0

Total NOCACHE/WRONGVIF/WHOLEPKT sent to clients: 1/0/0

Immediate/Timed stat updates sent to clients: 0/0

Reg ACK rcv/Reg NACK rcv/Reg pkt sent: 0/0/0

Next stats poll: 00:01:10

Forwarding Counts: Pkt count/Byte count, Other Counts: Wrong If pkts

Fwd msg counts: WRONGVIF/WHOLEPKT rcv

Client msg counts: WRONGVIF/WHOLEPKT/Imm Stat/Timed Stat sent

Reg pkt counts: Reg ACK rcv/Reg NACK rcv/Reg pkt sent

(10.10.1.52, 224.0.1.3), Forwarding: 2/19456, Other: 0

Fwd msg: 0/0, Client msg: 0/0/0/0, Reg: 0/0/0

4

Ruijie# **show ip mroute summary**

IP Multicast Routing Table

Flags: I - Immediate Stat, T - Timed Stat, F - Forwarder installed

Timers: Uptime/Stat Expiry

Interface State: Interface (TTL)

(10.10.1.52, 224.0.1.3), 00:01:32/00:03:20, PIM-SM, Flags: T

Flags	I- T- F-
Timers:Uptime/Stat Expiry	
Interface State	
Owner	
Incoming interface	
Outgoing interface list	
Forwarding Counts Pkt count/Byte count,	/
Other Counts: Wrong If pkts	



```

RPF recursion count: 0
Doing distance-preferred lookups across tables
Distance: 0
Metric: 0 RPF information for 192.168.1.54
RPF interface: VLAN 1
RPF neighbor: 0.0.0.0
RPF route: 192.168.1.0/24
RPF type: unicast (connected)
RPF recursion count: 0
Doing distance-preferred lookups across tables
Distance: 0
Metric: 0
    
```

-	-

-	-

### 42.2.4 show ip mvif

**show ip mvif** { *interface-type interface-number* }

<i>interface-type interface-number</i>	

```

svi1
Ruijie# show ip mvif vlan 1
    
```

Interface	Vif	Owner	TTL	Local	Remote
Uptime					
Idx	Module	Address	Address		
VLAN 1	1	PIM-DM	2	192.168.1.1	0.0.0.0
00:13:16					

-	-

└──

-	-

## 42.3 IP

### 42.3.1 debug nsm mcast all

no

debug nsm mcast all

-	-

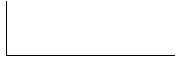
└──

└──

└──

Ruijie# debug nsm mcast all

-	-



---

-	-
---	---

---

|

|

|

|

Ruijie# **debug nsm mcast register**

-	-

---

|

-	-

---

### 42.3.4 debug nsm mcast stats

no

**debug nsm mcast stats**

-	-

---

|

|

|

|

Ruijie# **debug nsm mcast stats**

	-	-

└───┘

	-	-

### 42.3.5 debug nsm mcast vif

no

**debug nsm mcast vif**


└───┘

└───┘

└───┘

└───┘

Ruijie# **debug nsm mcast vif**

	-	-

└───┘

	-	-

# 43 IPv6

## 43.1

### 43.1.1 ping ipv6

IPV6

ping ipv6 [ipv6-address]

ipv6-addres	s

└───┘

└───┘

└───┘

└───┘

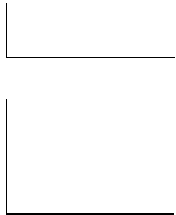
Ruijie# ping ipv6 fec0::1

ping

!	
.	
U	
R	
F	
A	
D	Down IPV6 ( )
?	

└───┘

-	-



-	-

### 43.1.2 ipv6 address

IPV6 , no

**ipv6 address** *ipv6-address/prefix-length*

**ipv6 address** *ipv6-prefix/prefix-length eui-64*

**ipv6 address** *prefix-name sub-bits/prefix-length [eui-64]*

**no ipv6 address**

**no ipv6 address** *ipv6-address/prefix-length*

**no ipv6 address** *ipv6-prefix/prefix-length eui-64*

**no ipv6 address** *prefix-name sub-bits/prefix-length [eui-64]*



<i>ipv6-address</i>	IPV6 RFC4291 16
<i>ipv6-prefix</i>	IPV6 RFC4291 16
<i>prefix-length</i>	IPV6 IPV6
<i>prefix-name</i>	
<i>sub-bits</i>	RFC4291
<b>eui-64</b>	IPV6 64 ID



```

IPv6
UP
IPv6
+
DHCPv6
+
no ipv6 address
no ipv6 address ipv6-prefix/prefix-length eui-64
ipv6-prefix/prefix-length eui-64
IPv6
=
+
ipv6 general-prefix
DHCPv6
sub-bits/prefix-length
ipv6 address

```

```

1
IPv6
Ruijie(config-if)# ipv6 address 2001:1::1/64
Ruijie(config-if)# no ipv6 address 2001:1::1/64
Ruijie(config-if)# ipv6 address 2002:1::/64 eui-64
Ruijie(config-if)# no ipv6 address 2002:1::/64 eui-64
2
Ruijie(config-if)# ipv6 address my-prefix 0:0:0:7272::72/64
my-prefix 2001:1111:2222::/48 IPv6
2001:1111:2222:7272::72/64

```

<b>ipv6 address autoconfig</b>	
<b>ipv6 general-prefix</b>	
<b>show ipv6 general-prefix</b>	

RGOS10.4	IPv6 RGOS10.4

### 43.1.3 ipv6 address autoconfig

```

no
ipv6 address autoconfig [default]
no ipv6 address autoconfig
IPv6
ipv6 address autoconfig

```

<b>default</b>	<b>default</b>

┌  
└

RA RA  
 EUI-64  
 RA DHCPv6  
 DNS IPv6 NTP IPv6  
**no ipv6 address autoconfig** IPv6

```
Ruijie(config-if)# ipv6 address autoconfig default
Ruijie(config-if)# no ipv6 address autoconfig
```

<b>ipv6 address</b> <i>ipv6-prefix/prefix-length</i> [eui-64]	IPv6

┌  
└

RGOS10.4	RGOS10.4

### 43.1.4 ipv6 enable

IPv6 no IPv6  
**ipv6 enable**  
**no ipv6 enable**

-	-

┌ IPv6  
└

2	IPv6	<b>ipv6 enable</b>
	IPv6	
<b>r</b>	IPv6	IPv6
	<b>no ipv6 enable</b>	IPV6

Ruijie(config-if)# **ipv6 enable**

<b>show ipv6 interface</b>	
----------------------------	--

-	-
---	---

### 43.1.5 ipv6 general-prefix

IPv6

**ipv6 general-prefix**

**ipv6 general-prefix** *prefix-name ipv6-prefix/prefix-length*

**no ipv6 general-prefix** *prefix-name ipv6-prefix/prefix-length*

<i>prefix-name</i>	
<i>ipv6-prefix</i>	RFC4291
<i>prefix-length</i>	

IPv6

my-prefix

Ruijie(config)# **ipv6 general-prefix** my-prefix 2001:1111:2222::/48


**ipv6 address** prefix-name

sub-bits/prefix-length

	-	-
	-	-

### 43.1.7 ipv6 nd dad attempts

```

                IPV6                                (NS)
                no
    ipv6 nd dad attempts value
    no ipv6 nd dad attempts
    
```

value	(NS)	0
	0-600	ipv6 :

```

1

```

```

                IPV6
                "tentative"( )
                EUI-64
                ( IPV6 )
                down/up
                down up
    
```

```

Ruijie(config)# interface vlan 1
Ruijie(config-if)# ipv6 nd dad attempts 3
    
```

<b>show ipv6 interface</b>	

-	-

### 43.1.8 ipv6 nd managed-config-flag

“managed address configuration”

no

**ipv6 nd managed-config-flag**

**no ipv6 managed-config-flag**

-	-

┌

┌

┌

```
Ruijie(config)# int vlan 1
Ruijie(config)# ipv6 nd managed-config-flag
```

<b>show ipv6 interface</b>	ra-info
<b>ipv6 nd other-config-flag</b>	

┌

-	-

### 43.1.9 ipv6 nd ns-interval

(NS)

no

**ipv6 nd ns-interval** *milliseconds*

**no ipv6 nd ns-interval**

milliseconds		1000-4294967295

(RA) 0( )  
1000ms(1 )

(RA)

Ruijie(config-if)# **ipv6 nd ns-interval 2000**

<b>show ipv6 interface</b>		

-		-

### 43.1.10 ipv6 nd prefix

(RA)

no

**ipv6 nd prefix** *ipv6-prefix/prefix-length* | **default** [ [ *valid-lifetime preferred-lifetime* ] | [ **at** *valid-date preferred-date* ] | **infinite** | **no-advertise** ] [ **off-link** ] [ **no-autoconfig** ]

**no ipv6 nd prefix** *ipv6-prefix/prefix-length* | **default** { [ **off-link** ] [ **no-autoconfig** ] | [ **no-advertise** ] }

<i>ipv6-prefix</i>	IPV6	RFC4291
<i>prefix-length</i>	IPV6	'/'

<i>valid-lifetime</i>	
<i>preferred-lifetime</i>	
<b>at</b> <i>valid-date preferred-date</i>	
<b>infinite</b>	
<b>default</b>	
<b>no-advertise</b>	
<b>off-link</b>	IPV6 (on-link) on-link
<b>no-autoconfig</b>	

IPV6 address

*valid-lifetime*: 2592000 (30 )  
*preferred-lifetime*: 604800 (7 ),  
 on-link

(RA) ipv6 address

**ipv6 nd prefix default**

ipv6 nd prefix default

ipv6 nd prefix default

**at** *valid-date preferred-date*

2

0

1 SVI 1

```
Ruijie(config)#interface vlan 1
Ruijie(config-if)# ipv6 nd prefix 2001::/64 infinite 2592000
```

```

2          SVI 1          (          )
Ruijie(conifg)# interface vlan 1
Ruijie(conifg-if)# ipv6 nd default no-autoconfig
    
```

<b>show ipv6 interface</b>	ra-info

-	-

### 43.1.11 ipv6 nd ra-lifetime

(RA) no

**ipv6 nd ra-lifetime** *seconds*

**no ipv6 nd ra-lifetime**

seconds	

1800

```

"          "          (RA)
          0          0
(ra-interval)          (RA)
    
```

```

Ruijie(conifg)# interface vlan 1
Ruijie(conifg-if)# ipv6 nd ra-lifetime 2000
    
```

--	--

<b>show ipv6 interface</b>	ra-info
<b>ipv6 nd ra-interval</b>	
<b>ipv6 nd ra-hoplimit</b>	
<b>ipv6 nd ra-mtu</b>	MTU
-	-

### 43.1.12 ipv6 nd ra-interval

(RA)

no

**ipv6 nd ra-interval** {*seconds* | *min-max min\_value max\_value*}

**no ipv6 nd ra-interval**

<i>seconds</i>	(RA)
<i>min-max</i>	
<i>min_value</i>	
<i>max_value</i>	

200

200

20

**min-max**

```
Ruijie(config)# interface vlan 1
```

```
Ruijie(config-if)# ipv6 nd ra-interval 110
```



<b>ipv6 nd ra-lifetime</b>	
<b>ipv6 nd ra-interval</b>	
<b>ipv6 nd ra-mtu</b>	MTU

┌

┌

-	-

### 43.1.15 ipv6 nd reachable-time

NDP  
no

**ipv6 nd reachable-time** *milliseconds*

**no ipv6 nd reachable-time**

┌

<i>milliseconds</i>	0-3600000

┌

(RA) 0( )  
30000ms(30 )

┌

┌

0 (RA)

┌

Ruijie(config-if)# **ipv6 nd reachable-time 1000000**

┌

<b>show ipv6 interface</b>	

┌

┌

-	-

### 43.1.16 ipv6 nd suppress-ra

	(RA)	(RA)	no
<b>ipv6 nd suppress-ra</b>			
<b>no ipv6 nd suppress-ra</b>			

<i>interface-id</i>	SVI	Routed Port,L3 AP	
<i>hardware-address</i>		XXXX.XXXX.XXXX	48

	-	-

```
Ruijie(config)# interface vlan 1
Ruijie(config-if)# ipv6 redirects
```

<b>show ipv6 interface</b>	

-	-

### 43.1.20 ipv6 route

IPV6

no

**ipv6 route** *ipv6-prefix/prefix-length* {*ipv6-address* | *interface-id* [*ipv6-address*]}

**no ipv6 route** *ipv6-prefix/prefix-length* [*ipv6-address* | *interface-id* [*ipv6-address*]]

<i>ipv6-prefix</i>	IPV6 RFC4291
<i>prefix-length</i>	IPV6 '/'
<i>ipv6-address</i>	RFC4291
<i>interface-id</i>	

r

	-	-
	-	-

### 43.1.22 tunnel destination

, no

**tunnel destination** {*ipv4-address* | *ipv6-address*}

**no tunnel destination**

<i>ipv4-address</i>	,	IPv4
<i>ipv6-address</i>	mode gre ipv6	tunnel mode ipv6 IPv6 tunnel IPV6

**r** (6to4 isatap)

IPv6  
Ruijie(config)# **interface tunnel 1**  
Ruijie(config-if)# **tunnel mode ipv6ip**  
Ruijie(config-if)# **tunnel source vlan 1**  
Ruijie(config-if)# **tunnel destination 192.168.5.1**

--	--

**tunnel source**

9

	RGOS10.4	RGOS10.4
--	----------	----------

### 43.1.24 tunnel mode ipv6ip

IPV6 , no IPv6

**tunnel mode ipv6ip [6to4 | isatap]**

**no tunnel mode**



GRE

,

no

IPv6

**tunnel mode gre [ip | ipv6]****no tunnel mode**

<b>ip</b>	IPv4
<b>ipv6</b>	IPv6

IPv6

```

ipv6          gre          tunnel mode gre  ip
destination   gre          tunnel source, tunnel destination,
UP

```

gre

```

Ruijie(config)# interface tunnel 1
Ruijie(config-if)# tunnel mode gre ip
Ruijie(config-if)# tunnel source vlan 1
Ruijie(config-if)# tunnel destination 1.1.1.1

```

**no tunnel source**

<i>ipv4-address</i>		IPv4	IPv4
<i>ipv6-address</i>	ipv6	tunnel mode ipv6	tunnel mode gre IPv6
<i>interface-type interface-number</i>		IPv4	ipv4 ipv6 IPv6

	-	-
--	---	---

## 43.2

|  
|  
|

|  
|  
|

**show ipv6 general-prefix**

```

Ruijie# show ipv6 interface vlan 1
Interface vlan 1 is Up, ifindex: 2001
address(es):
Mac Address: 00:00:00:00:00:01
INET6: fe80::200:ff:fe00:1 , subnet is fe80::/64
INET6: 2001::1 , subnet is 2001::/64 [TENTATIVE]
Joined group address(es):
ff01:1::1
ff02:1::1
ff02:1::2
ff02:1::1:ff00:1
MTU is 1500 bytes
ICMP error messages limited to one every 10 milliseconds
ICMP redirects are enabled
ND DAD is enabled, number of DAD attempts: 1
ND reachable time is 30000 milliseconds
ND advertised reachable time is 0 milliseconds
ND retransmit interval is 1000 milliseconds
ND advertised retransmit interval is 0 milliseconds
ND router advertisements are sent every 200 seconds<240--160>
ND router advertisements live for 1800 seconds
                                INET6: 2001::1 , subnet is 2001::/64
[TENTATIVE]                INET6                []

```

[TENTATIVE]		INET6	[]
ANYCAST			
TENTATIVE			(DAD)

vlan 1: DOWN

---

total	
fec0:1:1:1::/64	
Def	
Auto   CFG	Auto IPV6 , CFG
!Adv	
vtime	( )
ptime	( )
L   !L	L !L on-link
A   !A	A

1 SVI 1

Ruijie# **show ipv6 neighbors vlan 1**

```
IPv6 Address Linklayer Addr Interface
fa::1          00d0.0000.0002 vlan 1
fe80::200:ff:fe00:2 00d0.0000.0002 vlan 1
```

2

Ruijie# **show ipv6 neighbors verbose**

```
IPv6 Address Linklayer Addr Interface
2001::1       00d0.f800.0001 vlan 1
                State: Reach/H Age: - asked: 0
fe80::200:ff:fe00:1 00d0.f800.0001 vlan 1
                State: Reach/H Age: - asked: 0
```

IPv6 Address	IPV6
Linklayer Addr	Mac incomplete
Interface	

<p>State</p>	<p>state/H(R)</p> <p>STATE</p> <p>INCMP( Incomplete)— (NS) (NA)</p> <p>REACH(Reachable) —</p> <p>STALE —</p> <p>NUD ( Neighbor Unreachability Detection )</p> <p>DELAY— STALE STALE DELAY DELAY_FIRST_PROBE_TIME seconds(5 )</p> <p>DELAY PROBE (NS) NUD</p> <p>PROBE— NUD RetransTimer milliseconds (NS)</p> <p>MAX_UNICAST_SOLICIT(3 )</p> <p>?— /R— /H—</p>
<p>Age</p>	<p>'expired' NUD</p>
<p>Asked</p>	<p>(NS)</p>

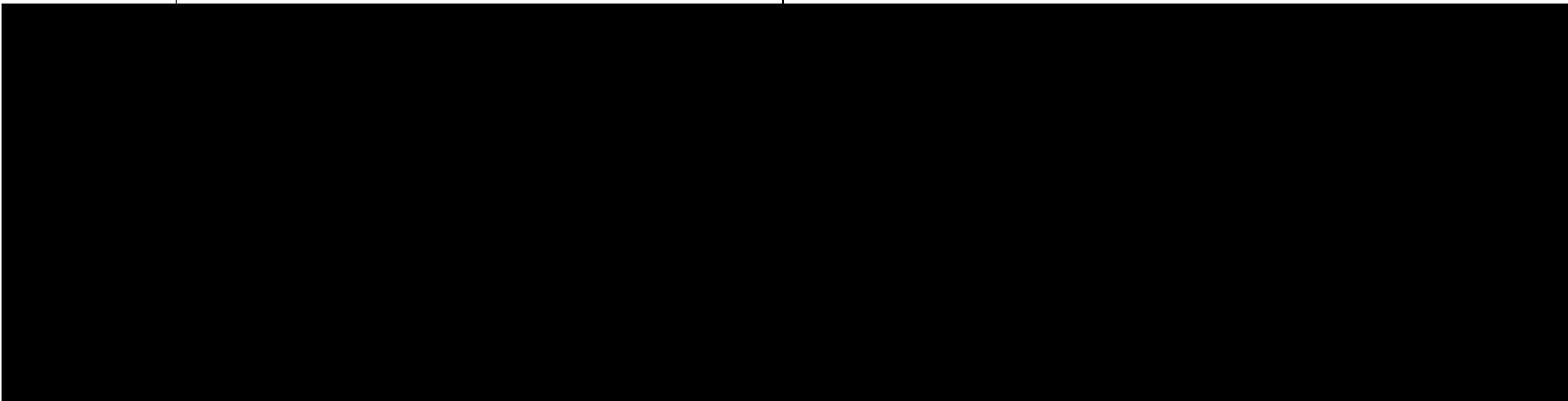
```

3
Ruijie# show ipv6 neighbors static
IPv6 Address    Linklayer Addr  Interface          State
2001:1:::1      00d0.f822.33ab  GigabitEthernet 0/14  ACTIVE
2001:2:::2      00d0.f822.33ac  VLAN 1             INACTIVE

```

IPv6 Address	IPV6
Linklayer Addr	Mac

Interface	



ipv6 neighbor	
---------------	--

-	-

### 43.2.5 show ipv6 route

IPV6

```
show/C2_02>30< 1.5 ref296.7 450.8 0.48 20.1 re6E5C2A<6 450IPV6-1.557 43C325 0 0 10.0.006 Tc 2/0
```

```
L   ::1/128
    via ::1, loopback 0
C   fa::/64
    via ::, vlan 1
L   fa::1/128
    via ::, loopback 0
C   2001::/64
    via ::, vlan 2
L   2001::1/128
    via ::, loopback 0
L   fe80::/10
    via ::1, Null0
C   fe80::/64
    via ::, vlan 1
L   fe80::200:ff:fe00:1/128
    via ::, loopback 0
C   fe80::/64
    via ::, vlan 2
```

!Dv œD •¼" @ à gp mî !r .Ñ» @ !i Â 4y @sBï 4v Nù ð QB2C8 A !56C...€4 )g3ba•W dáAd3be)d3a D\$ bà...!



**ipv6 route**

**show ipv6 router**

**IPv6**

```
Ruijie# show ipv6 router
Router FE80::2D0:F8FF:FEC1:C6E1 on VLAN 2, last update 62 sec
  Hops 64, Lifetime 1800 sec, ManagedFlag=0, OtherFlag=0, MTU=1500
  Preference=MEDIUM
  Reachable time 0 msec, Retransmit time 0 msec
  Prefix 6001:3::/64 onlink autoconfig
    Valid lifetime 2592000 sec, preferred lifetime 604800 sec
  Prefix 6001:2::/64 onlink autoconfig
    Valid lifetime 2592000 sec, preferred lifetime 604800 sec
```

-	-

RGOS10.4	RGOS10.4

# 44 OSPFv3

## 44.1

### 44.1.1 area default-cost

```

stub      ABR      stub
no
area area-id default-cost cost
no area area-id default-cost
    
```

<i>area-id</i>	stub  IPv4
<i>cost</i>	stub 1-16777214

```

default-cost 1
    
```

```

    
```

```

stub      ABR
    
```

```

stub 50      100
ipv6 router ospf 1
area 50 stub
area 50 default-cost 100
    
```

<b>area stub</b>	stub

```

    
```

--	--

	-	-
--	---	---

### 44.1.2 area range

no

**area** *area-id* **range** *ipv6-prefix/prefix-length* [**advertise**|**not-advertise**]

**no area** *area-id* **range** *ipv6-prefix/prefix-length*

<i>area-id</i>	IPv4
<i>ipv6-prefix/prefix-length</i>	
<b>advertise</b>	
<b>not-advertise</b>	

┌

┌

	-

### 44.1.3 area stub

stub
stub
no  
stub

**area *area-id* stub [no-summary]**

**no area *area-id* stub [no-summary]**

┌

<i>area-id</i>	stub  IPv4
<b>no-summary</b>	stub      ABR      ABR 3      3      stub 3      LSA      LSA

┌

┌

stub

area stub
stub
stub
AS  
 (type 5 LSAs)  
 stub  
 OSPFv3  
 stub      ABR      3      LSA

	<b>area default-cost</b>	stub
	-	-

### 44.1.4 area virtual-link

no

**area** *area-id* **virtual-link** *router-id* [**hello-interval** *seconds*] [**dead-interval** *seconds*] [**retransmit-interval** *seconds*] [**transmit-delay** *seconds*] [**instance** *instance-id*]

**no area** *area-id* **virtual-link** *router-id* [**hello-interval**] [**dead-interval**] [**retransmit-interval**] [**transmit-delay**] [**instance**]

<i>area-id</i>		IPv4
<i>router-id</i>		(router-ID)
<b>hello-interval</b> <i>seconds</i>	1-65535	hello
<b>dead-interval</b> <i>seconds</i>	1-65535	
<b>retransmit-interval</b> <i>seconds</i>	1-65535	LSA
<b>transmit-delay</b> <i>seconds</i>	1-65535	LSA
<b>instance</b> <i>instance-id</i>		instance instance
	0-255	

```

hello-interval    10
dead-interval     hello-interval
retransmit-interval 5
transmit-delay    1
    
```

```

OSPFv3
OSPFv3
    
```

```

> stub
r > hello-interval dead-interval
instance
    
```

```

ipv6 router ospf 1
area 1 virtual-link 192.1.1.1
    
```

<b>show ipv6 ospf</b>	OSPFv3
<b>show ipv6 ospf neighbor</b>	OSPFv3
<b>show ipv6 ospf virtual-links</b>	OSPFv3

-	-

### 44.1.5 auto-cost

OSPFv3

no

onoost

<b>reference-bandwidth</b> <i>ref-bw</i>	Mbps 1-4294967

|

|

```

OSPFv3      Hello      OSPFv3      BFD
  FULL      BFD      BFD      BFD
  OSPFv3
      ipv6 ospf bfd [disable]      BFD
      bfd all-interfaces
    
```

|

|

<b>ipv6 router ospf <i>process-id</i></b>	OSPFv3 OSPFv3
<b>ipv6 ospf bfd [disable]</b>	OSPFv3 BFD

|

|

-	-

### 44.1.7 clear ipv6 ospf process

OSPFv3

**clear ipv6 ospf [*process-id*] process**

|

--	--

*process-id*

OSPFv3

1-65535 0 0 13.98 62.30[ 0 9 10C556

```

                                OSPFv3
enable
clear ipv6 ospf process
    
```

-	-

```

    
```

-	-

### 44.1.8 default-information originate

```

                                OSPFv3                                default-information
originate                                no
default-information originate [always] [metric metric] [metric-type type] [route-map
map-name]
no default-information originate [always] [metric] [metric-type type] [route-map
map-name]
    
```

<b>always</b>	OSPFv3
<b>metric -D</b>	

```

redistribute default-information OSPFv3
ASBR
redistribute OSPFv3
ASBR default-information originate
always OSPFv3
show ipv6 ospf database OSPFv3 OSPFv3
show ipv6 route
default-information originate
default-metric
OSPFv3 1 2 1
2 show ipv6 route 1
stub

```

```
default-information originate always
```

<b>redistribute</b>	
<b>show ipv6 ospf</b>	OSPFv3
<b>show ipv6 ospf database</b>	OSPFv3

-	-

### 44.1.9 default-metric

**no**

**default-metric** *metric-value*

**no default-metric**

<i>metric-value</i>	1-16777214

20

```

redistribute
> default-information originate
>

```

```

metric 10
default-metric 10

```

<b>redistribute</b>	
<b>show ipv6 ospf</b>	OSPFv3

-	-

### 44.1.10 distance

OSPFv3

no

**distance** { *distance* | **ospf** { *intra-area distance* | *inter-area distance* | **external distance** } }

**no distance** [**ospf**]

<i>distance</i>	1-255
<b>intra-area distance</b>	1-255
<b>inter-area distance</b>	1-255
<b>external distance</b>	1-255

```

110
110
110
110
    
```

```

OSPFv3
-----
> OSPFv3
r
> 255
    
```

```

OSPFv3 160
Ruijie(config)# ipv6 router ospf 20
Ruijie(config-router)# distance ospf external 160
    
```

<b>ipv6 router ospf</b>	OSPFv3

-	-

### 44.1.11 ipv6 ospf area

```

OSPFv3 no
ipv6 ospf process-id area area-id [instance instance-id]
no ipv6 ospf process-id area [instance instance-id]
    
```

<i>process-id</i>	ospf 1-65535
<b>area area-id</b>	OSPFv3 IPv4

## OSPFv3

<b>instance</b> <i>instance-id</i>	OSPFv3 0-255
------------------------------------	-----------------

┌  
└

┌  
└

		OSPFv3	<b>ipv6 router ospf</b>
OSPFv3	OSPFv3		
<b>no ipv6 ospf area</b>		OSPFv3	
<b>no ipv6 router ospf</b>		OSPFv3	
<i>instance-id</i>			
		OSPFv3	

int fastethernet 0/0      OSPFv3

```
int fastethernet 0/0
[REDACTED] area 2 instance 2
```

[REDACTED]

disable	OSPF	BFD
instance <i>instance-id</i>	OSPFv3 0-255	

OSPFv3	BFD
--------	-----

<b>bfd all-interfaces</b>	
<b>ipv6 ospf bfd</b>	BFD
OSPFv3	<b>bfd all-interfaces</b>
BFD	OSPFv3
BFD	<b>ipv6 ospf bfd disable</b>

<b>ipv6 router ospf <i>process-id</i></b>	OSPFv3 OSPFv3
<b>bfd all-interfaces</b>	OSPFv3 BFD

-	-
---	---

### 44.1.13 ipv6 ospf cost

no

**ipv6 ospf cost *cost* [instance *instance-id*]**

**no ipv6 ospf cost [instance *instance-id*]**

<i>cost</i>
-------------

---

---

3#Å

Y@B @Ñ-p8...C

1 we=oaDX\$Dif&N#2Sd' "ãhD"ND5eA2 !-RBb dRsd!r"

---

GÄ@ CÄE7B

yAA !56)1Vbc (@HDB)ZBBi(7bvB2(&T8)g(AE èrh#196#BHDHò4!9 0U2K#T!—p=@äQ!QñhAÐ0  
0aDVAaUN65BAn24-07©eCT#15E1T0b)hR)q9BN45VÄ@)bEÄ

---

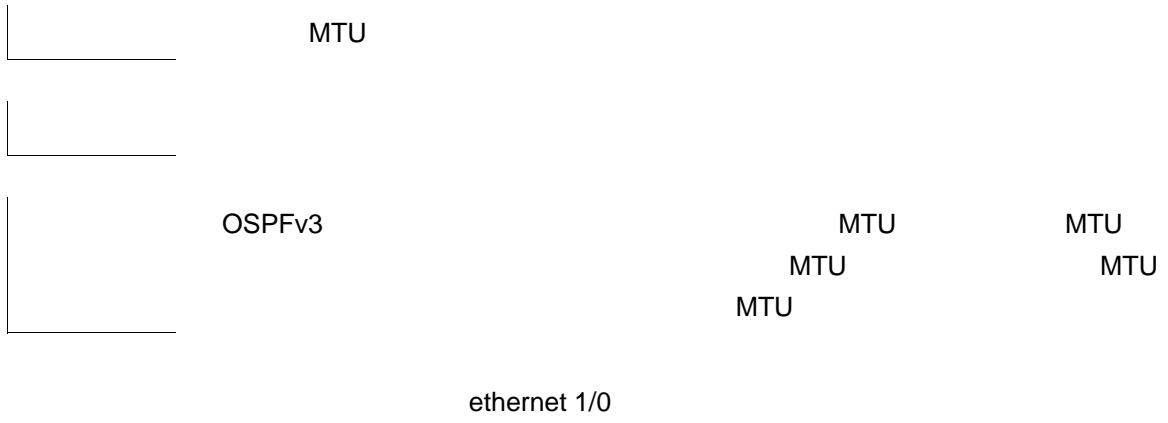
) "R&VSVÄ"/!

---

## OSPFv3

---

<b>instance</b> <i>instance-id</i>	OSPFv3	0-255
<b>ipv6 ospf hello-interval</b> 4		
	hello 4	hello
>	hello	
>		
<b>ipv6 ospf dead-interval</b> 60	60s	



|

Hello

|

hello

20s

ipv6 ospf hello-interval 20

|



**ipv6 ospf dead-interval**

120  
0

OSPFv3 IPv6 2001:DB8:4::1 1  
150

```
Ruijie(config)# interface fastEthernet 0/1
Ruijie(config-if)# ipv6 ospf neighbor 2001:DB8:4::1 priority 1
poll-interval 150
```

ipv6 ospf priority	
ipv6 ospf network	

-	-

### 44.1.18 ipv6 ospf network

no

**ipv6 ospf network** {broadcast | non-broadcast | point-to-point | point-to-multipoint [non-broadcast]} [instance *instance-id*]

**no ipv6 ospf network** [broadcast | non-broadcast | point-to-point | point-to-multipoint [non-broadcast]] [instance *instance-id*]



<b>point-to-multipoint non-broadcast</b>	
<b>instance</b> <i>instance-id</i>	OSPFv3 0-255

┌

┌

┌

OSPFv3  
ipv6 ospf network point-to-point

<b>ipv6 ospf priority</b>	
<b>show ipv6 ospf interface</b>	OSPFv3
<b>ipv6 ospf area</b>	OSPFv3

┌

-	-

### 44.1.19 ipv6 ospf priority

**no**

**ipv6 ospf priority** *number-value* [**instance** *instance-id*]

**no ipv6 ospf priority** [**instance** *instance-id*]

<i>number-value</i>	0-255
<b>instance</b> <i>instance-id</i>	OSPFv3 0-255

┌ 1

OSPFv3

---

|

---

|

---

DR/BDR( / ) DR/BDR  
DR BDR Router-ID  
DR BDR  
DR/BDR  
DR BDR  
DR BDR

|

---

0 1 Tf 2 Trd 108 0 T222 0 1.659 22 021 pw [  
ipv6 ospf priority 0

┌

┌ LSA

┌ LSA 10s  
 ipv6 ospf retransmit-interval 10

┌

<b>show ipv6 ospf interface</b>	OSPFv3
<b>ipv6 ospf area</b>	OSPFv3

┌

┌

-	-

### 44.1.21 ipv6 ospf transmit-delay

┌ LSA

no

**ipv6 ospf transmit-delay** *seconds* [**instance** *instance-id*]

**no ipv6 ospf transmit-delay** [**instance** *instance-id*]

┌

<i>seconds</i>	LSA 1-65535( )
<b>instance</b> <i>instance-id</i>	OSPFv3 0-255

┌ 1s

┌

┌ LSA

┌ LSA

```
ipv6 ospf transmit-delay 2
```

<b>show ipv6 ospf interface</b>	OSPFv3

-	-

### 44.1.22 ipv6 router ospf

```

OSPFv3                no        OSPFv3
ipv6 router ospf [process-id]
no ipv6 router ospf process-id

```

<i>process-id</i>	OSPFv3 1

```
OSPFv3
```

```

OSPFv3
32 OSPFv3

```

```

OSPFv3
ipv6 router ospf 1

```

<b>ipv6 ospf area</b>	OSPFv3
<b>show ipv6 ospf</b>	OSPFv3

--	--



OSPFv3

---

	<i>number</i>	DD 1-65535
--	---------------	---------------

5

OSPFv3

DD

max-concurrent-dd

4

4

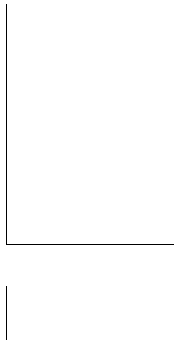
DD

	hello
OSPFv3	
VLAN1	OSPFv3
passive-interface default	
no passive-interface vlan 1	
<b>ipv6 ospf area</b>	OSPFv3
<b>show ipv6 ospf</b>	OSPFv3
<b>show ipv6 ospf neighbor</b>	OSPFv3
-	-

### 44.1.26 redistribute

	OSPFv3
no	
<b>redistribute {bgp   connected   isis [area-tag]   ospf process-id   rip   static} [{level-1   level-1-2   level-2}   match {internal   external [1 2]}   metric metric-value   metric-type {1 2}   route-map route-map-name   tag tag-value]</b>	
<b>no redistribute {bgp   connected   isis [area-tag]   ospf process-id   rip   static} [{level-1   level-1-2   level-2}   match {internal   external [1 2]}   metric   metric-type {1 2}   route-map route-map-name   tag tag-value]</b>	
<b>bgp</b>	bgp
<b>connected</b>	
<b>isis [area-tag]</b>	isis                      area-tag                      isis
<b>ospf process-id</b>	ospf                      process-id                      ospf 1-65535
<b>rip</b>	rip
<b>static</b>	

<b>level-1   level-1-2   level-2</b>	IS-IS level
<b>match</b>	OSPFv3 internal external [1 2] E1 E2
<b>metric</b> <i>metric-value</i>	OSPFv3 external 2 LSA metric metric-value metric 0-16777214
<b>metric-type</b> {1 2}	E-1 E-2
<b>route-map</b> <i>route-map-name</i>	map-tag 32
<b>tag</b> <i>tag-value</i>	OSPFv3 tag 0-4294967295



ISIS level-1 level-2 level-1-2  
ISIS



		OSPFv3	
	Router ID	OSPFv3	OSPFv3
	router-id 1.1.1.1	OSPFv3	1.1.1.1
	<b>ipv6 ospf priority</b>		
	<b>show ipv6 ospf</b>		OSPFv3

---



```

1 RGOS 10.4 timers throttle spf
  timers spf 5 10
2 RGOS 10.4 timers throttle spf timers spf
  SPF timers throttle spf timers
throttle spf
  
```

```

spf-delay spf-holdtime OSPF
CPU
r timers spf timers throttle spf
  
```

```

OSPFv3 3 9
Ruijie(config)# ipv6 router ospf 20
Ruijie(config-router)# timers spf 3 9
  
```

<b>clear ipv6 ospf</b>	OSPFv3
<b>show ipv6 ospf</b>	OSPFv3
<b>timers throttle spf</b>	SPF

-	-

### 44.1.30 timers throttle spf

```

OSPFv3 SPF SPF
timers throttle spf no
  
```

```

timers throttle spf spf-delay spf-holdtime spf-max-waittime
no timers throttle spf
  
```

<i>spf-delay</i>	SPF 1-600000 OSPFv3 GD: <i>spf-delay</i>
<i>spf-holdtime</i>	SPF 1-600000
<i>spf-max-waittime</i>	SPF 1-600000

spf-delay 1000  
 spf-holdtime 5000  
 spf-max-waittime 10000



Number of AS-Scoped Unknown LSA 0  
Number of LSA originated 11  
Number of LSA received 4  
Log Neighbor Adjacency Changes : Enabled  
Number of areas in this router is 2  
Area BACKBONE(0)  
Number of interfaces in this area is 1(1)  
SPF algorithm executed 4 times

	<b>timers spf</b>	OSPFv3 SPF SPF
	-	-

### 44.2.2 show ipv6 ospf database

OSPFv3

**show ipv6 ospf** [*process- id*] **database** [*lsa-type* [**adv-router** *router-id* ]]

<i>process- id</i>		OSPFv3
<i>lsa-type</i>		LSA AS-external-LSAs Link-LSAs Inter-Area-Prefix-LSAs Inter-Area-Router-LSAs Intra-Area-Prefix-LSAs Network-LSAs Router-LSAs LSA
<b>adv-router</b> <i>router-id</i>		router LSA

OSPFv3

Ruijie# **show ipv6 ospf database**

OSPFv3 Router with ID (1.1.1.1) (Process 1)

Link-LSA (Interface FastEthernet 1/0)

Link State ID	ADV Router	Age	Seq#	CkSum	Prefix
0.0.0.2	1.1.1.1	197	0x80000001	0x7cd8	0
0.0.0.5	2.2.2.2	206	0x80000001	0x8c86	0

```

Link-LSA (Interface Loopback 1)
Link State ID  ADV Router      Age  Seq#      CkSum  Prefix
0.0.64.1      1.1.1.1      82  0x80000001 0xb760  0
Router-LSA (Area 0.0.0.0)
Link State ID  ADV Router      Age  Seq#      CkSum  Link
0.0.0.0      1.1.1.1      17  0x80000006 0x62a1  1
0.0.0.0      2.2.2.2      156 0x80000003 0x8653  1
Network-LSA (Area 0.0.0.0)
Link State ID  ADV Router      Age  Seq#      CkSum
0.0.0.5      2.2.2.2      157 0x80000001 0xf8f6
Router-LSA (Area 0.0.0.1)
Link State ID  ADV Router      Age  Seq#      CkSum  Link
0.0.0.0      1.1.1.1      17  0x80000002 0x0529  0
Inter-Area-Prefix-LSA (Area 0.0.0.1)
Link State ID  ADV Router      Age  Seq#      CkSum
0.0.0.1      1.1.1.1      77  0x80000002 0x83b4
AS-external-LSA
Link State ID  ADV Router      Age  Seq#      CkSum
0.0.0.1      1.1.1.1      1  0x80000001 0x6035 E2
    
```

<b>ipv6 router ospf</b>	OSPFv3

-	-

### 44.2.3 show ipv6 ospf interface

OSPFv3

**show ipv6 ospf interface** [*interface-type interface-number*]

<i>interface-type interface-number</i>	

## OSPFv3

```
Ruijie# show ipv6 ospf interface
FastEthernet 1/0 is up, line protocol is up
Interface ID 2
IPv6 Prefixes
fe80::2d0:22ff:fe22:2223/64 (Link-Local Address)
OSPFv3 Process (1), Area 0.0.0.0, Instance ID 0
Router ID 1.1.1.1, Network Type BROADCAST, Cost: 1
Transmit Delay is 1 sec, State BDR, Priority 1
Designated Router (ID) 2.2.2.2
Interface Address fe80::c800:eff:fe84:1c
Backup Designated Router (ID) 1.1.1.1
Interface Address fe80::2d0:22ff:fe22:2223
Timer interval configured,Hello 10,Dead 40,Wait 40,Retransmit 5
Hello due in 00:00:02
Neighbor Count is 1, Adjacent neighbor count is 1
Hello received 26 sent 26, DD received 5 sent 4
LS-Req received 1 sent 1, LS-Upd received 3 sent 6
LS-Ack received 6 sent 2, Discarded 0
                                BFD , BFD enabled
```

```
Ruijie# show ipv6 ospf interface
FastEthernet 1/0 is up, line protocol is up
Interface ID 2
IPv6 Prefixes
fe80::2d0:22ff:fe22:2223/64 (Link-Local Address)
OSPFv3 Process (1), Area 0.0.0.0, Instance ID 0
Router ID 1.1.1.1, Network Type BROADCAST, Cost: 1
Transmit Delay is 1 sec, State BDR, Priority 1 BFD enabled
Designated Router (ID) 2.2.2.2
Interface Address fe80::c800:eff:fe84:1c
Backup Designated Router (ID) 1.1.1.1
Interface Address fe80::2d0:22ff:fe22:2223
Timer interval configured,Hello 10,Dead 40,Wait 40,Retransmit 5
```

```

Hello due in 00:00:02
Neighbor Count is 1, Adjacent neighbor count is 1
Hello received 26 sent 26, DD received 5 sent 4
LS-Req received 1 sent 1, LS-Upd received 3 sent 6
LS-Ack received 6 sent 2, Discarded 0
    
```

<b>ipv6 router ospf</b>	OSPFv3
<b>ipv6 ospf area</b>	OSPFv3

-	-

#### 44.2.4 show ipv6 ospf neighbor

OSPFv3

**show ipv6 ospf** [*process-id*] **neighbor** [*interface-type interface-number* [**detail**]] [*neighbor-id* [**detail**]]

<i>process-id</i>	OSPFv3
<b>detail</b>	
<i>interface-type interface-number</i>	
<i>neighbor-id</i>	Router ID

```

1 OSPFv3
Ruijie# show ipv6 ospf neighbor
OSPFv3 Process (1) , 1 Neighbors, 1 is Full:
    
```

```
Neighbor ID Pri State Dead Time Interface Instance ID
2.2.2.2 1 Full/DR 00:00:33 FastEthernet 1/0 0
2 OSPFv3
```

Ruijie# **show ipv6 ospf neighbor detail**

```
Neighbor 2.2.2.2, interface address fe80::c800:eff:fe84:1c
In the area 0.0.0.0 via interface FastEthernet 1/0
Neighbor priority is 1, State is Full, 6 state changes
DR is 2.2.2.2 BDR is 1.1.1.1
Options is 0x000013 (-|R|-|-|E|V6)
Dead timer due in 00:00:36
Database Summary List 0
Link State Request List 0
Link State Retransmission List 0
```

BFD

BFD

**session state up**

Ruijie# **show ipv6 ospf neighbor detail**

```
Neighbor 2.2.2.2, interface address fe80::c800:eff:fe84:1c
In the area 0.0.0.0 via interface FastEthernet 1/0
Neighbor priority is 1, State is Full, 6 state changes
DR is 2.2.2.2 BDR is 1.1.1.1
Options is 0x000013 (-|R|-|-|E|V6)
Dead timer due in 00:00:36
Database Summary List 0
Link State Request List 0
Link State Retransmission List 0
BFD session state up
```

<b>ipv6 router ospf</b>	OSPFv3
<b>ipv6 ospf area</b>	
<b>area virtual-link</b>	OSPFv3
<b>show ipv6 ospf interface</b>	OSPFv3

-	-

## 44.2.5 show ipv6 ospf route

OSPFv3

**show ipv6 ospf [process- id] route [count]**

<i>process- id</i>	OSPFv3
<b>count</b>	OSPFv3

|

|

|

```

                                OSPFv3
Ruijie# show ipv6 ospf route
OSPFv3 Process (1)
Codes: C - connected, D - Discard, O - OSPF, IA - OSPF inter area,
E1 - OSPF external type 1, E2 - OSPF external type 2
Destination                                Metric
Next-hop
E2 2001:DB8:1::/64                          1/20
via fe80::c800:eff:fe84:1c, FastEthernet 1/0
O 2001:DB8:2::/64                            11
via fe80::c800:eff:fe84:1c, FastEthernet 1/0, Area 0.0.0.0

```

--	--

OSPFv3

**show ipv6 ospf [*process-id*] summary-prefix**

<i>process- id</i>	OSPFv3

|

|

|

OSPFv3

Ruijie# **show ipv6 ospf summary-prefix**

OSPFv3 Process 1, Summary-prefix:

2001:db8::/64, Metric 16777215, Type0, Tag0, Match count0, advertise

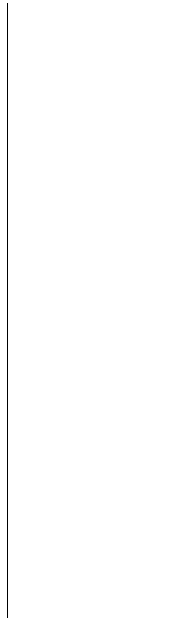
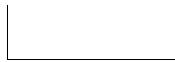
<b>ipv6 router ospf</b>	OSPFv3
<b>summary-prefix</b>	OSPFv3

|

-	-

**44.2.7 show ipv6 ospf topology**

OSPFv3 \$ . ~ ! r



OSPFv3

```
Ruijie# show ipv6 ospf topology
OSPFv3 Process (1)
OSPFv3 paths to Area (0.0.0.0) routers
Router ID      Bits  Metric  Next-Hop
Interface
1.1.1.1        EB  --
2.2.2.2        E   1       2.2.2.2
FastEthernet 1/0
OSPFv3 paths to Area (0.0.0.1) routers
Router ID      Bits  Metric  Next-Hop
Interface
1.1.1.1        B   --
```

<b>ipv6 router ospf</b>	OSPFv3
<b>area range</b>	OSPFv3



-	-

### 44.2.8 show ipv6 ospf virtual-links

OSPFv3

**show ipv6 ospf [*process- id*] virtual-links**



<i>process- id</i>	OSPFv3



OSPFv3

```
Ruijie# show ipv6 ospf virtual-links
Virtual Link VLINK1 to router 2.2.2.2 is down
Transit area 0.0.0.1 via interface FastEthernet 1/0, instance ID 0
Local address *
Remote address 2001:DB8::1/128
Transmit Delay is 1 sec, State Down,
Timer intervals configured,Hello 10,Dead 40,Wait 40,Retransmit 5
Hello due in inactive
Adjacency state Down
```

<b>ipv6 router ospf</b>	OSPFv3
<b>area virtual-link</b>	OSPFv3
<b>show ipv6 ospf neighbor</b>	OSPFv3

-	-

**45**



0 T)-12(unnee31A>.540 10.0 T) su. 00 2 4 1 0 R G 0 5 6 0 2 8 T) T 0 0 T) 4 B 4 n c) R E B T / 2 2 2 / 0 E \_ 0 H H 2 8 1 0 7 1 0 0 H B 0 7 0 5 A T 0 1 . B 0 3 7 0

10.4	RGOS 10.4	10.4 1

### 45.1.3 tunnel checksum

no                      **tunnel checksum**                      tunnel

**tunnel checksum**

**no tunnel checksum**

-		-

┌

┌

GRE

## **45.1.4 tunnel destination**

## Tunnel

---

<i>value</i>	hi bbY`	\$! (& (- * +&(-
--------------	---------	------------------

|

|

|

|

**tunnel key** GRE

1 tunnel 0 1234

Ruijie(config)# **interface tunnel 0**

Ruijie(config-if)# **tunnel key 1234**

┌

Tunnel Tunnel Tunnel GRE  
Tunnel  
IP GRE

```

1 tunnel 0 GRE IP
Ruijie(config)# interface tunnel 0
Ruijie(config-if)# tunnel mode gre ip
    
```

<b>show interface tunnel</b>	tunnel
------------------------------	--------

┌

-	-
---	---

### 45.1.7 tunnel path-mtu-discovery

**tunnel path-mtu-discovery** PMTUD  
no

**tunnel path-mtu-discovery** [**age-timer** {aging-mins | infinite } |

**min-mtu** mtu-bytes]

**no tunnel path-mtu-discovery**

<i>age-timer</i>	AH AH U[ ]b[! a]bg %\$! '\$ %\$ ] bZ] b] hY AH
<i>min-mtu</i>	DAH 8 AH
<i>mtu-bytes</i>	AH - & * ) ) - &

IP PMTUD

┌

```

                                MTU
                                RGNOS
                                PMTU
                                tunnel
    IP      DF Don't Fragment
tunnel path-mtu-discovery
    mtu
        10.4 2
    
```

┌

```

    1 tunnel 0      PMTUD
Ruijie(config)# interface tunnel 0
Ruijie(config-if)# tunnel path-mtu-discovery
    
```

┌

<b>show interface tunnel</b>	tunnel

┌

┌

10.4	10.4 2

### 45.1.8 tunnel path-mtu-discovery

```

                                tunnel path-mtu-discovery      PMTUD
                                no
tunnel path-mtu-discovery aging-mins mtu-bytes
no tunnel path-mtu-discovery
    
```

┌

<i>age-timer</i>	AH
<i>min-mtu</i>	AH
	DAH 8 AH
	- & % \$\$

┌

┌

```

    IP      PMTUD
    
```



```


```

```

    tunnel

```

```

    1 tunnel 0 tunnel source 1/0
Ruijie(config)# interface tunnel 0
Ruijie(config-if)# tunnel source serial 1/0

```

<b>show interface tunnel</b>	tunnel

```


```

```

-

```

-	-

### 45.1.10 tunnel tos

tunnel IPv4 ToS IPv6 traffic class 8

**tunnel tos [num]**

**no tunnel tos**

```


```

<i>num</i>	=Dj ( HcG =Dj * hfUZZ] WWUgg , \$ &))

IPv4 IPv4 tos IPv6 IPv6  
 IPv4 traffic class8 é IPv6 IPv6

```

1 interface tunnel 1 GRE          ToS      20
00010100
Ruijie(config)# interface tunnel 1
Ruijie(config)# tunnel tos 20
    
```

<b>show interface tunnel</b>	tunnel

10.4	RGOS 10.4
	10.4 2

### 45.1.11 tunnel ttl

	<b>show interface tunnel</b>	tunnel
	-	-

### 45.1.12 tunnel vrf

IPv4 VRF

**tunnel vrf** [*vrf-name*]

**no tunnel vrf**

	<i>vrf-name</i>	IPv4 VRF

10.4

RGOS 10.4

10.4 2



	-	-

### 46.1.2 distance IPv6

RIPng

**distance**

**distribute-list prefix-list** *prefix-list-name* {**in** | **out**} [*interface-type interface-name*]

**no distribute-list prefix-list** *prefix-list-name* {**in** | **out**} [*interface-type interface-name*]

<b>prefix-list</b> <i>prefix-list-name</i>	<b>prefix-list</b>
<b>in</b>   <b>out</b>	
<i>interface-type interface-name</i>	

---

---

---

---

<b>originate</b>	ipv6
<b>metric</b> <i>metric-value</i>	1-15





	-	-
--	---	---

### 46.1.8 passive-interface RIPng

**no** **passive-interface**

**passive-interface** {**default** | *interface-type interface-num*}

**no passive-interface** {**default** | *interface-type interface-num*}

<b>default</b>		passive
<i>interface-type interface-num</i>		

passive

**passive-interface default** passive **no**  
**passive-interface** *intface-type interface-num* passive

passive ethernet0/0 passive

Ruijie(config-router)# **passive-interface default**  
Ruijie(config-router)# **no passive-interface ethernet 0/0**

-		-

-		-

### 46.1.9 redistribute

**no** RIPng **redistribute**

**redistribute** {**bgp** | **connected** | **isis** [*area-tag*] | **ospf** *process-id* | **static**} [**metric** *metric-value* | **route-map** *route-map-name*]

**no redistribute** {**bgp** | **connected** | **isis** [*area-tag*] | **ospf** *process-id* | **static**} [**metric** *metric-value* | **route-map** *route-map-name*]

<b>bgp</b>	BGP		
<b>connected</b>			
<b>isis</b> [ <i>area-tag</i> ]	ISIS	<i>area-tag</i>	ISIS
<b>ospf</b> <i>process-id</i>	OSPF	<i>process-id</i>	ospf
<b>static</b>		1-65535	
<b>metric</b> <i>metric-value</i>			RIPng
<b>route-map</b> <i>route-map-name</i>			

**default-metric** **metric** 1  
**route-map**

RIPng



### 46.1.11 timers (ipv6)

RIPng	timers	no
<i>timers update invalid flush</i>		
<i>no timers</i>		
<i>update</i>	update 30	invalid flush
<i>invalid</i>	invalid invalid 180	invalid
<i>flush</i>	flush flush	RIPng invalid 120

30                      180                      120

```

RIPng
RIPng
r
show ipv6 rip
2Mbps

```

```

RIP      10      30
invalid  invalid  90

Ruijie(config)# ipv6 router rip
Ruijie(config-router)# timers 10 30 90

```

<b>show ipv6 rip</b>	RIPng
<b>show ipv6 rip database</b>	RIPng

└───┘

-	- 29/C2_0

└───┘

└───┘

└───┘

└───┘

```
Ruijie#          rip
Routing          Protocol          is          "RIPng"
```

```

    Redistributing protocol connected route-map rm
    Redistributing protocol static
    Redistributing protocol ospf 1
    Default version control: send version 1, receive version 1
    Interface          Send  Recv
    VLAN 1             1    1
    Loopback 1         1    1
    Routing Information Sources:
    None
  
```

<b>show ipv6 rip</b>	RIPng

└──

-	-

### 46.2.2 show ipv6 rip database

RIPng	<b>show ipv6 rip database</b>
<b>show ipv6 rip database</b>	
-	-

└──

└──

RIPng

```

Ruijie# show ipv6 rip database
Codes: R - RIPng,C - Connected,S - Static,O - OSPF,B - BGP
sub-codes:n - normal,s - static,d - default,r - redistribute,
          i - interface, a/s - aggregated/suppressed
  
```

└──

```

S(r) 2001:db8:1::/64, metric 1, tag 0
      Loopback 0/::
S(r) 2001:db8:2::/64, metric 1, tag 0
      Loopback 0/::
C(r) 2001:db8:3::/64, metric 1, tag 0
      VLAN 1/::
S(r) 2001:db8:4::/64, metric 1, tag 0
      Null 0/::
C(i) 2001:db8:5::/64, metric 1, tag 0
      Loopback 1/::
S(r) 2001:db8:6::/64, metric 1, tag 0
      Null 0/::
    
```

<b>show ipv6 rip</b>	RIPng

-	-

# 47 IPv6

## 47.1 IPv6

### 47.1.1 clear ipv6 mroute

IPv6

```
clear ipv6 mroute {* | v6group-address [v6source -address]}
```

*	IPv6	
v6group-address	IPv6	IPv6
v6source -address	IPv6	IPv6

```


```

```


```

```


```

IPv6

```


```

```
Ruijie# clear ipv6 mroute *
```

show ipv6 mroute	-
clear ipv6 mroute statistics	-

```


```

-	-

### 47.1.2 clear ipv6 mroute statistics

IPv6



<i>v6rpf-address</i>	v6source-address	ipv6
<i>interface-type</i> <i>interface-number</i>		
<i>distance</i>	0	RPF



IPv6

IPv6

IPv6

rpf

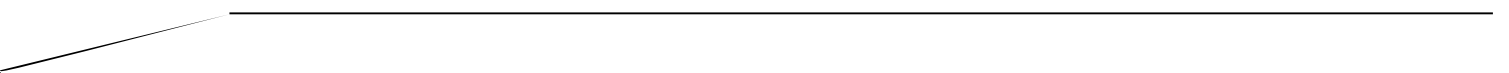
rpf

ip

bgp

rpf IPv

IPv6



```
limit 1024
threshold 2147483647
```

IPv6

r

```
IPv6 100 90
Ruijie(config)# ipv6 multicast route-limit 100 90
```

-	-

-	-

### 47.1.6 ipv6 multicast-routing

```
IPv6 no IPv6
ipv6 multicast-routing
no ipv6 multicast-routing
```

-	-

IPv6

IPv6

IPv6

r

```

(2222::3333 ff66::100) GigabitEthernet 2/6
FastEthernet 3/2
Ruijie(config)# ipv6 multicast static 2222::3333 ff66::100 G2/6
Ruijie(config)# ipv6 multicast static 2222::3333 ff66::100 F3/2
    
```

-	-

-	-

### 47.1.8 ipv6 multicast rpf longest-match

```

FD:          A6; D          FD:
      A6; D
      MBGP
      no
      MBGP
    
```

**ipv6 multicast rpf longest-match**

**no ipv6 multicast rpf longest-match**


```

FD:          A6; D          FD:
      A6; D
      MBGP
    
```

```

┌
└
┌
└
    
```

```
Ruijie(config)# ipv6 multicast rpf longest-match
```

-	-

-	10.4 2

## 47.2 IPv6

### 47.2.1 show ipv6 mroute

IPv6

```
show ipv6 mroute [ v6group-address] [v6source-address] [summary] [count]
```

<i>v6group-address</i>	IPv6
<i>v6source-address</i>	IPv6
<b>summary</b>	IPv6
<b>count</b>	IPv6

IPv6

1

```
Ruijie# show ipv6 mroute
```

```
IPv6 Multicast Routing Table
```

```
Flags: I - Immediate Stat, T - Timed Stat, F - Forwarder installed
```

```
Timers: Uptime/Stat Expiry
```

```
Interface State: Interface (TTL)
```

(2222::1234, ff56::1234), uptime 00:00:31, stat expires 00:02:59

Owner PIM-SMv6, Flags: TF

Incoming interface: FastEthernet 2/1

Outgoing interface list:

FastEthernet 1/3

2

Ruijie# **show ipv6 mroute count**

IPv6 Multicast Statistics

Total 1 routes using 168 bytes memory

Route limit/Route threshold: 1024/2147483647

Total NOCACHE/WRONGVIF/WHOLEPKT rcv from fwd: 77/147/0

Total NOCACHE/WRONGVIF/WHOLEPKT sent to clients: 77/147/0

Immediate/Timed stat updates sent to clients: 0/29

Reg ACK rcv/Reg NACK rcv/Reg pkt sent: 0/0/0

Next stats poll: 00:00:09

Forwarding Counts: Pkt count/Byte count, Other Counts: Wrong If pkts

Fwd msg counts: WRONGVIF/WHOLEPKT rcv

Client msg counts: WRONGVIF/WHOLEPKT/Imm Stat/Timed Stat sent

Reg pkt counts: Reg ACK rcv/Reg NACK rcv/Reg pkt sent

(2222::1234, ff56::1234), Forwarding: 1/0, Other: 0

Fwd msg: 0/0, Client msg: 0/0/0/0, Reg: 0/0/0

3

Ruijie# **show ipv6 mroute summary**

IPv6 Multicast Routing Table

Flags: I - Immediate Stat, T - Timed Stat, F - Forwarder installed

Timers: Uptime/Stat Expiry

Interface State: Interface (TTL)

(2222::1234, ff56::1234), 00:00:28/00:03:25, PIM-SMv6, Flags: TF

<b>clear ipv6 mroute</b>	-
<b>clear ipv6 mroute statistics</b>	-

## 47.2.2 show ipv6 rpf

IPv6 RPF

**show ipv6 rpf v6source-address**

	IPv6	RPF
<i>v6group-address</i>	IPv6	IPv6

|

|

|

IPv6 RPF

2222::3333 RPF

Ruijie# **show ipv6 rpf 2222::3333**

RPF interface: GigabitEthernet 0/1

RPF neighbor: ::

RPF route: 2222::/64

RPF type: unicast (connected)

RPF recursion count: 0

Doing distance-preferred lookups across tables

Distance: 0

Metric: 0

--	--	--



```

svi1
Ruijie#show ipv6 mvif
Interface          Mif  Owner          Uptime
                   Idx  Module
Register          0
VLAN 1            1    PIMSMV6        03d03h09m
    
```

-	-

-	-

## 47.3 IPv6

### 47.3.1 debug nsm mcast6 all

IPv6

no

IPv6

**debug nsm mcast6 all**

-	-

IPv6

```
Ruijie# debug nsm mcast6 all
```

	-	-
	-	-

### 47.3.2 debug nsm mcast6 fib-msg

IPv6

no

#### debug nsm mcast6 fib-msg

	-	-

IPv6

IPv6  
Ruijie#

`debug nsm mcast6 fib-msg`

	-	-

	-	-

### 47.3.3 debug nsm mcast6 register

IPv6

no

**debug nsm mcast6 register**





	-	-

# 48 PIM-SMv6

## 48.1 PIM-SMv6

### 48.1.1 clear ipv6 mroute

**clear ipv6 mroute** { \* | ipv6\_group\_address | ipv6\_group\_address ipv6\_source\_address }

*	
<i>ipv6_group_address</i>	
<i>ipv6_group_address</i> <i>ipv6_source_address</i>	

┌

┌

┌

```
Ruijie# clear ipv6 mroute *
Ruijie# clear ipv6 mroute ff66::6666
Ruijie# clear ipv6 mroute ff66::6666 3333::3333
```

-	-

┌

-	-

### 48.1.2 clear ipv6 mroute statistics

**clear ipv6 mroute statistics** { \* | *ipv6\_group\_address* [*ipv6\_source\_address*] }



RP

```
Ruijie# clear ipv6 pim sparse-mode bsr rp-set *
```



**ipv6 multicast-routing**

	-	-
	IPv6	
	IPv6	PIM-SMv6 PIM-SMv6
	<b>ipv6 pim sparse-mode</b>	
	Ruijie(config)# <b>ipv6 multicast-routing</b>	
	-	-
	-	-

**48.1.6 ipv6 pim accept-bsr list**

**ipv6 pim accept-bsr list WORD**

	<i>WORD</i>	v6 acl
	PIM-SMv6	BSM
	PIM-SMv6	BSR
	Ruijie# <b>configure terminal</b>	
	Ruijie(config)# <b>ipv6 pim accept-bsr list bsr-list</b>	

	-	-
	-	-

### 48.1.7 ipv6 pim accept-crp list

**ipv6 pim accept-crp list** *WORD*

	<i>WORD</i>	v6 acl		
	BSR	RP		
	BSR	BSR	BSR	C-RP
	Ruijie# <b>configure terminal</b>			
	Ruijie(config)# <b>ipv6 pim accept-crp list</b> <i>crp-list</i>			
	-	-		
	-	-		

### 48.1.8 ipv6 pim accept-crp-with-null-group

**ipv6 pim accept-crp-with-null-group**

-		-

BSR      prefix-count    0    C-RP-ADV

BSR                                  BSR                  BSR

```
Ruijie(config)# ipv6 pim accept-register list register-access-list
Ruijie(config)# ipv6 access-list register-access-list
                        fe80::2d0:f8ff:fe22:33ad
Ruijie(config-ipv6-acl)# deny ipv6 fe80::2d0:f8ff:fe22:33ad/128
any
```

ipv6 access-list	-

-	-

### 48.1.10 ipv6 pim bsr-border

#### ipv6 pim bsr-border

-	-

BSR

BSM  
BSM

BSR

BSM

```
g 0/3 BSR
Ruijie# configure terminal
Ruijie(config)# interface g 0/3
Ruijie(config-if)# ipv6 pim bsr-border
```

-	-

-	-

### 48.1.11 ipv6 pim bsr-candidate

**ipv6 pim bsr-candidate** *interface-type interface-number* [ *hash-mask-length* ]  
 [*priority-value*]

<i>interface-type interface-number</i>	
<i>hash-mask-length</i>	<0-128> RP HASH 126
<i>priority-value</i>	<0-255> BSR 64

┌  
└

BSR

┌  
└

```

PIM-SMv6
RP          BSR          BSR BSR
C-BSR      BSR          PIM-SMv6 BSR BSR
BSR
          BSR          BSR          PIM
          BSR          BSR          IPV6
          BSR          BSR          IPV6
    
```

┌  
└

```

Ruijie# configure terminal
Ruijie(config)# ipv6 pim bsr-candidate g 0/3 30 100
Ruijie(config)# ipv6 pim bsr-candidate g 0/3
    
```

-	-

┌

┌

-	-

### 48.1.12 ipv6 pim dr-priority

**ipv6 pim dr-priority** *priority-value*

┌

<i>priority-value</i>	<0-4294967294> 1

┌

DR 1

┌

┌

```

DR
> Hello DR DR
IP DR
> Hello
DR IP DR
    
```

**ipv6 pim ignore-rp-set-priority**

	-	-

┌

RP-SET RP

┌

┌

RP RP

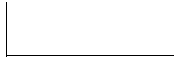
Ruijie# **configure terminal** 8 54891541718 7.52 472 Tr 10.02 0 0 10.02 78.36 716.0003 Tr

)É

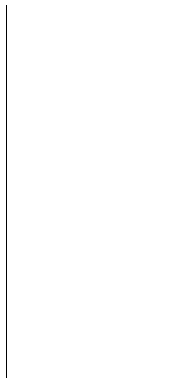
### 48.1.16 ipv6 pim neighbor-filter

**ipv6 pim neighbor-filter** *ipv6\_access-list*

<i>ipv6_access-list</i>	ipv6_access-list      acl

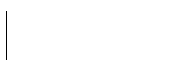


PIM  
PIM-SMV6                      peering



```
Ruijie# configure terminal
Ruijie(config)# interface g 0/3
Ruijie(config-if)# ipv6 pim neighbor-filter acl
Ruijie(config-if)# exit
Ruijie(config)# ipv6 access-list acl
                                fe80::2d0:f8ff:fe22:33ad
Ruijie(config-ipv6-acl)# deny ipv6 fe80::2d0:f8ff:fe22:33ad/128
any
```

<b>ipv6 access-list</b>	-



-	-

### 48.1.17 ipv6 pim override-interval

**ipv6 pim override-interval** *interval-milliseconds*

--	--

<i>interval-milliseconds</i>	<1-65535>
------------------------------	-----------

Hello      Override-Interval      2500

Override-Interval	
<b>r</b> J/P-override-interval	J/P-override-interval
Join-Prune	holdtime

Override-Interval      3000  
 Ruijie# **configure terminal**  
 Ruijie(config)# **interface g 0/3**  
 Ruijie(config-if)# **ipv6 pim override-interval 3000**

<b>ipv6 pim propagation-delay</b>	-
-----------------------------------	---

-	-
---	---

### 48.1.18 ipv6 pim probe-interval

**ipv6 pim probe-interval** *interval-seconds*

<i>interval-seconds</i>	<1-65535>
-------------------------	-----------

5s

DR    RP

NULL-Register

r	65535	Warning	3*	+	Warning
---	-------	---------	----	---	---------

6s

Ruijie# **configure terminal**

Ruijie(config)# **ipv6 pim probe-interval 6**

<b>ipv6 pim register-suppression</b>	-

--	--

```
Ruijie(config-if)# ipv6 pim propagation-delay 600
```

<b>ipv6 pim override-interval</b>	-
<b>ipv6 pim neighbor-tracking</b>	-

-	-

### 48.1.20 ipv6 pim query-interval

**ipv6 pim query-interval** *interval-seconds*

<i>Interval-seconds</i>	<1-65535>

Hello 30s

Hello Hello Hello Hello  
 65535 Hello 3.5 Hello \* 3.5 >  
 18725

```
Ruijie# configure terminal
Ruijie(config)# interface g 0/3
Ruijie(config-if)# ipv6 pim query-interval 60
```

-	-

--	--

--	--

### 48.1.21 ipv6 pim register-checksum-wholepkt

**ipv6 pim register-checksum-wholepkt** [group-list *ipv6\_access-list*]

<i>ipv6_access-list</i>	<i>ipv6_access-list</i> acl group-list <i>ipv6_access-list</i>

	PIM
	PIM

	PIM
	PIM

```
Ruijie# configure terminal
Ruijie(config)# ipv6 pim register-checksum-wholepkt
Ruijie(config)# ipv6 pim register-checksum-wholepkt
group-list checksum-access-list
Ruijie(config)# ipv6 access-list checksum-access-list
ff66::6666/64
Ruijie(config-ipv6-acl)# permit ipv6 any ff66::6666/64
```

<b>ipv6 access-list</b>	-

-	-

### 48.1.22 ipv6 pim register-rate-limit

**ipv6 pim register-rate-limit rate**

<i>rate</i>	register
	<1-65535>

┌

┌

┌

S G

DR RP

Ruijie# **configure terminal**  
 Ruijie(config)# **ipv6 pim register-rate-limit 3000**

-	-

┌

-	-

**48.1.23 ipv6 pim register-rp-reachability**

**ipv6 pim register-rp-reachability**

-	-

┌

RP

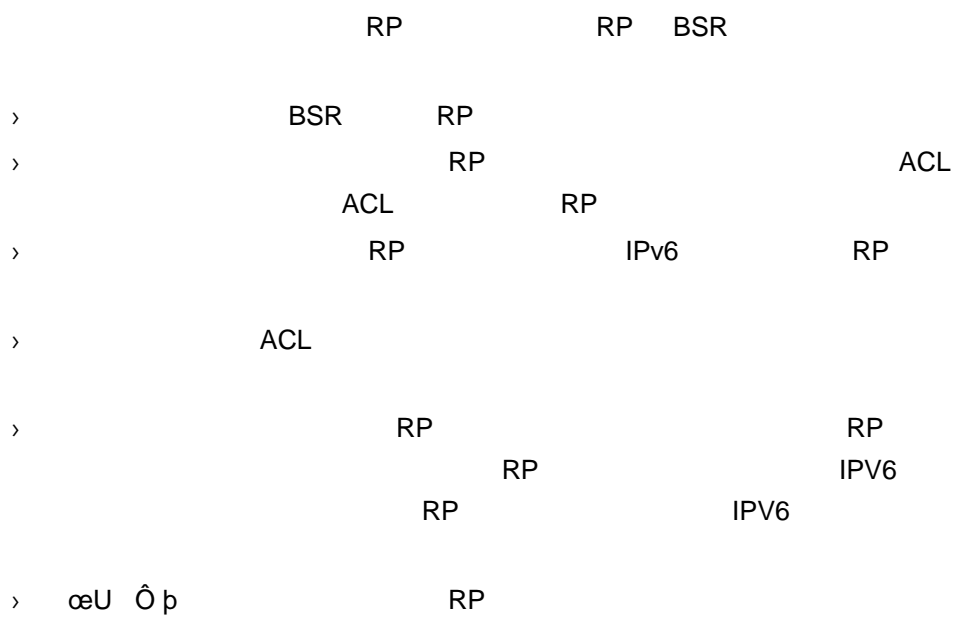
┌

┌

RP

```
Ruijie# configure terminal
```





<i>interface-type interface-number</i>	
<i>priority-value</i>	<0-255> priority priority-value 192
<i>Interval-seconds</i>	<1-16383> interval interval-seconds interval-seconds 60s
<i>ipv6_access-list</i>	acl group-list ipv6_access-list

RP

		ipv6_acl_name		RP
	ipv6_acl_name	IPV6	RP	
			RP	IPV6
		RP		
		RP	IPV6	RP
	RP		RP	IPV6
		RP	IPV6	RP
	Ruijie(config)# <b>ipv6 pim rp embedded</b>			
	<b>ipv6 access-list</b>	-		
	-	-		

### 48.1.29 ipv6 pim rp-register-kat

**ipv6 pim rp-register-kat seconds**

	seconds	KAT	<1-65535>	
	RP	KAT	210s	
	RP	KAT		

```
Ruijie# configure terminal
Ruijie(config)# ipv6 pim rp-register-kat 250
```

-	-

-	-

### 48.1.30 ipv6 pim sparse-mode

#### ipv6 pim sparse-mode

-	-

PIM-SMv6

PIM-SMv6

PIM-SMv6

PIM-SMv6

PIM-SMv6

MLD

Failed to enable PIM-SMv6 on <  
/ >, resource temporarily unavailable, please try again

PIM-SMv6 Configure failed! VIF limit  
exceeded in NSM!!!

PIM-SMv6

PIM-SMv6 PIM-DMv6

```
Ruijie# configure terminal
Ruijie(config)# interface g 0/3
Ruijie(config-if)# ipv6 pim sparse-mode
```

	-	-

-	-

### 48.1.32 ipv6 pim ssm

**ipv6 pim ssm { default / range ipv6\_access-list }**

<b>default</b>	FF3x::/32
<i>ipv6_access-list</i>	acl

SSMV6

PIM-SSMv6

```

                                acl
Ruijie# configure terminal
Ruijie(config)# ipv6 pim ssm range acl
                                fe80::2d0:f8ff:fe22:33ad          ff32::3333/64          SSM
Ruijie(config-ipv6-acl)# permit ipv6 fe80::2d0:f8ff:fe22:33ad
                                /128 ff32::3333/64
    
```

<b>ipv6 access-list</b>	-

-	-

### 48.1.33 ipv6 pim static-rp-preferred

**ipv6 pim static-rp-preferred**

--	--

	-	-
--	---	---

	BSR	RP	RP
--	-----	----	----

--	--	--	--

		RP	BSR	RP
--	--	----	-----	----

Ruijie# RP

```
Ruijie(config)# interface g 0/3  
Ruijie(config-if)# ipv6 pim triggered-hello-delay 3
```

--	--

### 48.2.2 show ipv6 pim sparse-mode bsr-router

show ipv6 pim sparse-mode bsr-router

-	-

--

--

--

BSR .

```
Ruijie# show ipv6 pim sparse-mode bsr-router
PIMv2 Bootstrap information
This system is the Bootstrap Router (BSR)
BSR address: 3333::8888
Uptime:00:03:31, BSR Priority: 64, Hash mask length: 126
Next bootstrap message in 00:00:47
Role: Candidate BSR Priority: 64, Hash mask length: 126
State: Elected BSR
Candidate RP: 3333::8888(GigabitEthernet 0/5)
Advertisement interval 60 seconds
Next Cand_RP_advertisement in 00:00:37
```

-	-

--

-	-

### 48.2.3 show ipv6 pim sparse-mode interface

**show ipv6 pim sparse-mode interface** [*interface-type interface-number* [detail] ]

	<i>interface-type interface-number</i>	interface-type interface-number
	<b>detail</b>	

|

| / /

```

interface-type interface-number

```

```


```

```

/ /

```

```

PIM-SMv6 MLD

```

```

Ruijie# show ipv6 pim sparse-mode local-members
PIM Local membership information
GigabitEthernet 0/5:
(*, ff66::6666) : Include

```

-	-

```


```

-	-

### 48.2.5 show ipv6 pim sparse-mode mroute

**show ipv6 pim sparse-mode mroute** {*ipv6\_group\_address* | *ipv6\_source\_address*}

<i>ipv6_group_address</i>	IPv6
<i>ipv6_source_address</i>	IPv6

```


```

```

/ /

```

```


```



---

	-	-
--	---	---

---

### 48.2.7 show ipv6 pim sparse-mode nexthop

show ipv6 pim sparse-mode nexthop

	-	-

---

--

/ /
-----

metric
--------

--

	-	-

---

--

	-	-

---

### 48.2.8 show ipv6 pim sparse-mode rp mapping

```
Ruijie# show ipv6 pim sparse-mode rp mapping
PIM Group-to-RP Mappings
This system is the Bootstrap Router (v2)
Group(s): ff00::/8
  RP: 3333::1
    Info source: 3333::1, via bootstrap, priority 192
    Uptime: 00:12:40, expires: 00:01:50
```

-	-

-	-

### 48.2.9 show ipv6 pim sparse-mode rp-hash

**show ipv6 pim sparse-mode rp-hash *ipv6\_group-address***

<i>ipv6_group-address</i>	IPv6

/ /

*ipv6\_group-address*      RP

```
Ruijie# show ipv6 pim sparse-mode rp-hash ff66::6666
RP: 3333::8888
Info source: 3333::8888, via bootstrap
PIMv2 Hash Value 126
RP 3333::8888, via bootstrap, priority 192, hash value 1468234650
```

--	--

	-	-
	-	-

### 48.2.10 show ipv6 pim sparse-mode track

show ipv6 pim sparse-mode track

	-	-
--	---	---

/ /

PIM  
clear ipv6 pim sparse-mode track

PIM

```

Ruijie# show ipv6 pim sparse-mode track
PIMv6 packet counters track
Elapsed time since counters cleared: 00:04:03
                received      sent
Valid PIMSMv6 packets:      0          8
Hello:                      0          8
Join-Prune:                  0          0
Register:                    0          0
Register-Stop:               0          0
Assert:                      0          0
BSM:                         0          0
C-RP-ADV:                    0          0
PIMDMv6-Graft:               0
PIMDMv6-Graft-Ack:           0
PIMDMv6-State-Refresh:       0
Unknown PIMv6 Type:          0
    
```

```

Errors:
Malformed packets:                0
Bad checksums:                    0
Send errors:                       0
Packets received with unknown PIMv6 version: 0
    
```

<b>clear ipv6 pim sparse-mode track</b>	-

-	-

# 49 MLD

## 49.1

### 49.1.1 clear ipv6 mld group

MLD

report

**clear ipv6 mld group** [*group-address*] [*interface-type interface-number*]

<i>group-address</i>	128	IPv6
<i>interface-type</i>		
<i>interface-number</i>		

MLD

MLD

**clear ipv6 mld group**

```
Ruijie# clear ipv6 mld group
```

```
Ruijie# clear ipv6 mld group ff1e::100
```

```
Ruijie# clear ipv6 mld group
```



**ipv6 mld access-group** *word*

**no ipv6 mld access-group**

<i>Word</i>	IPv6                      ACL

┌

┌

			ACL
	ACL deny    report		ACL
	MLDv2		
	S1,S2,S3...Sn,G	ACL (0,G)	MLD report ACL
<b>r</b>			ACL
	(0, G)	S1,S2,S3...Sn,G	

Eth0/1                      report                      acl

```
Ruijie(config)#ipv6 access-list acl
Ruijie(config-ipv6-acl)#permit ipv6 ::/64 ff66::100/64
Ruijie(config-ipv6-acl)#permit ipv6 2222::3333/64 ff66::100/64
Ruijie(config)# interface ethernet 0/1
Ruijie(config-if)# ipv6 mld access-group acl
```

-	-

┌

--	--

no

**ipv6 mld immediate-leave group-list** *word***no ipv6 mld immediate-leave group-list**

<i>Word</i>	IPv6	ACL

---



---



---

MLD

MLD

2s

---

```
Ruijie# configure terminal
Ruijie(config)#ipv6 access-list acl
Ruijie(config-ipv6-acl)#permit ipv6 2222::3333/64 ff66::100/64
Ruijie(config)# interface ethernet 0/1
Ruijie(config-if)# ipv6 mld immediate-leave group-list acl
```

---

<b>ipv6 mld last-member-query-interval</b>	-

---



---

-	-

### 49.1.5 ipv6 mld join-group

no

**ipv6 mld join-group** *group-address***no ipv6 mld join-group** *group-address*

<i>group-address</i>	ipv6

---



---



---

MLD

0xFF\*1 0xFF3\*

0xFF\*2

---

```
Ruijie# configure terminal
Ruijie(config)# interface fast 0/1
Ruijie(config-if)# ipv6 mld join-group ff55::100
```

---

-	-

---



---

-	-

### 49.1.6 ipv6 mld last-member-query-count

**last-member-query-count** MLD done**last-member-query-count** no**ipv6 mld last-member-query-count** *number*

**no ipv6 mld last-member-query-count**

	<b>MLD</b>
--	------------

┌

┌

MLD MLD mld last-member-query-count

┌

2  
 Ruijie# **configure terminal**  
 Ruijie(config)# **interface fa 0/1**  
 Ruijie(config-if)# **ipv6 mld last-member-query-interval 200**

┌

<b>ipv6 mld immediate-leave</b>	-

┌

┌

-	-

### 49.1.8 ipv6 mld limit ( )

MLD  
 no  
 ipv6 mld limit *number* [**except access-list**]  
 no ipv6 mld limit

┌

<i>number</i>	MLD 1024
<b>except access-list</b>	

┌

1024

┌

┌

MLD  
 report

except access-list

```

300
Ruijie(config-if)# ipv6 mld limit 300
300 acl
Ruijie(config-if)# ipv6 mld limit 300 except acl
    
```

-	-

-	-

### 49.1.9 ipv6 mld limit ( )

MLD no

**ipv6 mld limit** *number* [**except** *word*]

**no ipv6 mld limit** *number* [**except** *word*]

<i>number</i>	MLD 1-65536
<b>except</b>	
<i>word</i>	ipv6

MLD except

```

300
Ruijie config # ipv6 mld limit 300
300      acl
Ruijie(config)# ipv6 mld limit 300 except acl

```

-	-

-	-

### 49.1.10 ipv6 mld mroute-proxy

**ipv6 mld mroute-proxy** *interface-type interface-number*

**no ipv6 mld mroute-proxy**

<i>interface-type interface-number</i>	

proxy-service

MLD

mroute-proxy

```

Ruijie(config-if)# ipv6 mld mroute-proxy fa 0/1

```

-	-

	-	-

### 49.1.11 ipv6 mld proxy-service

mroute-proxy  
mroute-proxy

---

**no**

**ipv6 mld query-interval** *seconds*

**no ipv6 mld query-interval**

	<i>seconds</i>	s	1 18000

125


Ethernet 0

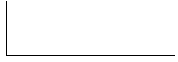
120s

Ruijie(config-if)# **ipv6 mld query-interval 120**

Ethernet 0

Ruijie(config-if)# **no ipv6 mld query-interval**





200s

Ruijie(config-if)# **ipv6 mld querier-timeout 200**

Ethernet 0

Ruijie(config-if)# **no ipv6 mld querier-timeout**

-	-

-	-

### 49.1.15 ipv6 mld robustness-variable

no

**ipv6 mld robustness-variable** *number*

**no ipv6 mld robustness-variable**

<i>number</i>	2-7

2

```

|
|
|

```

-	-

### 49.1.16 ipv6 mld ssm-map enable

**mld ssm-map**

**ipv6 mld ssm-map enable**

**no ipv6 mld ssm-map enable**

```

|
|
|

```

-	-

```

|
|
|

```

```

|
|
|

```

```

|
|
|

```

**ipv6 mld ssm-map static**

```

|
|
|

```

**mld ssm-map**

Ruijie(config)# **ipv6 mld ssm-map enable**

```

|
|
|

```

-	-

```

|
|
|

```

```

|
|
|

```

-	-

### 49.1.17 ipv6 mld ssm-map static

ssm-map

**ipv6 mld ssm-map static access-list X:X:X:X::X**

**no ipv6 mld ssm-map static access-list X:X:X:X::X**

<i>access-list</i>	ipv6	ACL
X:X:X:X::X		

**ipv6 mld ssm-map enable**

mldv2

ACL te

4444::1234

```

                                join-group
                                clear
no ipv6 mld static-group
    
```

```

Ruijie# configure terminal
Ruijie(config)# interface fast 0/1
Ruijie(config-if)# ipv6 mld static-group ff55::3
    
```

-	-

┌

-	-

### 49.1.19 ipv6 mld version

```

                                MLD
                                no
ipv6 mld version {1 | 2 }
no ipv6 mld version
    
```

{1   2}	MLD , <1-2>

┌

2.

┌

```

                                MLD
    
```

```

                                1
Ruijie# configure terminal
Ruijie(config)# interface ethernet 0/1
    
```

```
Ruijie(config-if)# ipv6 mld version 1
```

-	-

-	-

## 49.2

### 49.2.1 show ipv6 mld groups

#### MLD

```
show ipv6 mld groups [group-address | interface-type interface-number] [detail]
```

<i>group-address</i>	128 IPv6
<i>interface-type</i>	
<i>interface-number</i>	
<b>detail</b>	

```
1
```

```
Ruijie# show ipv6 mld groups
```

```
MLD Connected Group Membership
```

```
Group Address Interface Uptime Expires Last Reporter
```

```
ff66::1 VLAN1 00:10:57 00:02:16 fe80::2d0:f8ff:fe22:3378
```

2

```
Ruijie# show ipv6 mld groups detail
```

```
Interface:      VLAN 1
```

```
Group:          ff66::1
```

```
Uptime:         00:10:26
```

```
Group mode:     Exclude (Expires: 00:02:47)
```

```
Last reporter:  fe80::2d0:f8ff:fe22:3378
```

```
Source list is empty
```

-	-

-	-

## 49.2.2 show ipv6 mld interface

```
show ipv6 mld interface [interface-type interface-number]
```

```

MLD interface limit is 1024
MLD interface has 0 group-record states
MLD interface has 1 join-group records
MLD interface has 0 static-group records
MLD activity: 0 joins, 0 leaves
MLD query interval is 125 seconds
MLD querier timeout is 255 seconds
MLD max query response time is 10 seconds
Last member query response interval is 10 (1/10s)
Last member query count is 2
Group Membership interval is 260
Robustness Variable is 2

```

-	-

-	-

### 49.2.3 show ipv6 mld ssm-mapping

```
show ipv6 mld ssm-mapping [group-address]
```

<i>group-address</i>	

```
Ruijie# show ipv6 mld ssm-mapping ff66::1234
```

```
Group address: ff66::1234
```

```
Database      : Static
```

```
Source list   : 5555::1234
```

```
Ruijie# show ipv6 mld ssm-mapping
```

```
SSM Mapping   : Enabled
```

```
Database      : Static mappings configured
```

-	-

-	-

# 50 MLD Snooping

## 50.1

### 50.1.1 ipv6 mld profile

MLD profile profile profile-number mld  
profile

	<b>10.4</b>	

### 50.1.3 deny

	profile	profile	deny
	<b>deny</b>		
	profile	deny	
	profile		
	profile	range	
		FF77::100	profile :
	Ruijie(config)# <b>ipv6 mld profile 1</b>		
	Ruijie(config-profile)# <b>range FF77::100</b>		
	Ruijie(config-profile)# <b>deny</b>		
	ipv6 mld profile	profile	
	range		
	permit	profile	permit
	<b>10.4</b>		

### 50.1.4 permit

profile                                      profile                                      permit    **Ä**





VLAN

VLAN

VLAN

VLAN

mld snooping

ivgl



```
Ruijie(config)# ipv6 mld snooping svgl profile 1
```

<b>ipv6 mld snooping ivgl</b>	mld snooping      ivgl
<b>ipv6 mld snooping ivgl-svgl</b>	mld snooping

<b>10.4</b>	

50.1.[B3i[(ipv6 mld s(oothing(svgl(ivgl(svgl ))T/C2\_0 1 Tf0 Tc 0 Tw 10.5 0 0 10.5 10

<b>ipv6 mld snooping ivgl-svgl</b>	mld snooping
<b>10.4</b>	

### 50.1.9 ipv6 mld snooping dyn-mr-aging-time

```

ipv6 mld snooping dyn-mr-aging-time time
no ipv6 mld snooping dyn-mr-aging-time

```

```

ipv6 mld snooping dyn-mr-aging-time time
no ipv6 mld snooping dyn-mr-aging-time

```

<i>time</i>	1-3600
-------------	--------

300s

Hello

MLD

IPv6 PIM

500s

Ruijie(config)# **ipv6 mld snooping dyn-mr-aging-time** 500

--	--

<b>10.4</b>	

### 50.1.10 ipv6 mld snooping query-max-response-time

```
ipv6 mld snooping query-max-response-time time MLD  
no ipv6 mld snooping query-max-response-time
```

```
ipv6 mld snooping query-max-response-time time  
no ipv6 mld snooping query-max-response-time
```

<i>time</i>	MLD 1-65535

10s

MLD

0

mld snooping

MLD

0

mld snooping

MLD

MLD

15s

```
Ruijie(config)# ipv6 mld snooping query-max-response-time 15
```

Ö

**no ipv6 mld snooping vlan vid**

<i>vid</i>	vlan id 1-4094

mld snooping                      vlan                      mld snooping

mld snooping                      vlan                      mld snooping  
 vlan                      mld snooping

VLAN 1                      mld snooping

Ruijie(config)# **no ipv6 mld snooping vlan 1**


**10.4**

### 50.1.12 ipv6 mld snooping vlan mrouter learn

MLD query PIM  
**ipv6 mld snooping vlan mrouter learn**                      no

**ipv6 mld snooping vlan vid mrouter learn**  
**no ipv6 mld snooping vlan vid mrouter learn**

VLAN

no

mld snooping

Ruijie(config)# **ipv6 mld snooping vlan 1 mrouter learn**

<b>ipv6 mld snooping vlan mrouter interface</b>	

<b>10.4</b>	

### 50.1.13 ipv6 mld snooping vlan mrouter interface

**ipv6 mld snooping vlan mrouter**

**interface** no

**ipv6 mld snooping vlan vid mrouter interface interface-id**

**no ipv6 mld snooping vlan vid mrouter interface interface-id**

<i>vid</i>	vlan id 1-4094
<i>interface-id</i>	

IPv6



```
fastEthernet 0/1
```

<b>ipv6 mld snooping vlan mrouter interface</b>	

<b>10.4</b>	

### 50.1.15 ipv6 mld snooping fast-leave enable

```

                mld snooping fast-leave          ipv6 mld snooping
fast-leave enable          no          mld snooping fast-leave

ipv6 mld snooping fast-leave enable
no ipv6 mld snooping fast-leave enable

```


```

                IPv6          MLD
IPv6          MLD

```

```

                mld snooping fast-leave
Ruijie(config)# ipv6 mld snooping fast-leave

```


10.4	

### 50.1.16 ipv6 mld snooping suppression enable

```

mld snooping suppression          ipv6 mld snooping
suppression enable                no    mld snooping suppression

ipv6 mld snooping suppression enable
no ipv6 mld snooping suppression enable
    
```


└──

└──

```

          MLD
IPv6      MLD
          MLD

          suppression          MLD v1 report
          MLD v2 report
    
```

```

          mld snooping suppression
Ruijie(config)# ipv6 mld snooping suppression
    
```


└──

10.4	

### 50.1.17 ipv6 mld snooping filter

profile            no            profile

**ipv6 mld snooping filter** *profile-number*

**no ipv6 mld snooping filter** *profile-number*

*Number*

0 – 1024

```
Ruijie# clear ipv6 mld snooping gda-table
```


--	--

## 50.2

### 50.2.1 show ipv6 mld snooping

mld snooping

**Show ipv6 mld snooping [gda-table | interfaces | mrouter/ statistics [vlan *vlan-id* ]**

mld snooping	
	U 5

```
Ruijie# show ipv6 mld snooping mrouter
```

```
Vlan    Interface          State    MLD profile number
```

```
-----
```

```
1  GigabitEthernet 0/7    static    1
1  GigabitEthernet 0/12   dynamic    0
```

```
4  show ipv6 mld snooping gda-table  GDA
```

```
Ruijie# show ipv6 mld snooping gda-table
```

```
Abbr: M - mrouter
```

```
      D - dynamic
```

```
      S - static
```

```
VLAN  Address          Member ports
```

```
-----
```

```
1      FF88::1          GigabitEthernet 0/7(S)
```

```
5      show ipv6 mld snooping interface  mld snooping Filtering
```

```
Ruijie# show ipv6 mld snooping interface GigabitEthernet 0/7
```

```
Interface          Filter Profile number    max-groups
```

```
-----
```

```
GigabitEthernet 0/7          1          4294967294
```

|  
|  
|

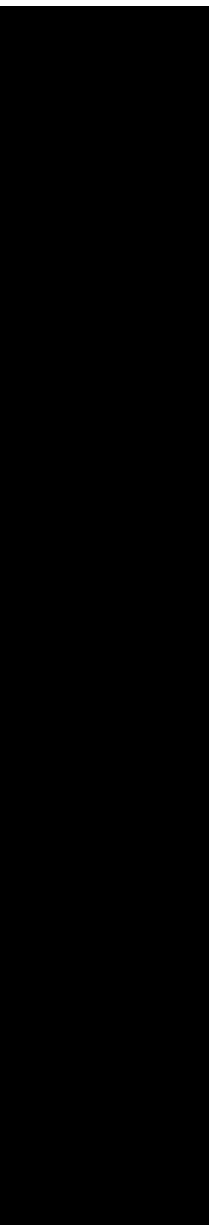
|  
|  
|

|  
|  
|

mld profile

|  
|  
|  
|  
|  
|  
|

```
1      show ipv6 mld profile      MLD profile
Ruijie# show ipv6 mld profile 1
MLD Profile 1
permit
range FF77::1 FF77::100
range FF88::123
```

---

# 51

## 51.1

### 51.1.1 storm-control

no

**storm-control** {**broadcast** | **multicast** | **unicast**} [{**level** *percent* | **pps** *packets* | *rate-bps*}]

**no storm-control** {**broadcast** | **multicast** | **unicast**} [ {**level** *percent* | **pps** *packets* | *rate-bps*}]

<b>broadcast</b>	
<b>multicast</b>	
<b>unicast</b>	
<i>percent</i>	20 20%
<i>packets</i>	pps packets per second
<i>Rate-bps</i>	
<i>64k-2M</i>	64k
<i>2-100M</i>	1M
<i>100M</i>	8M

**show storm-control**

GigabitEthernet 1/1

4M

Ruijie# **configure terminal**

Ruijie(config)# **interface GigabitEthernet 1/1**

Ruijie(config-if)# **storm-control multicast 4096**

Ruijie(config-if)# **end**

<b>show storm-control</b>	

86      **pps**

-	-

### 51.1.2 switchport protected

no

**switchport protected**

**no switchport protected**

-	-

3

**show interfaces**

Ruijie(config)# **interface gigabitethernet 1/1**

Ruijie(config-if)# **switchport protected**

<b>show interfaces</b>	

---

S32 S37

acl

-	-

### 51.1.3 switchport port-security

no

**switchport port-security [violation {protect | restrict | shutdown}]**

**no switchport port-security [violation]**

<b>port-security</b>	
<b>violation protect</b>	
<b>violation restrict</b>	trap
<b>violation shutdown</b>	Trap

MAC

IP(

---

	<b>show port-security</b>	

---

**show port-security**

<b>switchport port-security</b>	
<b>switchport port-security binding interface</b>	
<b>Switchport port-security mac-address</b>	
<b>switchport port-security aging</b>	
<b>show port-security</b>	

-	-

### 51.1.6 switchport port-security binding interface

IP+    MAC            IP

no

**[no] switchport port-security binding interface** *interface-id* *mac-address* **vlan** *vlan\_id* *ipv4-address* | *ipv6-address*

**[no] switchport port-security binding interface** *interface-id* *ipv4-address* | *ipv6-address*

<i>interface-id</i>	ID
<i>mac-address</i>	MAC
<i>Vlan_id</i>	MAC    VID
<i>Ipv4-address</i>	Ipv4    Ip
<i>Ipv6-address</i>	Ipv6    Ip

```

1      192.168.1.100      10
Ruijie(config)# switchport port-security binding interface g0/10
192.168.1.100
2      192.168.1.100 MAC      00d0.f800.5555, VID= 1      10
Ruijie(config)# switchport port-security binding interface g0/10 00d0.f800.5555
vlan 1 192.168.1.100

```

<b>switchport port-security</b>	
<b>switchport port-security binding</b>	
<b>Switchport port-security mac-address</b>	
<b>switchport port-security aging</b>	
<b>show port-security</b>	

-	-

### 51.1.7 switchport port-security maximum

no

**switchport port-security maximum *value***

**[no] switchport port-security maximum**

value	1-128

128

128



```

1 TRUNK 10 00d0.f800.5555 VID=2
Ruijie(config)#inter g0/10
Ruijie(config-if)# switchport port-security mac-address
00d0.f800.5555 vlan 2

```

<b>switchport port-security</b>	
<b>switchport port-security binding</b>	
<b>switchport port-security mac-address interface</b>	
<b>switchport port-security aging</b>	
<b>show port-security</b>	

-	-

### 51.1.9 switchport port-security mac-address interface

no

[no] **switchport port-security interface** *interface-id* **mac-address** *mac-address* [*vlan* *vlan-id*]

<i>interface-id</i>	ID
<i>mac-address</i>	
<i>vlan-id</i>	MAC VID TRUNK vlan-id

---

```
1 TRUNK 10 00d0.f800.5555 VID=2
Ruijie(config)# switchport port-security interface g0/10
mac-address 00d0.f800.5555 vlan 2
```

---

Interface Broadcast Control Multicast Control Unicast Control

-----  
Gi1/1 Disabled Disabled Disabled

<b>.storm-control</b>	

--	--

---

<b>switchport port-security</b>	
<b>switchport port-security aging</b>	
<b>switchport port-security mac-address</b>	

# 52 802.1X

## 52.1 dot1x

### 52.1.1 dot1x auto-req

802.1X

dot1x auto-req

no

[no] dot1x auto-req

--	--	--

-

-



-	-

### 52.1.3 dot1x auto-req req-interval

no

**dot1x auto-req req-interval** *interval*

**no dot1x auto-req req-interval**

<i>interval</i>	s

30

**show dot1x auto-req**

```

802.1x          60s
Ruijie# configure terminal
Ruijie(config)# dot1x auto-req req-interval 60
Ruijie(config)# end
Ruijie# show dot1x auto-req
Auto-Req: Enabled
User-Detect : Enabled
Packet-Num  : 0
Req-Interval: 60 Second
    
```

<b>show dot1x auto-req</b>	

-	-

## 52.1.4 dot1x auto-req user-detect

no

**dot1x auto-req user-detect**

**no dot1x auto-req user-detect**

-	-

└───

└───

└───

**show dot1x auto-req**

└───

```
Ruijie# configure terminal
Ruijie(config)# dot1x auto-req user-detect
Ruijie(config)# end
Ruijie# show dot1x auto-req
Auto-Req: Enabled
User-Detect : Enabled
Packet-Num : 0
Req-Interval: 60 Second
```

└───

<b>show dot1x auto-req</b>	

└───

└───

-	-

## 52.2 dot1x

### 52.2.1 dot1x timeout quiet-period

**no**

**dot1x timeout quiet-period** *seconds*

**no dot1x timeout quiet-period**

<i>seconds</i>	0	65535 s

10

```

Client Oline Probe: Disabled
Eapol Tag Enable: Disabled
Authorization Mode: Group Server

```

<b>show dot1x</b>	802.1x

**no**

**dot1x timeout re-authperiod** *seconds*

**no dot1x timeout re-authperiod**

<i>seconds</i>	0 65535 s

3600

**show dot1x**

802.1x

1000s

```
Ruijie# configure terminal
```

```
Ruijie(config)# dot1x timeout re-authperiod 1000
```

```
Ruijie(config)# end
```

```
Ruijie# show dot1x
```


```
802.1X Status: Enabled
```

```
Authentication Mode: EAP-MD5
```

```
Authed User Number: 0
```

```
Re-authen Enabled: Disabled
```

Re-authen Period: 1000 sec  
Quiet Timer Period: 1000 sec  
Tx Timer Period: 3 sec  
Supplicant Timeout: 3 sec  
Server Timeout: 5 sec  
Re-authen Max: 3 times  
Maximum 2Request: 3 times  
Filter Non-RG Supp: Disabled  
Client Oline Probe: Disabled  
Eapol Tag Enable: Disabled  
Authorization Mode: Group Server







-	-
---	---

## 52.2.5 dot1x timeout tx-period

no

**dot1x timeout tx-period** *seconds*

**no dot1x timeout tx-period**

<i>seconds</i>	0 65535

3

**show dot1x** 802.1x

10s

```
Ruijie# configure terminal
Ruijie(config)# dot1x timeout tx-period 10
Ruijie(config)# end
Ruijie# show dot1x
802.1X Status:      Enabled
Authentication Mode: EAP-MD5
Authed User Number: 0
Re-authen Enabled:  Disabled
Re-authen Period:  1000 sec
Quiet Timer Period: 1000 sec
Tx Timer Period:   10 sec
Supplicant Timeout: 10 sec
Server Timeout:    10 sec
Re-authen Max:     3 times
Maximum Request:   3 times
Filter Non-RG Supp: Disabled
Client Oline Probe: Disabled
Eapol Tag Enable:  Disabled
```

Authorization Mode: Group Server

**show dot1x**

802.1x

```

Re-authen Period: 1000 sec
Quiet Timer Period: 1000 sec
Tx Timer Period: 10 sec
Supplicant Timeout: 10 sec
Server Timeout: 10 sec
Re-authen Max: 3 times
Maximum Request: 3 times
Filter Non-RG Supp: Disabled
Client Oline Probe: Disabled
Eapol Tag Enable: Disabled
Authorization Mode: Group Server
    
```

<b>show dot1x</b>	802.1x

-	-

### 52.3.2 dot1x reauth-max

**no**

**dot1x reauth-max count**

**no dot1x reauth-max**

<i>count</i>	

3

**show dot1x**

802.1x

```

Ruijie# configure terminal
Ruijie(config)# dot1x reauth-max 5
Ruijie(config)# end
Ruijie# show dot1x
802.1X Status:          Enabled
Authentication Mode:   EAP-MD5
Authed User Number:    0
Re-authen Enabled:     Enabled
Re-authen Period:      1000 sec
Quiet Timer Period:    1000 sec
Tx Timer Period:        10 sec
Supplicant Timeout:    10 sec
Server Timeout:         10 sec
Re-authen Max:          5 times
Maximum Request:        3 times
Filter Non-RG Supp:    Disabled
Client Oline Probe:    Disabled
Eapol Tag Enable:      Disabled
Authorization Mode:     Group Server

```

<b>show dot1x</b>	802.1x

-	-

## 52.4 dot1x

### 52.4.1 dot1x probe-timer

**dot1x probe-timer**{interval | alive}*interval*

**no dot1x probe-timer**

<b>no</b>	
<i>interval</i>	hello
<b>alive</b>	
<b>interval</b>	

```
Hello          20
                250
```

```
show dot1x      802.1x
```

```
hello          30 ,          120
Ruijie# configure terminal
Ruijie(config)# dot1x probe-timer interval 30
Ruijie(config)# dot1x probe-timer alive 120
Ruijie(config)# end
Ruijie# show dot1x probe-timer
Hello Interval: 30 Seconds
Hello Alive: 120 Seconds
```

<b>Show dot1x probe-timer</b>	
-------------------------------	--

```
! ! 2
```

---

	-	-
--	---	---

---

--	--	--

---

--	--	--

---

--	--	--

```
Ruijie# configure terminal
Ruijie(config)# dot1x client-probe enable
Ruijie(config)# end
Ruijie# show dot1x
802.1X Status:      Enabled
Authentication Mode: EAP-MD5
Authed User Number: 0
Re-authen Enabled:  Enabled
Re-authen Period:  1000 sec
Quiet Timer Period: 1000 sec
Tx Timer Period:    10 sec
Supplicant Timeout: 10 sec
Server Timeout:     10 sec
```

## 52.5 dot1x

### 52.5.1 dot1x authentication

AAA

AAA

**no**

**dot1x authentication** {default | *list-name*}

**no dot1x authentication** {default | *list-name*}

---



## 52.5.2 dot1x auth-address-table

802.1X

no

**dot1x auth-address-table address** *mac-addr* **interface** *interface*

**no dot1x auth-address-table address** *mac-addr* **interface** *interface*

<i>mac-addr</i>	
<i>Interface</i>	

└───┘

└───┘

└───┘

802.1X

show dot1x auth-address

table

└───┘

```
Ruijie# configure terminal
Ruijie(config)# dot1x auth-address-table address
00d0f8000000 interface ethernet 1/1
Ruijie(config)# end
Ruijie#
```

└───┘

<b>show dot1x auth-address-table</b>	802.1X

└───┘

└───┘

-	-

## 52.5.3 dot1x auth-mode

802.1x

**dot1x auth-mode {eap-md5 | chap | pap}**

**no dot1x auth-mode**

<b>eap-md5</b>	802.1x	EAP-MD5
<b>chap</b>	802.1x	CHAP
<b>pap</b>	802.1x	PAP

EAP-MD5

**show dot1x** 802.1x

802.1x

```
Ruijie# configure terminal
Ruijie(config)# dot1x auth-mode chap
Ruijie(config)# end
Ruijie#
```

<b>show dot1x</b>	802.1x

|

|

**show dot1x** 802.1x

|

```

802.1x
Ruijie# configure terminal
Ruijie(config)# dot1x default
Ruijie(config)# end
Ruijie# end
    
```

|

<b>show dot1x</b>	802.1x

|

|

-	-

### 52.5.5 dot1x dynamic-vlan enable

vlan                      no

**dot1x dynamic-vlan enable**

**no dot1x dynamic-vlan enable**

|

-	-

|

|

|

**show dot1x dynamic-vlan** 802.1x

|

```

802.1x    vlan
Ruijie# configure terminal
    
```

```
Ruijie(config)# dot1x dynamic-vlan enable
Ruijie(config)# end
Ruijie#
```

<b>show dot1x</b>	802.1x

-	-

### 52.5.6 dot1x guest-vlan

```

      guest vlan          no
dot1x dynamic-vlan <1 - 4094>
no dot1x guest-vlan

```

vid	<1 - 4094>

```
>          guest vlan          dot1x dynamic-vlan enable
          guest vlan
```

	<b>show running-config</b>	802.1x

	-	-

## 52.5.7 dot1x eapol-tag

EAPOL TAG

**dot1x eapol-tag**

**no dot1x eapol-tag**

	-	-

|

|

|

**show dot1x** 802.1x

|

802.1X tag

```
Ruijie# configure terminal
Ruijie(config)# dot1x eapol-tag
Ruijie(config)# end
Ruijie#
```

|

<b>show dot1x</b>		802.1x

|

|

	-	-

## 52.5.8 dot1x max-req

DOT1X

DOT1X

DOT1X

**no**

**dot1x max-req** *count*

**no dot1x max-req**



---

**show dot1x private-supPLICant-only** 802.1x

```
Ruijie# configure t  
Ruijie(config)# dot1x private-supPLICant-only  
Ruijie(config)# end  
Ruijie#
```

<b>show dot1x private-supPLICant-only</b>	

-	-

```
Ruijie#
```

<b>show dot1x</b>	802.1x

-	-

### 52.5.11 dot1x port-control-mode

802.1x

MAC

**dot1x port-control-mode {mac-based | {port-based [single-host]} }**

**no dot1x port-control-mode**

<b>mac-based</b>	mac 802.1X
<b>port-based</b>	802.1X
<b>single-host</b>	802.1x

5 b ÊÀ@ Ûp

```
single-host
```

```

1          802.1x
Ruijie(config)# interface g 0/1
Ruijie(config-if)# dot1x port-control auto
Ruijie(config-if)# dot1x port-control-mode port-based
Ruijie(config-if)# end
Ruijie#

2          802.1x
Ruijie(config)# interface g 0/1
Ruijie(config-if)# dot1x port-control auto
Ruijie(config-if)# dot1x port-control-mode port-based single-host
Ruijie(config-if)# end
Ruijie#

```

<b>show dot1x port-control</b>	802.1x
<b>Show running-config</b>	

-	-

## 52.5.12 dot1x stationarity enable

802.1x

802.1X

**dot1x stationarity enable****no dot1x stationarity enable**

-	-



1 ruijie.net/web

Ruijie(config)# **dot1x redirect url** http://ruijie.net/web

802.1X

<b>dot1x redirect for special tcp-destination port</b>	
<b>dot1x redirect num for special source-ip</b>	
<b>show dot1x</b>	dot1x

└───

-	-

### 52.5.16 dot1x redirect num for special source-ip

1                      1-10                      no

**dot1x redirect num for special source-ip *num***

**no dot1x redirect num for special source-ip**

--	--

	<b>show dot1x</b>	dot1x
	-	-

## 52.6 dot1x

### 52.6.1 show dot1x

802.1x

**show dot1x**

	-	-

```

Ruijie# show dot1x
802.1X Status:      Enabled
Authentication Mode: EAP-MD5
Authed User Number: 0
Re-authen Enabled: Disabled
Re-authen Period:  3600 sec
Quiet Timer Period: 10 sec
Tx Timer Period:   3 sec
Supplicant Timeout: 3 sec
Server Timeout:   5 sec
Re-authen Max:    3 times
Maximum Request:  3 times

```

```

Filter Non-RG Supp: Disabled
Client Oline Probe: Disabled
Eapol Tag Enable: Disabled
Authorization Mode: Group Server
Ruijie#
    
```

<b>dot1x auth-mode</b>	802.1x
<b>dot1x max-req</b>	
<b>dot1x port-control auto</b>	
<b>dot1x reauth-max</b>	
<b>dot1x re-authentication</b>	
<b>dot1x timeout quiet-period</b>	
<b>dot1x timeout re-authperiod</b>	
<b>dot1x timeout server-timeout</b>	
<b>dot1x timeout supp-timeout</b>	
<b>dot1x timeout tx-period</b>	

-	-
---	---

802.1X

**show dot1x auth-address-table**[addressmac-addr][interface interface]

<i>mac-addr</i>	<i>interface</i>

└───

└───

└───

```
Ruijie# show dot1x auth-address-table
interface:g3/1
-----
mac addr: 00D0.F800.0001
Ruijie#
```

<b>dot1x auth-mode</b>	802.1x
<b>dot1x max-req</b>	
<b>dot1x port-control auto</b>	
<b>dot1x reauth-max</b>	
<b>dot1x re-authentication</b>	
<b>dot1x timeout quiet-period</b>	
<b>dot1x timeout re-authperiod</b>	
<b>dot1x timeout server-timeout</b>	
<b>dot1x timeout supp-timeout</b>	
<b>dot1x timeout tx-period</b>	

└───

└───

-	-

## 52.6.3 show dot1x auto-req

802.1x

show dot1x auto-req

-	-

└───┘

└───┘

└───┘

```
Ruijie# show dot1x auto-req
Auto-Req: Disabled
User-Detect : Enabled
Packet-Num : 0
Req-Interval: 30 Seconds
```

<b>dot1x auth-mode</b>	802.1x
<b>dot1x max-req</b>	
<b>dot1x port-control auto</b>	
<b>dot1x reauth-max</b>	
<b>dot1x re-authentication</b>	
<b>dot1x timeout quiet-period</b>	
<b>dot1x timeout re-authperiod</b>	
<b>dot1x timeout server-timeout</b>	
<b>dot1x timeout supp-timeout</b>	
<b>dot1x timeout tx-period</b>	

	-	-

## 52.6.4 show dot1x private-supPLICANT-only

**show dot1x private-supPLICANT-only**

	-	-

└───

└───

└───

```
Ruijie# show dot1x private-supPLICANT-only
private-supPLICANT-only:: disabled
Ruijie#
```

<b>dot1x auth-mode</b>	802.1x
<b>dot1x max-req</b>	
<b>dot1x port-control auto</b>	
<b>dot1x reauth-max</b>	
<b>dot1x re-authentication</b>	
<b>dot1x timeout quiet-period</b>	
<b>dot1x timeout re-authperiod</b>	
<b>dot1x timeout server-timeout</b>	

	<b>dot1x timeout supp-timeout</b>	
	<b>dot1x timeout tx-period</b>	
	-	-

## 52.6.5 show dot1x max-req

show dot1x max-req

-	-

└───┘

└───┘

└───┘

```
Ruijie# show dot1x max-req
max-req: 2 times
Ruijie#
```

<b>dot1x auth-mode</b>	802.1x
<b>dot1x max-req</b>	
<b>dot1x port-control auto</b>	
<b>dot1x reauth-max</b>	
<b>dot1x re-authentication</b>	
<b>dot1x timeout quiet-period</b>	
<b>dot1x timeout re-authperiod</b>	
<b>dot1x timeout server-timeout</b>	
<b>dot1x timeout supp-timeout</b>	
<b>dot1x timeout tx-period</b>	

└───┘

-	-

### 52.6.6 show dot1x port-control

**show dot1x port-control [interface *interface*]**

<i>interface</i>	

└──

└──

└──

```
Ruijie# show dot1x port-control
interface dyn-user static-user max-user qos
ctrl-mode status
-----
Gi0/1      0          1          6000      dscp: 0 mac-base Authed
Ruijie#
```

<b>dot1x auth-mode</b>	802.1x

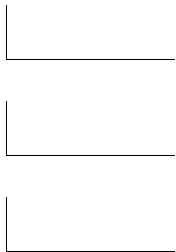
(R) (M) (D) (E) (A) (A)

	<b>dot1x timeout server-timeout</b>	
	<b>dot1x timeout supp-timeout</b>	
	<b>dot1x timeout tx-period</b>	
	-	-

### 52.6.7 show dot1x probe-timer

**show dot1x probe-timer**

	-	-



```
Ruijie# show dot1x probe-timer
Hello Interval: 20 Seconds
Hello Alive: 250 Seconds
Ruijie#
```

	<b>dot1x auth-mode</b>	802.1x
	<b>dot1x max-req</b>	
	<b>dot1x port-control auto</b>	



<b>dot1x auth-mode</b>	802.1x
<b>dot1x max-req</b>	
<b>dot1x port-control auto</b>	
<b>dot1x reauth-max</b>	
<b>dot1x re-authentication</b>	
<b>dot1x timeout quiet-period</b>	
<b>dot1x timeout re-authperiod</b>	
<b>dot1x timeout server-timeout</b>	
<b>dot1x timeout supp-timeout</b>	
<b>dot1x timeout tx-period</b>	

└───

-	-

### 52.6.9 show dot1x reauth-max

**show dot1x reauth-max**

-	-

└───

└───

└───

```
Ruijie# show dot1x reauth-max
reauth-max: 2 times
Ruijie#
```

<b>dot1x auth-mode</b>	802.1x
<b>dot1x max-req</b>	
<b>dot1x port-control auto</b>	
<b>dot1x reauth-max</b>	
<b>dot1x re-authentication</b>	
<b>dot1x timeout quiet-period</b>	
<b>dot1x timeout re-authperiod</b>	
<b>dot1x timeout server-timeout</b>	
<b>dot1x timeout supp-timeout</b>	
<b>dot1x timeout tx-period</b>	

-	-

### 52.6.10 show dot1x summary

802.1X

**show dot1x summary**

-	-

```

Ruijie# show dot1x summary
ID      MAC          Interface VLAN Auth-State
Backend-State Port-Status Type
-----
1 00d0f8000000 Gi0/1      1 Authenticated Idle
Authed   Static
Ruijie#
    
```

<b>dot1x auth-mode</b>	802.1x
<b>dot1x max-req</b>	
<b>dot1x port-control auto</b>	
<b>dot1x reauth-max</b>	
<b>dot1x re-authentication</b>	
<b>dot1x timeout quiet-period</b>	
<b>dot1x timeout re-authperiod</b>	
<b>dot1x timeout server-timeout</b>	
<b>dot1x timeout supp-timeout</b>	
<b>dot1x timeout tx-period</b>	

-	-
---	---

## **52.6.11 show dot1x user id**

<b>dot1x max-req</b>	
<b>dot1x port-control auto</b>	

```
Ruijie# show dot1x timeout quiet-period  
quiet-period: 60 sec  
Ruijie#
```

<b>dot1x auth-mode</b>	802.1x
<b>dot1x max-req</b>	
<b>dot1x port-control auto</b>	
<b>dot1x reauth-max</b>	
<b>dot1x re-authentication</b>	

```
dot1x timeo/Tpf-0.0024 Tw 1.198 <4-0.0024 Tw 1.] 0.47A48 20.1 33.36 394.9840.1 F909B7>E2080
```

# 53 AAA

## 53.1

### 53.1.1 aaa authentication dot1x

AAA 802.1X

**aaa authentication dot1x**

<b>aaa new-model</b>	AAA
<b>dot1x authentication</b>	802.1X
<b>username</b>	

AAA Enable

RADIUS

RADIUS

Ruijie(config)# **aaa authentication enable default group radius local**

┌

┌

```

AAA                                     AAA  Login
aaa authentication login              Login
Login                                  Login
    
```

┌

```

list-1  AAA Login
RADIUS                                     RADIUS
Ruijie(config)# aaa authentication login list-1 group radius local
    
```

┌

<b>aaa new-model</b>	AAA
<b>username</b>	
<b>login authentication</b>	Login

┌

┌

-	-

### 53.1.4 aaa authentication ppp

```

AAA  PPP                                aaa authentication ppp  PPP
no
    
```

**aaa authentication ppp** {default | list-name} method1 [method2...]

**no aaa authentication ppp** {default | list-name}

┌

<b>default</b>	PPP
<i>list-name</i>	PPP
<i>method</i>	local none group 4

<b>local</b>	
<b>none</b>	
<b>group</b>	TACACS+ RADIUS

AAA PPP AAA PPP  
**aaa authentication ppp** PPP

rds\_ppp AAA PPP  
RADIUS RADIUS

Ruijie(config)# **aaa authentication ppp** rds\_ppp

<b>default</b>	Login
<i>list-name</i>	Login

┌

┌

┌

```

Login
Login
                                Login
                                Login
                                Login

```

┌

```

list-1 AAA Login
VTY 0 - 4
Ruijie(config)# aaa authentication login list-1 local
Ruijie(config)# line vty 0 4
Ruijie(config-line)# login authentication list-1

```

┌

<b>aaa new-model</b>	AAA
<b>username</b>	
<b>login authentication</b>	Login

┌

┌

-	-

## 53.2

### 53.2.1 aaa authorization commands

	NAS	CLI	AAA	<b>aaa authorization</b>
<b>commands</b>		no	AAA	
<b>aaa authorization commands</b> <i>level</i> { <b>default</b>   <i>list-name</i> } <i>method1</i> [ <i>method2...</i> ]				

**no aaa authorization commands** *level* {**default** | *list-name*}

<i>level</i>	0~15
<b>default</b>	Q

## 53.2.2 aaa authorization config-commands

AAA

**aaa authorization config-commands**

no

AAA

**aaa authorization config-commands**

**no aaa authorization config-commands**



	-	-

|

|

|

RGOS

|

Ruijie(config)# **aaa authorization console**

|

<b>aaa new-model</b>	AAA

AAA

<b>default</b>	Network
<i>method</i>	none group 4
<b>none</b>	
<b>group</b>	TACACS+ RADIUS

AAA Network

RGOS

PPP SLIP

RADIUS TACACS+

**G5Bö**

RADIUS ! @  
Ruijie(config)# **aaa authorization network default group radius**

<b>aaa new-model</b>	AAA
<b>aaa accounting</b>	AAA
<b>aaa authentication</b>	AAA

**authorization****commands** no**authorization commands** *level* {**default** | *list-name*}**no authorization commands** *level*

<i>level</i>	0~15
<b>default</b>	
<i>list-name</i>	

AAA

cmd

15

TACACS+

none

VTY 0-4

Ruijie(config)# **aaa authorization commands 15 cmd group tacacs+ none**Ruijie(config)# **line vty 0 4**Ruijie(config-line)# **authorization commands 15 cmd**

<b>aaa new-model</b>	AAA
<b>aaa authorization commands</b>	AAA

-	-

**53.2.7 authorization exec**

Exec

**authorization exec**

no

Exec

**authorization exec {default | list-name}****no authorization exec**

<b>default</b>	Exec
<i>list-name</i>	Exec

AAA Exec

Exec

Exec

Exec

Exec

exec-1 Exec

RADIUS

none

VTY 0 – 4

Ruijie(config)# **aaa authorization exec exec-1 group radius none**Ruijie(config)# **line vty 0 4**Ruijie(config-line)# **authorization exec exec-1**

<b>aaa new-model</b>	AAA
<b>aaa authorization commands</b>	AAA Exec

-	-

## 53.3

### 53.3.1 aaa accounting commands

## NAS

**aaa accounting commands** no

**aaa accounting commands** *level* {**default** | *list-name*} **start-stop** *method1* [*method2...*]

**no aaa accounting commands** *level* {**default** | *list-name*}

<i>level</i>	0~15
<b>default</b>	
<i>list-name</i>	
<i>method</i>	<b>none group</b> 4
<b>none</b>	
<b>group</b>	TACACS+

RGOS



AAA

---

<b>aaa new-model</b>	AAA
<b>aaa authentication</b>	AAA
<b>accounting commands</b>	Exec

```
Ruijie(config)# aaa accounting network default start-stop group radius
```

aaa new-model	AAA
aaa authorization network	AAA
aaa authentication	AAA
username	

-	-

### 53.3.4 aaa accounting update

aaa accounting update

no

aaa accounting update

no aaa accounting update

-	-

AAA

AAA

```
Ruijie(config)# aaa new-model
```

```
Ruijie(config)#
```

--	--

	<b>aaa new-model</b>	AAA
	<b>aaa accounting network</b>	



-	-

### 53.3.6 accounting commands

#### accounting commands

no

**accounting commands** *level* {**default** | *list-name*}

**no accounting commands** *level*

<i>level</i>	0~15
<b>default</b>	
<i>list-name</i>	

└──

└──

└──

cmd

15

TACACS+

none

VTY 0-4

```
Ruijie(config)# aaa accounting commands 15 cmd group tacacs+ none
```

```
Ruijie(config)# line vty 0 4
```

```
Ruijie(config-line)# accounting commands 15 cmd
```

<b>aaa new-model</b>	AAA
<b>aaa accounting commands</b>	AAA

└──

-	-

### 53.3.7 accounting exec

Exec

no

Exec

**accounting exec****accounting exec** {default | *list-name*}**no accounting exec**

<b>default</b>	Exec
<i>list-name</i>	Exec

└───┘

└───┘

└───┘

└───┘

```

Exec
Exec
                                Exec
                                Exec

```

└───┘

```

                                exec-1 Exec
                                none      RADIUS
                                none      VTY 0 - 4
Ruijie(config)# aaa accounting exec exec-1 group radius none
Ruijie(config)# line vty 0 4
Ruijie(config-line)# accounting exec exec-1

```

└───┘

<b>aaa new-model</b>	AAA
<b>aaa accounting commands</b>	AAA Exec

└───┘

└───┘

--	--

-	-
---	---

## 53.4

## AAA

### 53.4.1 aaa domain

no

**aaa domain** {default | *domain-name*}

**no aaa domain** {default | *domain-name*}

<b>default</b>	
<i>domain-name</i>	

┌

┌

┌

AAA            default  
                 *domain-name*

32

┌

```
Ruijie(config)# aaa domain ruijie.com
Ruijie(config-aaa-domain)#
```

<b>aaa new-model</b>	AAA
<b>aaa domain enable</b>	AAA
<b>show aaa domain</b>	

┌

┌

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---	---

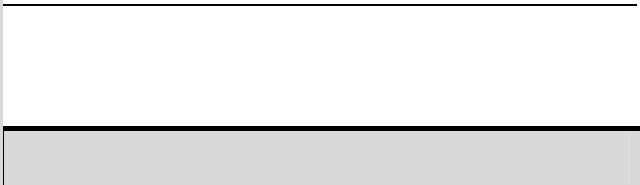
## 53.4.2 aaa domain enable

AAA  
AAA no

**aaa domain enable**

**no aaa domain enable**

--	--



“



```
default
```

```
Network
```

```
Network
```

```
Ruijie(config)# aaa domain ruijie.com
```

```
Ruijie(config-aaa-domain)# accounting network default
```

<b>aaa new-model</b>	AAA
<b>aaa domain enable</b>	AAA
<b>show aaa domain</b>	

-	-

### 53.4.5 authentication dot1x

```
IEEE802.1x
```

```
no
```

```
authentication dot1x {default | list-name}
```

```
no authentication dot1x |
```

```
IEEE802.1x
```

```
IEEE802.1x
```

```
Ruijie(config)# aaa domain ruijie.com
```

```
Ruijie(config-aaa-domain)# authentication dot1x default
```

<b>aaa new-model</b>	AAA
<b>aaa domain enable</b>	AAA
<b>show aaa domain</b>	

-	-

### 53.4.6 authorization network

```
Network no
```

```
authorization network {default | list-name}
```

```
no authorization network
```

<b>default</b>	
<i>list-name</i>	

```
default
```

```
Ruijie(config)# aaa domain ruijie.com
```

```
Ruijie(config-aaa-domain)# authorization network default
```



---

<b>aaa new-model</b>	AAA
<b>aaa domain enable</b>	AAA
<b>show aaa domain</b>	

-	-

### 53.4.8 show aaa domain

**show aaa domain [default**

AAA

---

	<b>aaa new-model</b>	AAA
	<b>aaa domain enable</b>	AAA

---

	-	-

### 53.4.9 username-format

NAS

-	-

## 53.5 AAA

### 53.5.1 aaa group server

AAA no

**aaa group server {radius | tacacs+} name**

**no aaa group server {radius | tacacs+} name**

<i>name</i>	tacacs+	RADIUS	radius TACACS+

AAA RADIUS TACACS+

```
Ruijie(config)# aaa group server radius ss
```

```
Ruijie(config-gs-radius)# end
```

```
Ruijie# show aaa group
```

```
Group Name: ss
```

```
Group Type: radius
```

```
Referred: 1
```

```
Server List:
```

<b>show aaa group</b>	aaa

	-	-

### 53.5.2 ip vrf forwarding

AAA vrf no

**ip vrf forwarding** *vrf\_name*

**no ip vrf forwarding**

	<i>vrf_name</i>	vrf

└──

└──

└──

vrf

```
Ruijie(config)# aaa group server radius ss
Ruijie(config-gs-radius)# server 192.168.4.12
Ruijie(config-gs-radius)# server 192.168.4.13
Ruijie(config-gs-radius)# ip vrf forwarding vrf_name
Ruijie(config-gs-radius)# end
```

	<b>aaa group server</b>	aaa

**show aaa group**

AAA no

**server ip-addr [authen-port port1] [acct-port port2]**

**no server ip-addr [authen-port port1] [acct-port port2]**

<i>ip-addr</i>	ip
<i>port1</i>	RADIUS
<i>port2</i>	RADIUS

```
Ruijie(config)# aaa group server radius ss
Ruijie(config-gs-radius)# server 192.168.4.12
acct-port 5 authen-port 6
Ruijie(config-gs-radius)# end
Ruijie# show aaa group
Group Name: ss
Group Type: radius
Referred: 2
Server List:
IP Address: 192.168.4.12
Authentication Port: 6
Accounting Port: 5
Referred: 1
```

<b>aaa group server</b>	aaa
<b>show aaa group</b>	aaa

AAA

	-	-
--	---	---

### 53.5.4 show aaa group

AAA

**show aaa group**

	-	-

|

|

|

AAA

Ruijie# **show aaa group**  
Group Name: ss  
Group Type: radius  
Referred: 2  
Server List:  
IP Address: 192.168.217.64  
Authentication Port: 1812  
Accounting Port: 1813  
Referred: 1

	<b>aaa group server</b>	AAA

|

|

|

	-	-

### 53.6 AAA

### 53.6.1 aaa local authentication attempts

login

**aaa local authentication attempts** *max-attempts*

<i>max-attempts</i>	1~2147483647

3

Login

Ruijie# **configure terminal**

Ruijie(config)# **aaa local authentication attempts 6**

<b>Show running-config</b>	
<b>Show aaa lockout</b>	login

-	-
---	---

### 53.6.2 aaa local authentication lockout-time

login

**aaa local authentication lockout-time** *lockout-time*

<i>lockout-time</i>	1~2147483647

15

|

| login

|

Ruijie# **configure terminal**  
 Ruijie(config)# **aaa local authentication lockout-time 5**

|

<b>Show running-config</b>	
<b>Show aaa lockout</b>	login

|

|

-	-

### 53.6.3 aaa new-model

RGOS AAA **aaa new-model** AAA  
 no AAA

**aaa new-model**

**no aaa new-model**

|

-	-

| AAA

|

|

AAA AAA **aaa new-model**  
 AAA AAA AAA

|

AAA  
 Ruijie(config)# **aaa new-model**

<b>aaa authentication</b>	
<b>aaa authorization</b>	
<b>aaa accounting</b>	

└──

-	-

### 53.6.4 clear aaa local user lockout

**clear aaa local user lockout {all | user-name <word>}**

<word>	ID

└──

└──

└──

Ruijie# **clear aaa local user lockout all**

<b>show running-config</b>	
<b>show aaa lockout</b>	login

└──

-	-

### 53.6.5 debug aaa

AAA

no

**debug aaa event****no debug aaa event**

	-	-

|

| EXEC

|

|

	-	-

|

	-	-

### 53.6.6 show aaa method-list

AAA

**show aaa method-list**

	-	-

|

|

## AAA

## AAA

```
Ruijie# show aaa method-list
Authentication method-list
aaa authentication login default group radius
aaa authentication ppp default group radius
aaa authentication dot1x default group radius
aaa authentication dot1x san-f local group angel group rain none
aaa authentication enable default group radius
Accounting method-list
aaa accounting network default start-stop group radius
Authorization method-list
aaa authorizing network default group radius
```

|

|

Ruijie# **show aaa user lockout all**

|

<b>show running-config</b>	
<b>show aaa lockout</b>	login

|

|

-	-



## 54.1.2 radius attribute

**radius ttribute**{<id> | **down-rate-limit** | **dscp** | **mac-limit** | **up-rate-limit**} **vendor-type**  
<type>

**no radius attribute** {<id>|**down-rate-limit** | **dscp** | **mac-limit** | **up-rate-limit**} **vendor-type**

<i>id</i>	id <1-255>
<i>type</i>	type

id		type
1	max down-rate	1
2	qos	2
3	user ip	3
4	vlan id	4
5	version to client	5
6	net ip	6
7	user name	7
8	password	8
9	file-diractory	9
10	file-count	10
11	file-name-0	11
12	file-name-1	12
13	file-name-2	13
14	file-name-3	14
15	file-name-4	15
16	max up-rate	16
17	version to server	17
18	flux-max-high32	18
19	flux-max-low32	19
20	proxy-avoid	20
21	dailup-avoid	21
22	ip privilege	22

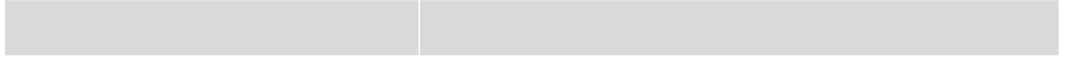
23	login privilege	42
id		type
1	max down-rate	76
2	qos	77
3	user ip	3
4	vlan id	4
5	version to client	5
6	net ip	6
7	user name	7
8	password	8
9	file-diractory	9
10	file-count	10
11	file-name-0	11
12	file-name-1	12
13	file-name-2	13
14	file-name-3	14
15	file-name-4	15
16	max up-rate	75
17	version to server	17
18	flux-max-high32	18
19	flux-max-low32	19
20	proxy-avoid	20
21	dailup-avoid	21
22	ip privilege	22
23	login privilege	42
24	limit to user number	50

max up-rate









RADIUS

**radius-server timeout no**

**radius-server timeout *seconds***

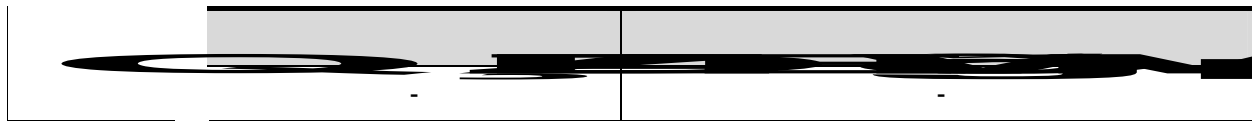
**no radius-server timeout**





RADIUS

<b>radius attribute</b>	
<b>radius set</b>	qos      cos



## 54.2 RADIUS

### 54.2.1 debug radius

RADIUS

no

RADIUS

**debug radius [event | detail]**

**no debug radius [event | detail]**



RADIUS

**show radius parameter**

-	-

|

|

|

radius

|

```
Ruijie# show radius parameter  
Server Timeout: 5 Seconds  
Server Deadtime: 5 Minutes  
Server Retries: 3  
Server Key: *****
```

|

<b>radius-server host</b>	RADIUS
<b>radius-server retransmit</b>	RADIUS
<b>radius-server key</b>	RADIUS
<b>radius-server timeout</b>	RADIUS

|

|

-	-

radius

```
Ruijie# show radius server
server ip : 192.168.4.12
acct port: 23
authen port: 77
server state: ready
server ip : 192.168.4.13
acct port: 45
authen port: 74
server state: ready
```

<b>radius-server host</b>	RADIUS
<b>radius-server retransmit</b>	RADIUS



radius

```
Ruijie# show radius vendor-specific
id   vendor-specific      type-value
-----
1    max down-rate        76
2    qos                  77
3    user ip              3
4    vlan id              4
5    version to client    5
6    net ip               6
7    user name            7
8    password             8
```

RADIUS

---

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# 55 TACACS+

## 55.1 TACACS+

### 55.1.1 aaa group server tacacs+

TACACS+

TACACS+

```
aaa group server tacacs+ group-name
```

```
no aaa group server tacacs+ group-name
```

	<i>group-name</i>	TACACS+

```
TACACS+
```

```
TACACS+
```

```

tac1 TACACS+ 1.1.1.1
TACACS+
Ruijie(config)# aaa group server tacacs+ tac1
Ruijie(config-gs-tacacs)# server 1.1.1.1

```

<b>server</b>	TACACS+	server
<b>ip vrf forwarding</b>	TACACS+	VRF

-		-

## 55.1.2 ip tacacs source-interface

TACACS+

```
ip tacacs source-interface interface
```

```
no ip tacacs source-interface
```

Interface	TACACS+

TACACS+

```
TACACS+ TACACS+ nas ip TACACS+
```

```
TACACS+ fastEthernet 0/0 ip TACACS+
```

```
Ruijie(config)# ip tacacs source-interface fastEthernet 0/0
```

<i>vrf-name</i>	vrf
-----------------	-----

┌

TACACS+

TACACS+                      vrf

```

TACACS+                      VRF              vpn1
Ruijie(config)# aaa group server tacacs+ tac1
Ruijie(config-gs-radius)# server 1.1.1.1
Ruijie(config-gs-radius)# ip vrf forwarding vpn1
    
```

<b>aaa group server tacacs+</b>	TACACS+
<b>server</b>	TACACS+              server

┌

--	--

```
aaa group server tacacs+ TACACS+
tacacs-server
TACACS+
host
```

```
TACACS+
```

```
tac1 TACACS+ 1.1.1.1
TACACS+
Ruijie(config)# aaa group server tacacs+ tac1
Ruijie(config-gs-tacacs)# server 1.1.1.1
```

```
i [REDACTED] CS+)]TJ)/TT0 Tf+B.37( )Tj/}2_0 1 T50DF4724 331
```

┌

┌

TACACS+ AAA TACACS+  
**tacacs-server** TACACS+

┌

TACACS+  
 Ruijie(config)# **tacacs-server host** 192.168.12.1  
 Ruijie(config)# **tacacs-server host** 2001::1

┌

<b>aaa authentication</b>	AAA
<b>tacacs-server key</b>	TACACS+
<b>tacacs-server timeout</b>	TACACS+

┌

┌

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### 55.1.6 tacacs-server key

┌

TACACS+  
**tacacs-server key** [0 | 7] *string*  
**no tacacs-server key**

┌

<i>string</i>	
0   7	0 7

┌

┌

┌

TACACS+ TACACS+ TACACS+

	key	host	key
	TACACS+	aaa	
	Ruijie(config)# <b>tacacs-server key aaa</b>		
	<b>tacacs-server host</b>	TACACS+	
	<b>tacacs-server timeout</b>	TACACS+	
	-		-

### 55.1.7 tacacs-server timeout

	TACACS+
	<b>tacacs-server timeout <i>seconds</i></b>
	<b>no tacacs-server timeout</b>
	<i>seconds</i>
	1-1000
	5
	host
	timeout
	timeout
	10
	Ruijie(config)# <b>tacacs-server timeout 10</b>

<b>tacacs-server host</b>	TACACS+
<b>tacacs-server key</b>	TACACS+

	-	

## 55.2 TACACS+

### 55.2.1 debug tacacs+

TACACS+                      no                      TACACS+

**debug tacacs+**

**no debug tacacs+**

--	--

### 55.2.2 show tacacs

TACACS+

**show tacacs**

	-	-

|

|

|

TACACS+

```
Ruijie# show tacacs
Tacacs+ Server : 172.19.192.80/49
Socket Opens: 0
Socket Closes: 0
Total Packets Sent: 0
Total Packets Recv: 0
Reference Count: 0
```

<b>tacacs-server host</b>		TACACS+

|

	-	-

# 56 SSH

## 56.1 SSH

### 56.1.1 crypto key generate

crypto key generate {rsa | dsa}

rsa	RSA

SSH

---

	-	-
--	---	---

---

## 56.1.2 crypto key zeroize

SSH

**crypto key zeroize {rsa / dsa}**

<b>rsa</b>		RSA
<b>dsa</b>		DSA

---

---

---

SSH Server

SSH Server  
**no enable service ssh-server**

DISABLE

---

```
Ruijie# configure terminal  
Ruijie(config)# crypto key zeroize rsa
```



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┌

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┌

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SSH Server  
120s

show ip ssh SSH server

100s  
Ruijie# **configure terminal**  
Ruijie(config)# **ip ssh time-out 100**

show ip ssh	ssh-server

RGOS10.1

-	-

### 56.1.5 ip ssh version

SSH server no

ip ssh version {1 / 2}

no ip ssh version

┌

1	SSH Server SSH1
2	SSH Server SSH2

┌

SSH 1 2 SSH  
no ip ssh version

┌

SSH Server SSH SSH Server  
SSH1 SSH2 SSH 1 SSH 2  
2 ~~SSH~~ SSH

2

Ruijie# **configure terminal**

Ruijie(config)# **ip ssh version 2**

**show ip ssh**

SSH Server

RGOS10.1

	<b>Clear line vty</b> <i>line_number</i>	VTY
	RGOS10.1	
	-	-

## 56.2.2 show crypto key mypubkey

SSH Server

**show crypto key mypubkey {rsa/dsa}**

	<b>rsa</b>	RSA
	<b>dsa</b>	DSA

SSH Server

Ruijie# **show crypto key mypubkey rsa**

	<b>crypto key generate {rsa   dsa}</b>	DSA RSA

RGOS10.1

**show ip ssh**

-	-

└───

└───

SSH Server	SSH Server
r	SSH
SSH	

└───

Ruijie# **show ip ssh**

<b>ip ssh version {1   2}</b>	SSH Server
<b>ip ssh time-out time</b>	SSH Server
<b>ip ssh authentication-retries retry times</b>	SSH Server

└───

RGOS10.1

-	-

**56.2.4 show ssh**

SSH

**show ssh**

-	-

└───



# 57 CPU

## 57.1

### 57.1.1 cpu-protect cpu bandwidth *bandwidth\_value*

CPU

**cpu-protect cpu bandwidth *bandwidth\_value***

<i>bandwidth_value</i>	64 1000000(kbps)

S5760 CPU 100000kbps

CPU 2000 kbps

Ruijie# **configure terminal**

Ruijie(config)# **cpu-protect cpu bandwidth 2000**

Ruijie(config)#**end**

Ruijie# **show cpu-protect cpu**

%cpu port bandwidth: 2000(kpbs)

<b>cpu-protect type</b> packet-type <b>traffic-class</b> <i>traffic-class-num</i>	
<b>cpu-protect traffic-class id</b> <i>id_num</i> <b>bandwidth</b> <i>bandwidth_value</i>	
<b>cpu-protect traffic-class all bandwidth</b> <i>bandwidth_value</i>	

	-	-

### 57.1.2 cpu-protect mac-address storm-control enable *value*

#### cpu-protect mac-address storm-control enable *value*

<i>value</i>		200 51200

2000

-

```

CPU          2000 kbps
Ruijie#configure terminal
Ruijie(config)# cpu-protect mac-address storm-control enable 3000
Ruijie(config)#end
Ruijie# show cpu-protect mac-address storm-control
%MAC address storm control state: enable
%MAC address storm control rate: 3000(address/second)

```

	-	-

	-	-

### 57.1.3 cpu-protect traffic-class id *id\_num* bandwidth *bandwidth\_value*

**cpu-protect traffic-class id *id\_num* bandwidth *bandwidth\_value***

<i>id_num</i>	ID	0 7	
<i>bandwidth_value</i>		32	131072(kbps)

S5760            7            100000kbps            1000kbps

┌

┌

```

              7          312(kbps)
Ruijie#configure terminal
Ruijie(config)# cpu-protect traffic-class id 7 bandwidth 312
Ruijie(config)#end
Ruijie# show cpu-protect traffic-class id 7
%*****traffic class      bandwidth(kbps)*****
              7          312
    
```

<b>cpu-protect type</b> packet-type <b>traffic-class</b> <i>traffic-class-num</i>	
<b>cpu-protect traffic-class all bandwidth</b> <i>bandwidth_value</i>	

┌

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**57.1.4 cpu-protect traffic-class all bandwidth *bandwidth\_value***

**cpu-protect traffic-class id *id\_num* bandwidth *bandwidth\_value***

--	--

	<i>bandwidth_value</i>	32 131072(kbps)
--	------------------------	-----------------

S5760      7

## S5760

BPDU	6
ARP	5
TPP	6
802.1X	3
GVRP	3
RLDP	6
DHCP	2
Unknow_IPv6_mc	1
Know_IPv6_mc	1
Unknow_IPv4_mc	1
Know_IPv4_mc	1
UDP-Helper	0



|

| CPU

| CPU  
 Ruijie# **show cpu-protect cpu**  
 %cpu port bandwidth: 100000(kbps)

<b>show cpu-protect type</b> <i>packet-type</i>	
<b>show cpu-protect traffic-class id</b> <i>id_num</i>	<i>id_num</i> 0 7
<b>show cpu-protect traffic-class all</b>	

|

|

-	-

### 57.2.2 show cpu-protect traffic-class id id\_num

**show cpu-protect traffic-class id** *id\_num*

|

<i>idt_num</i>	0-7

|

|

|

| 1 CPU  
 Ruijie#show cpu-protect traffic-class id 1  
 %\*\*\*\*\*traffic class        bandwidth(kbps)\*\*\*\*\*



<b>show cpu-protect type <i>packet-type</i></b>	
<b>show cpu-protect traffic-class id id_num</b>	id_num                    0 7
<b>show cpu-protect cpu</b>	CPU

-	-

### 57.2.4 show cpu-protect type packet-type

**show cpu-protect type *packet-type***

-	-

```

S5760      show cpu-protect type all
%*****packet type      traffic-class*****
          bpdu           6
          arp            5
          tpp            6
          dot1x          3
          gvrp           3
          rldp           6
          dhcp           2
          unknown-ipv6-mc 1
          known-ipv6-mc  1
    
```

```

unknown-ipv4-mc      1
  known-ipv4-mc      1
    udp-helper        0
      dvmrp           5
        igmp          3
          icmp        5
            ospf      5
              pim     5
                rip   5
                  vrrp 5
                    mld 3
                      ns 5
                        error-ttl 0
                          error-hop-limit 0
                            local-telnet 5
                              local-snmp 5
                                local-http 5
                                  local-tftp 5
                                    local-other 5
                                      ipv4-uc 4
                                        ipv6-uc 4
                                          other 0

```

<b>show cpu-protect traffic-class id <i>id_num</i></b>	id_num            0 7
<b>show cpu-protect traffic-class all</b>	
<b>show cpu-protect cpu</b>	CPU

-	-

### 57.2.5 show cpu-protect mac-address storm-control

**show cpu-protect mac-address storm-control**

	-	-

|

|

|

| CPU  
Ruijie# **show cpu-protect mac-address storm-control**  
%MAC address storm control state: enable  
%MAC address storm control rate: 2000(address/second)

	-	-

|

	-	-

# 58 DAI

## 58.1 VLAN DAI

### 58.1.1 ip arp inspection vlan

*vlan-id* VLAN DAI *vlan-id* no VLAN  
DAI

**ip arp inspection vlan** *vlan-id*

**no ip arp inspection vlan** [*vlan-id*]



## 58.2

### 58.2.1 ip arp inspection trust

ip arp inspection trust                      no

ip arp inspection trust

no ip arp inspection trust

	-	-

┌

┌

	ARP	DAI	
	NFPP(	)	NFPP
/	DAI		<b>show ip arp inspection interface</b>

### 58.3.1 ip arp inspection limit-rate limit-rate

	ARP	ip arp inspection limit-rate
	no	
	ip arp inspection limit-rate {limit-rate   none }	
	no ip arp inspection limit-rate	
	none	
	limit-rate	1 2048
	15 ARP /	0
	DAI (Network Foundation Protection Policy)	
	VLAN 2 gigabitEthernet 0/2	10 ARP
	/	
	Ruijie(config)# ip arp inspection	
	Ruijie(config)# interface gigabitEthernet 0/2	
	Ruijie(config-if)# ip arp inspection limit-rate 10	
	-	-
	-	-
	-	-

### 58.4 DHCP Snooping

ARP	VLAN	DAI	ARP	DHCP Snooping
				.



**59**

**arp**

arp

**show anti-arp-spoofing**


|

|

|

```
Ruijie#show anti-arp-spoofing
      port      ip
      -----  -
      Fa0/1     192.168.1.1
```

<b>anti-arp-spoofing ip</b>	arp

|

-	-

# 60 IP Source Guard

## 60.1 IP Source Guard

### 60.1.1 ip source binding

IP no

[no] ip source binding *mac-address* **vlan** *vlan-id* *ip-address* **interface** *interface-id*

<i>mac-address</i>	MAC
<i>vlan-id</i>	vlan id
<i>ip-address</i>	IP
<i>interface-id</i>	

IP Source Guard DHCP

```

1
Ruijie# configure terminal
Ruijie(config)# ip source binding 0000.0000.0001 vlan 1 1.1.1.1
interface FastEthernet 0/1
Ruijie(config)# end
Ruijie# show ip source binding
MacAddress      IpAddress  Lease(sec)  Type   VLAN  Interface
-----
0000.0000.0001 1.1.1.1   infinite   static    1   FastEthernet 0/1
Total number of bindings: 1
    
```

--	--

<b>show ip source binding</b>		IP
-		-

## 60.2 IP Source Guard

### 60.2.1 ip verify source

IP Source Guard      **no**

[no] ip verify source [port-security]

<b>port-security</b>	IP Source Guard	IP+MAC
----------------------	-----------------	--------

IP Source Guard	IP
IP+MAC	
IP Source Guard	Trust
DHCP Snooping	IP Source Guard
DHCP Snooping	IP Source Guard

```

1 IP Source Guard
Ruijie# configure terminal
Ruijie(config)# interface fastEthernet 0/1
Ruijie(config-if)# ip verify source
Ruijie(config-if)# end

```



-	-

## 60.3 IP Source Guard

### 60.3.1 show ip source binding

IP

**show ip source binding** [*ip-address*] [*mac-address*] [**dhcp-snooping**] [**static**] [**vlan** *vlan-id*] [**interface** *interface-id*]

<i>ip-address</i>	ip
<i>mac-address</i>	mac
dhcp-snooping	
static	
<i>vlan-id</i>	vlan
<i>interface-id</i>	

└───┘

└───┘

└───┘

```

Ruijie# show ip source binding static
MacAddress  IpAddress  Lease(sec)  Type   VLAN  Interface
-----
0000.0000.0001 1.0.0.1  infinite   static    1  FastEthernet 0/1
Total number of bindings: 1
    
```

<b>ip source binding</b>	IP

|

---

|

---

-	-

|

---

|

---

-	-



**cpu-protect sub-interface {manage|protocol|route} percent percent\_vaule**

<i>percent_vaule</i>	1 100

(Manage)	30
(Route)	25
(Protocol)	45

└───┘

└───┘

Ruijie(config)# **cpu-protect sub-interface manage percent 60**

<b>cpu-protect sub-interface { manage   protocol   route } pps</b>	

└───┘

## 61.3 ARP

### 61.3.1 arp-guard attack-threshold

**arp-guard attack-threshold** {per-src-ip | per-src-mac | per-port} *pps*

### 61.3.2 arp-guard enable

ARP

**arp-guard enable**

-	-

ARP

NFPP

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# arp-guard enable
```

<b>nfp arp-guard enable</b>	ARP
<b>show nfpp arp-guard summary</b>	

-	-

### 61.3.3 arp-guard isolate-period

**arp-guard isolate-period** {seconds | permanent}

seconds	0 [30, 86400]
permanent	

0

└── NFPP

└──

```
Ruijie(config-nfpp)# arp-guard monitor-period 180
```



**show nfpp arp-guard summary**

	-	-

### 61.3.7 arp-guard scan-threshold

#### arp-guard scan-threshold *pkt-cnt*

	<i>pkt-cnt</i>	[1,9999]

	15	10
--	----	----

NFPP

10	15	ARP	MAC	IP
	MAC	IP	IP	

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# arp-guard scan-threshold 20
```

<b>nfpp arp-guard scan-threshold</b>	
<b>show nfpp arp-guard summary</b>	
<b>show nfpp arp-guard scan</b>	ARP
<b>clear nfpp arp-guard scan</b>	ARP

-	-

### 61.3.8 clear nfpp arp-guard hosts

**clear nfpp arp-guard hosts [vlan vid] [interface interface-id] [ip-address | mac-address]**

<i>vid</i>	
<i>interface-id</i>	
<i>ip-address</i>	IP
<i>mac-address</i>	MAC

└───┘

└───┘

└───┘

└───┘

VLAN 1      g 0/1  
 Ruijie# **clear nfpp arp-guard hosts vlan 1 interface g0/1**

<b>arp-guard attack-threshold</b>	
<b>nfpp arp-guard policy</b>	
<b>show nfpp arp-guard hosts</b>	

└───┘

-	-

**61.3.9 clear nfpp arp-guard scan**

ARP

**clear nfpp arp-guard scan**

-	-

└───┘

|

|

|

Ruijie# **clear nfpp arp-guard scan**

|

<b>arp-guard scan-threshold</b>	
<b>nfpp arp-guard scan-threshold</b>	
<b>show nfpp arp-guard scan</b>	ARP

|

|

-	-

### 61.3.10 nfpp arp-guard enable

ARP

**nfpp arp-guard enable**

|

-	-

|

ARP

|

|

ARP

ARP

|

Ruijie(config)# **interface G0/1**  
 Ruijie(config-if)# **nfpp arp-guard enable**

|

<b>arp-guard enable</b>	ARP
<b>show nfpp arp-guard summary</b>	

|

|

10.4	

### 61.3.11 nfpp arp-guard isolate-period

**nfpp arp-guard isolate-period** {*seconds* | **permanent**}

|

<i>seconds</i>	0 [30, 86400]
<b>permanent</b>	0

|

|

|

|

```
Ruijie(config)# interface G 0/1
Ruijie(config-if)# nfpp arp-guard isolate-period 180
```



**nfpp arp-guard policy** {per-src-ip | per-src-mac | per-port} *rate-limit-pps*  
*attack-threshold-pps*

<b>per-src-ip</b>	IP
<b>per-src-mac</b>	MAC
<b>per-port</b>	
<i>rate-limit-pps</i>	1 9999
<i>attack-threshold-pps</i>	1 9999

```
Ruijie(config)# interface G 0/1
Ruijie(config-if)# nfpp arp-guard policy per-src-ip 2 10
Ruijie(config-if)# nfpp arp-guard policy per-src-mac 3 10
Ruijie(config-if)# nfpp arp-guard policy per-port 50 100
```

<b>arp-guard attack-threshold</b>	
<b>arp-guard rate-limit</b>	
<b>show nfpp arp-guard summary</b>	
<b>show nfpp arp-guard hosts</b>	
<b>clear nfpp arp-guard hosts</b>	

10.4	
------	--

### 61.3.13 nfpp arp-guard scan-threshold

**nfpp arp-guard scan-threshold *pkt-cnt***

<i>pkt-cnt</i>	[1,9999]

	ARP	ARP
--	-----	-----

┌

┌

```
Ruijie(config)# interface G 0/1
Ruijie(config-if)# nfpp arp-guard scan-threshold 20
```

<b>arp-guard scan-threshold</b>	
<b>show nfpp arp-guard summary</b>	
<b>show nfpp arp-guard scan</b>	ARP
<b>clear nfpp arp-guard scan</b>	ARP

┌

10.4	

## 61.4 DHCP

### 61.4.1 dhcp-guard attack-threshold

**dhcp-guard attack-threshold { per-src-mac | per-port} *pps***

<b>per-src-mac</b>	MAC
<b>per-port</b>	

	<i>pps</i>	[1,9999]
--	------------	----------

	MAC	10	300
--	-----	----	-----

NFPP

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# dhcp-guard attack-threshold per-src-mac 15
Ruijie(config-nfpp)# dhcp-guard attack-threshold per-port 200
```

	<b>nfpp dhcp-guard policy</b>	
	<b>show nfpp dhcp-guard summary</b>	
	<b>show nfpp dhcp-guard hosts</b>	
	<b>clear nfpp dhcp-guard hosts</b>	

	-	-

### 61.4.2 dhcp-guard enable

DHCP

**dhcp-guard enable**

	-	-

DHCP

NFPP

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# dhcp-guard enable
```

<b>nfpp dhcp-guard enable</b>	DHCP
<b>show nfpp dhcp-guard summary</b>	

-	-

### 61.4.3 dhcp-guard isolate-period

**dhcp-guard isolate-period** {seconds | permanent}

<i>seconds</i>	0 [30, 86400]
<b>permanent</b>	0

0

NFPP

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# dhcp-guard isolate timeout 180
```

<b>nfpp dhcp-guard isolate-period</b>	



NFPP

**dhcp-guard rate-limit { per-src-mac | per-port} pps**

<b>per-src-mac</b>	MAC	
<b>per-port</b>		
<i>pps</i>	[1,9999]	

	MAC	5	150
--	-----	---	-----

NFPP

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# dhcp-guard rate-limit per-src-mac 8
Ruijie(config-nfpp)# dhcp-guard rate-limit per-port 100
```

---



NFPP


L


### 61.4.9 nfpp dhcp-guard isolate-period


L

L

L

L


L


## 61.4.10 nfpp dhcp-guard policy

**nfpp dhcp-guard policy { per-src-mac | per-port} rate-limit-pps attack-threshold-pps**

<b>per-src-mac</b>	MAC
<b>per-port</b>	
<i>rate-limit-pps</i>	1 9999
<i>attack-threshold-pps</i>	1 9999

┌

┌

┌

```
Ruijie(config)# interface G 0/1
Ruijie(config-if)# nfpp dhcp-guard policy per-src-mac 3 10
Ruijie(config-if)# nfpp dhcp-guard policy per-port 50 100
```

<b>dhcp-guard attack-threshold</b>	
<b>dhcp-guard rate-limit</b>	
<b>show nfpp dhcp-guard summary</b>	
<b>show nfpp dhcp-guard hosts</b>	
<b>clear nfpp dhcp-guard hosts</b>	

┌

10.4	

## 61.5 DHCPv6

## 61.5.1 dhcpv6-guard attack-threshold

**dhcpv6-guard attack-threshold** { **per-src-mac** | **per-port** } *pps*

<b>per-src-mac</b>	MAC
<b>per-port</b>	

	-	-

DHCPv6

NFPP

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# dhcpv6-guard enable
```

<b>nfpp dhcpv6-guard enable</b>		DHCPv6
<b>show nfpp dhcpv6-guard summary</b>		

	10.4	

### 61.5.3 dhcpv6-guard isolate-period

**dhcpv6-guard isolate-period** {*seconds* | **permanent**}

<i>seconds</i>	0	[30, 86400]
<b>permanent</b>		

0

NFPP



<b>show nfpp dhcpv6-guard summary</b>	
<b>show nfpp dhcpv6-guard hosts</b>	
<b>clear nfpp dhcpv6-guard hosts</b>	

└───┘

10.4	

### 61.5.5 dhcpv6-guard monitored-host-limit

**dhcpv6-guard monitored-host-limit** *number*

<i>number</i>	1
	4294967295

└───┘

1000

└───┘

NFPP

└───┘

1000 %ERROR The value that you  
 1000 configured is smaller than current monitored hosts 1000  
 please clear a part of monitored hosts.

└───┘

% NFPP\_DHCP\_GUARD-4-SESSION\_LIMIT: Attempt  
 to exceed limit of 1000 monitored hosts.

└───┘

Ruijie(config)# **nfpp**  
 Ruijie(config-nfpp)# **dhcp-guard monitored-host-limit 200**

<b>show nfpp dhcpv6-guard summary</b>	

10.4	

### 61.5.6 dhcpv6-guard rate-limit

**dhcpv6-guard rate-limit { per-src-mac | per-port} pps**

<b>per-src-mac</b>	MAC
<b>per-port</b>	
<i>pps</i>	[1,9999]

	MAC	5	150
--	-----	---	-----

NFPP

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# dhcpv6-guard rate-limit per-src-mac 8
Ruijie(config-nfpp)# dhcpv6-guard rate-limit per-port 100
```

<b>nfpp dhcpv6-guard policy</b>	
<b>show nfpp dhcpv6-guard summary</b>	

10.4	

### 61.5.7 clear nfpp dhcpv6-guard hosts

**clear nfpp dhcpv6-guard hosts** [*vlan vid*] [**interface** *interface-id*] [*mac-address*]

<i>vid</i>	
<i>interface-id</i>	
<i>mac-address</i>	MAC

└───┘

└───┘

└───┘

└───┘

VLAN 1     g 0/1

Ruijie# **clear nfpp dhcpv6-guard hosts vlan 1 interface g0/1**

<b>dhcpv6-guard attack-threshold</b>	
<b>nfpp dhcpv6-guard policy</b>	
<b>show nfpp dhcpv6-guard hosts</b>	

└───┘

10.4	

### 61.5.8 nfpp dhcpv6-guard enable

DHCPv6

**nfpp dhcpv6-guard enable**

-	-

└───┘

DHCPv6

|

|

DHCPv6

DHCP

|

```
Ruijie(config)# interface G0/1
Ruijie(config-if)# nfpp dhcpv6-guard enable
```

|

<b>dhcpv6-guard enable</b>	DHCPv6
<b>show nfpp dhcpv6-guard summary</b>	

|

|

10.4	

### 61.5.9 nfpp dhcpv6-guard isolate-period

**nfpp dhcpv6-guard isolate-period** {*seconds* | **permanent**}

|

<i>seconds</i>	0 [30, 86400]
<b>permanent</b>	

|

|

|

|

```
Ruijie(config)# interface G 0/1
Ruijie(config-if)# nfpp dhcpv6-guard isolate-period 180
```

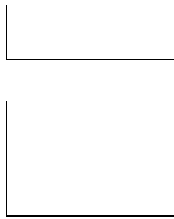
|

--	--

	<b>dhcpv6-guard isolate-period</b>	
	<b>show nfpp dhcpv6-guard summary</b>	

└──

Td(N9\* n4]T/C2\_0 1 Tf0 Tc02\_0 1 T1671.0.64 ref0.852 g30)11



10.4	

## 61.6 ICMP

### 61.6.1 icmp-guard attack-threshold

**icmp-guard attack-threshold { per-src-ip | per-port} pps**

<b>per-src-ip</b>	IP
<b>per-port</b>	
<i>pps</i>	[1,9999]

IP	1200	1500
----	------	------

NFPP



```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# icmp-guard attack-threshold per-src-ip 600
Ruijie(config-nfpp)# icmp-guard attack-threshold per-port 1200
```

<b>nfpp icmp-guard policy</b>	
<b>show nfpp icmp-guard summary</b>	
<b>show nfpp icmp-guard hosts</b>	
<b>clear nfpp icmp-guard hosts</b>	



-	-

### 61.6.2 icmp-guard enable

ICMP

**icmp-guard enable**

-	-

ICMP

NFPP

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# icmp-guard enable
```

<b>nfpp icmp-guard enable</b>	ICMP
<b>show nfpp icmp-guard summary</b>	

-	-

### 61.6.3 icmp-guard isolate-period

**icmp-guard isolate-period** {seconds | permanent}

--	--

<i>seconds</i>	0	[30, 86400]
<b>permanent</b>		

0

NFPP

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# icmp-guard isolate-period 180
```

<b>nfpp icmp-guard isolate-period</b>	
<b>show nfpp icmp-guard summary</b>	

-	-
---	---

### 61.6.4 icmp-guard monitor-period

**icmp-guard monitor-period** *seconds*

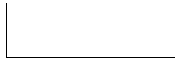
<i>seconds</i>	[180, 86400]
----------------	--------------

600

NFPP

> 0





exceed limit of 1000

monitored hosts.



## 61.6.8 clear nfpp icmp-guard hosts

**clear nfpp icmp-guard hosts** [*vlan vid*] [**interface** *interface-id*] [*ip-address*]

<i>vid</i>	
<i>interface-id</i>	
<i>ip-address</i>	IP

63.12f66.84 591.76 239.88 1.5 refBT/TT0 1 Tf104TT0 0410.5 142.32 578.1803 Tm( )Tj/C2\_0 1 Tf2

|

ICMP

|

|

ICMP

ICMP

|  
Ruijie(config)# **interface G0/1**  
Ruijie(config-if)# **nfpp icmp-guard enable**

<b>icmp-guard enable</b>	ICMP
<b>show nfpp icmp-guard summary</b>	

|

|  
10.4

10.4	

### 61.6.10 nfpp icmp-guard isolate-period

**nfpp icmp-guard isolate-period** {seconds | permanent}

|

seconds	0 [30, 86400]
permanent	

|

|

|

|  
Ruijie(config)# **interface G 0/1**  
Ruijie(config-if)# **nfpp icmp-guard isolate-period 180**

|



**icmp-guard isolate-period**

NFPP

	<b>show nfpp ip-guard hosts</b>	
	<b>clear nfpp ip-guard hosts</b>	
	10.4	

### 61.7.2 ip-guard enable

IP

#### ip-guard enable

	-	-

IP

NFPP

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# ip-guard enable
```

	<b>nfpp ip-guard enable</b>	IP
	<b>show nfpp ip-guard summary</b>	

	10.4	

### 61.7.3 ip-guard isolate-period

**ip-guard isolate-period** {*seconds* | **permanent**}

<i>seconds</i>	0	[30, 86400]
<b>permanent</b>		

0

NFPP

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# ip-guard isolate-period 180
```

<b>nfpp ip-guard isolate-period</b>	
<b>show nfpp ip-guard summary</b>	

10.4	

### 61.7.4 ip-guard monitor-period

**ip-guard monitor-period** *seconds*

<i>seconds</i>	[180, 86400]

600

NFPP

>

0

0

>

Ruijie(config)# **nfpp**

Ruijie(config-nfpp)# **ip-guard monitor-period 180**

<b>show nfpp ip-guard summary</b>	
<b>show nfpp ip-guard hosts</b>	
<b>clear nfpp ip-guard hosts</b>	

10.4	

## ard monitored-host-limit

d monitored-host-limit *number*

--	--

exceed limit of 1000

% NFPP\_IP\_GUARD-4-SESSION\_LIMIT: Attempt to  
monitored hosts.

<b>show nfpp ip-guard summary</b>	
10.4	

### 61.7.7 ip-guard scan-threshold

#### ip-guard scan-threshold *pkt-cnt*

<i>pkt-cnt</i>	[1,9999]

10 100

NFPP

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# ip-guard scan-threshold 20
```

<b>nfpp ip-guard scan-threshold</b>	
<b>show nfpp ip-guard summary</b>	

10.4	

### 61.7.8 ip-guard trusted-host

**ip-guard trusted-host** *ip mask*

**no ip-guard trusted-host** {**all** | *ip mask*}

<i>ip</i>	IP
<i>mask</i>	IP
<b>all</b>	no

|

|

|

|

```
VLAN 1    g 0/1
Ruijie# clear nfpp ip-guard hosts vlan 1 interface g0/1
```

|

<b>ip-guard attack-threshold</b>	
<b>nfpp ip-guard policy</b>	
<b>show nfpp ip-guard hosts</b>	

|

|

10.4	

### 61.7.10 nfpp ip-guard enable

IP

**nfpp ip-guard enable**

|

-	-

IP

~

1

<b>ip-guard enable</b>	IP
<b>show nfpp ip-guard summary</b>	

└───┘

NFPP

**nfpp ip-guard scan-threshold** *pkt-cnt*



	30	/	30	/	30
	NFPP				
	<pre>Ruijie(config)# nfpp Ruijie(config-nfpp)# nd-guard attack-threshold per-port ns-na 20 Ruijie(config-nfpp)# nd-guard attack-threshold per-port rs 10 Ruijie(config-nfpp)# nd-guard attack-threshold per-port ra-redirect 10</pre>				
	<b>nfpp nd-guard policy</b>				
	<b>show nfpp nd-guard summary</b>				
	10.4				

### 61.8.2 nd-guard enable

	ND				
	<b>nd-guard enable</b>				
	-		-		
	ND				
	NFPP				
	<pre>Ruijie(config)# nfpp</pre>				

```
Ruijie(config-nfpp)# nd-guard enable
```

<b>nfpp nd-guard enable</b>	ND
<b>show nfpp nd-guard summary</b>	

10.4	

### 61.8.3 nd-guard rate-limit

**nd-guard rate-limit per-port {ns-na | rs | ra-redirect} pps**

<b>ns-na</b>	
<b>rs</b>	
<b>ra-redirect</b>	
<i>pps</i>	[1,9999]

```
15 / 15
15 / 15
```

NFPP

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# nd-guard rate-limit per-port ns-na 10
Ruijie(config-nfpp)# nd-guard rate-limit per-port rs 5
Ruijie(config-nfpp)# nd-guard rate-limit per-port ra-redirect 5
```

<b>nfpp nd-guard policy</b>	



**nfpp nd-guard policy per-port {ns-na | rs | ra-redirect} rate-limit-pps attack-thresh  
old-pps**



(oldgu)4(pa )TJ/C2\_0 1 Tc 147906 -0.006 Td1B0F07CF2208349316>62C809AA16>661038D70CC88F

	10.4	
--	------	--

## 61.9 NFPP

### 61.9.1 clear nfpp log

NFPP

**clear nfpp log**

	-	-

└───

└───

└───

```
Ruijie# clear nfpp log
32 log-buffer entries were cleared.
```

	<b>show nfpp log</b>	NFPP

└───

	10.4	

### 61.9.2 log-buffer entries

NFPP

**log-buffer entries** *number*

--	--	--

<i>number</i>	[0,1024]
---------------	----------

256

NFPP

```

NFPP 50
Ruijie(config)# nfpp
Ruijie(config-nfpp)# log-buffer entries 50
    
```

<b>log-buffer logs</b> number_of_message interval length_in_seconds	NFPP

**show nfpp log** NFPP

```
number_of_message      1 length_in_seconds      30
```

NFPP

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# log-buffer logs 2 interval 12
```

log-buffer entries <i>number</i>	NFPP
show nfpp log summary	NFPP

10.4	

### 61.9.4 logging

NFPP      VLAN

**logging vlan** *vlan-range*

**logging interface** *interface-id*

<i>vlan-range</i>	VLAN 1-3,5
<i>interface-id</i>	

NFPP

VLAN

```

                VLAN 1  VLAN 2  VLAN 3  VLAN 5
Ruijie(config)# nfpp
Ruijie(config-nfpp)# logging vlan 1-3,5

                G 0/1
Ruijie(config)# nfpp
Ruijie(config-nfpp)# logging interface G 0/1
    
```

<b>show nfpp log summary</b>	NFPP

10.4	

### 61.9.5 show nfpp log

```

NFPP
show nfpp log summary
NFPP
show nfpp log buffer [statistics]
    
```

<b>statistics</b>	NFPP

```

    "_"

%NFPP_ARP_GUARD-4-DOS_DETECTED: Host<IP=N/A,MAC=0000.0000.0004,port=Gi4/1,VLAN=1> was detected.(2009-07-01 13:00:00)
    
```

NFPP

Ruijie#**show nfpp log summary**

Total log buffer size : 10

Syslog rate : 1 entry per 2 seconds

Logging:

VLAN 1-3, 5

interface Gi 0/1

interface Gi 0/2

NFPP

Ruijie#**show nfpp log buffer statistics**

There are 6 logs in buffer.

NFPP

Ruijie#**show nfpp log buffer**

Protocol	VLAN	Interface	IP address	MAC address	Reason
Timestamp					
-----					
ARP	1	Gi0/1	1.1.1.1	-	DoS
2009-05-30 16:23:10					
ARP	1	Gi0/1	1.1.1.1	-	ISOLATED
2009-05-30 16:23:10					
ARP	1	Gi0/1	1.1.1.2	-	DoS
2009-05-30 16:23:15					
ARP	1	Gi0/1	1.1.1.2	-	ISOLATE_FAILED
2009-05-30 16:23:15					
ARP	1	Gi0/1	-	0000.0000.0001	SCAN
2009-05-30 16:30:10					
ARP	-	Gi0/2	-	-	PORT_ATTACKED
2009-05-30 16:30:10					

Protocol

```

> ARP      ARP
> IP       IP
> ICMP     ICMP
> DHCP     DHCP
> DHCPv6   DHCPv6
> NS-NA    ND

```

```

> RS ND
> RA-REDIRECT ND

Reason 5
> DoS
> ISOLATED
> ISOLATE_FAILED
> SCAN
> PORT_ATTACKED
    
```

<b>clear nfpp log</b>	NFPP

10.4	

## 61.10 ARP

### 61.10.1 show nfpp arp-guard hosts

**show nfpp arp-guard hosts** [**statistics** | [[*vlan vid*] [**interface** *interface-id*] [*ip-address* | *mac-address*]]]

<b>statistics</b>	
<i>vid</i>	
<i>interface-id</i>	
<i>ip-address</i>	IP
<i>mac-address</i>	MAC

```

1
Ruijie# show nfpp arp-guard hosts statistics
success   fail    total
-----   ----   -----
100       20     120
          120          100          20
  
```

```

2
Ruijie# show nfpp arp-guard hosts
If column 1 shows '*', it means "hardware do not isolate user" .
VLAN interface IP address  MAC address    remain-time(s)
----  -
1     Gi0/1    1.1.1.1      -              110
2     Gi0/2    1.1.2.1      -              61
*3    Gi0/3    -            0000.0000.1111 110
4     Gi0/4    -            0000.0000.2222 61
Total 4 hosts
  
```

<b>clear nfpp arp-guard hosts</b>	

-	-

### 61.10.2 show nfpp arp-guard scan

ARP

```

show nfpp arp-guard scan [statistics | [[vlan vid] [interface interface-id] [ip-address] [mac-address]]]
  
```

<b>statistics</b>	ARP

*vid*

*interface-id*

<b>arp-guard scan-threshold</b>	
<b>nfpp arp-guard scan-threshold</b>	
<b>clear nfpp arp-guard scan</b>	ARP

3                    Rate-limit                    IP                    /                    MAC  
 /                    Attack-threshold                    -

<b>arp-guard attack-threshold</b>	
<b>arp-guard enable</b>	ARP
<b>arp-guard isolate-period</b>	
<b>arp-guard monitor-period</b>	
<b>arp-guard monitored-host-limit</b>	
<b>arp-guard rate-limit</b>	
<b>arp-guard scan-threshold</b>	
<b>nfpp arp-guard enable</b>	ARP
<b>nfpp arp-guard isolate-period</b>	
<b>nfpp arp-guard policy</b>	
<b>nfpp arp-guard scan-threshold</b>	

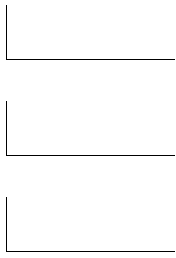
-	-

## 61.11 DHCP

### 61.11.1 show nfpp dhcp-guard hosts

**show nfpp dhcp-guard hosts** [statistics | [[vlan *vid*] [interface *interface-id*] [*mac-address*]]]

<b>statistics</b>	
<i>vid</i>	Qd0



Ruijie# **show nfpp dhcp-guard hosts statistics**

```

success    fail    total
-----    -
100         20     120
          120         100         20
  
```

remain-time(seconds)

Ruijie# **show nfpp dhcp-guard hosts**

If column 1 shows "\*", it means "hardware failed to isolate host".

```

VLAN  interface  MAC address  remain-time(seconds)
----  -
1     gi0/2      0000.0000.0001  10
*2    gi0/1      0000.0000.0002  20
Total 2 host(s)
  
```



<b>clear nfpp dhcp-guard hosts</b>	



10.4	

### 61.11.2 show nfpp dhcp-guard summary

**show nfpp dhcp-guard summary**

-	-

Ruijie# **show nfpp dhcp-guard summary**

Format of column Rate-limit and Attack-threshold is per-src-ip /per-src-mac/per-port.

Interface	Status	Isolate-period	Rate-limit	Attack-threshold
Global	Enable	300	-/5/150	-/10/300
Gi 0/1	Enable	180	-/6/-	-/8/-
Gi 0/2	Disable	200	-/5/30	-/10/50

Maximum count of monitored hosts: 1000

Monitor period 300s

- 1 . Interface Global
- 2 . Status
- 3 . Rate-limit IP / MAC
- / Attack-threshold -

<b>dhcp-guard attack-threshold</b>	
<b>dhcp-guard enable</b>	DHCP
<b>dhcp-guard isolate-period</b>	
<b>dhcp-guard monitor-period</b>	
<b>dhcp-guard monitored-host-limit</b>	
<b>dhcp-guard rate-limit</b>	
<b>nfpp dhcp-guard enable</b>	DHCP
<b>nfpp dhcp-guard isolate-period</b>	
<b>nfpp dhcp-guard policy</b>	



```

VLAN  interface  MAC address  remain-time(seconds)
----  -
1     gi0/2     0000.0000.0001  10
*2    gi0/1     0000.0000.0002  20
Total 2 host(s)
    
```

<b>clear nfpp dhcpv6-guard hosts</b>	

10.4	

### 61.12.2 show nfpp dhcpv6-guard summary

**show nfpp dhcpv6-guard summary**

-	-

```
Ruijie# show nfpp dhcpv6-guard summary
```

```

Format of column Rate-limit and Attack-threshold is per-src-ip
/per-src-mac/per-port.
    
```

```

Interface  Status  Isolate-period  Rate-limit  Attack-threshold
Global     Enable  300             -/5/150    -/10/300
Gi 0/1     Enable  180             -/6/-      -/8/-
Gi 0/2     Disable 200             -/5/30     -/10/50
    
```

```
Maximum count of monitored hosts: 1000
```

Monitor period 300s

```

1      Interface  Global
2      Status
3      Rate-limit      IP      /      MAC
      /      Attack-threshold      -
    
```

<b>dhcpv6-guard attack-threshold</b>	
<b>dhcpv6-guard enable</b>	DHCPv6
<b>dhcpv6-guard isolate-period</b>	
<b>dhcpv6-guard monitor-period</b>	
<b>dhcpv6-guard monitored-host-limit</b>	
<b>dhcpv6-guard rate-limit</b>	
<b>nfpp dhcpv6-guard enable</b>	DHCPv6
<b>nfpp dhcpv6-guard isolate-period</b>	
<b>nfpp dhcpv6-guard policy</b>	

10.4	

## 61.13 ICMP

### 61.13.1 show nfpp icmp-guard hosts

**show nfpp icmp-guard hosts** [**statistics** | [[**vlan** *vid*] [**interface** *interface-id*] [*ip-address*]]]

<b>statistics</b>	
<i>vid</i>	

<i>interface-id</i>	
<i>ip-address</i>	IP

Ruijie#**show nfpp icmp-guard hosts statistics**

```

success   fail   total
-----   ---   -----
100         20     120
                120           100           20
    
```

Ruijie# **show nfpp icmp-guard hosts**

If column 1 shows '\*', it means "hardware failed to isolate host".

```

VLAN  interface IP address      remain-time(s)
----  -
1     Gi0/1     1.1.1.1        110
2     Gi0/2     1.1.2.1        61
Total  2 host(s)
    
```

<b>clear nfpp icmp-guard hosts</b>	

10.4	

### 61.13.2 show nfpp icmp-guard summary

**show nfpp icmp-guard summary**

--	--

-	-
---	---

**Ruijie# show nfpp icmp-guard summary**

Format of column Rate-limit and Attack-threshold is per-src-ip /per-src-mac/per-port.

Interface	Status	Isolate-period	Rate-limit	Attack-threshold
Global	Enable	300	4/-/60	8/-/100
Gi 0/1	Enable	180	5/-/-	8/-/-
Gi 0/2	Disable	200	4/-/60	8/-/100

Maximum count of monitored hosts: 1000

Monitor period 300s

1	Interface	Global			
2	Status				
3	Rate-limit		IP	/	MAC /
			Attack-threshold		-

<b>icmp-guard attack-threshold</b>	
<b>icmp-guard enable</b>	ICMP
<b>icmp-guard isolate-period</b>	
<b>icmp-guard monitor-period</b>	
<b>icmp-guard monitored-host-limit</b>	
<b>icmp-guard rate-limit</b>	
<b>nfpp icmp-guard enable</b>	ICMP
<b>nfpp icmp-guard isolate-period</b>	
<b>nfpp icmp-guard policy</b>	

|

|

10.4	

### 61.13.3 show nfpp icmp-guard trusted-host

**show nfpp icmp-guard trusted-host**

|

-	-

|

|

|

```

Ruijie# show nfpp icmp-guard trusted-host
IP address      mask
-----
1.1.1.0         255.255.255.0
1.1.2.0         255.255.255.0
Total 2 record(s)
    
```

|

<b>icmp-guard trusted-host</b>	

|

|

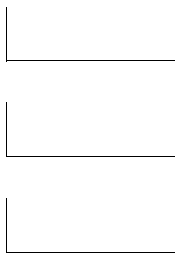
10.4	

## 61.14 IP

### 61.14.1 show nfpp ip-guard hosts

**show nfpp ip-guard hosts** [**statistics** | [[**vlan** *vid*] [**interface** *interface-id*] [*ip-address*]]]

<b>statistics</b>	
<i>vid</i>	
<i>interface-id</i>	
<i>ip-address</i>	IP



Ruijie#**show nfpp ip-guard hosts statistics**

```

success  fail  total
-----  ---  -----
100      20    120
                120          100          20
    
```

Ruijie#**show nfpp ip-guard hosts**

If column 1 shows '\*', it means "hardware do not isolate host".

```

VLAN  interface IP address  Reason  remain-time(s)
----  -
1     Gi0/1    1.1.1.1  ATTACK  110
    
```

NFPP

<b>ip-guard attack-threshold</b>	
<b>ip-guard enable</b>	IP
<b>ip-guard isolate-period</b>	
<b>ip-guard monitor-period</b>	
<b>ip-guard monitored-host-limit</b>	
<b>ip-guard rate-limit</b>	
<b>nfpp ip-guard enable</b>	IP
<b>nfpp ip-guard isolate-period</b>	

```
1.1.2.0      255.255.255.0
Total 2 record(s)
```

<b>ip-guard trusted-host</b>	

10.4	

## 61.15 ND

### 61.15.1 show nfpp nd-guard summary

**show nfpp nd-guard summary**

-	-

```
Ruijie# show nfpp nd-guard summary
```

```
Format of column Rate-limit and Attack-threshold is NS-NA/RS/R
A-REDIRECT.
```

Interface	Status	Rate-limit	Attack-threshold
Global	Enable	20/5/10	40/10/20
Gi 0/1	Enable	15/15/15	30/30/30
Gi 0/2	Disable	-/5/30	-/10/50

```
1 Interface Global
```

2	Status		
3	Rate-limit	/	/
		/	Attack-threshold
	-		
	-/5/30	G 0/2	/
	5	/	30

<b>nd-guard attack-threshold</b>	
<b>nd-guard enable</b>	ND
<b>nd-guard rate-limit</b>	
<b>nfpp nd-guard enable</b>	ND
<b>nfpp nd-guard policy</b>	

10.4	

# 62 ACL

id	IP ACL 1-99 1300-1999 IP ACL 100-199 2000-2699 MAC ACL 700-799 ACL 2700-2899
name	ACL
sn	ACL ( )
start-sn	
inc-sn	
deny	
permit	
prot	IPv6 ipv6 icmp tcp udp 0-255 IPv4 eigrp gre ipinip igmp nos ospf icmp udp tcp ip IP 0-255 icmp/tcp/udp
interface idx	
src	
src-wildcard	0.255.0.32
src-ipv6-pfix	IPv6
dst-ipv6-pfix	IPv6
pfix-len	
src-ipv6-addr	IPv6
dst-ipv6-addr	IPv6
dscp dscp	, 0-63
flow-label flow-label	0-1048575
dst	
dst-wildcard	0.255.0.32

precedence precedence	0-7
range	
time-range tm-rng-name	tm-rng-name
tos tos	0-15
cos cos	cos (0-7)
cos inner cos	tag cos
icmp-type	ICMP 0-255
icmp-code	ICMP 0-255
icmp-message	ICMP
operator port[port]	Operator lt- eq- gt- neq- range- port

B	MAC	6	P		35
C		12	Q	IP	36
D	VLAN tag	14	R	ip	38
E	DSAP( )	18	S	ip	42
F	SSAP( )	19	T	TCP	46
G	Ctrl	20	U	TCP	48
H	Org Code	21	V		50
I		24	W		54
J	IP	26	XY	IP	58
K	TOS	27	Z	flags	59
L	IP	28	a	Windows size	60
M	ID	30	b		62
N	Flags	32			

SNAP tag 802.3

## 62.1

### 62.1.1 access-list

no

1) IP 1 - 99 1300 - 1999

**access-list** *id* {deny | permit} {source source-wildcard | host source | any}

2) IP 100 - 199 2000 - 2699

**access-list** *id* {deny | permit} protocol {source source-wildcard | host source | any} {destination destination-wildcard | host destination | any} [precedence precedence] [tos tos] [fragments] [range lower upper] [time-range time-range-name]

3) MAC 700 - 799

**access-list** *id* {deny | permit} {any | host source-mac-address} {any | host destination-mac-address} [ethernet-type][cos [out][ inner in]]

## 4) Expert 2700 - 2899

**access-list** *id* {deny | permit} [protocol | [ethernet-type][ cos [out][ inner in]]] [VID [out][inner in]] {source source-wildcard | host source | any} {host source-mac-address | any} {destination destination-wildcard | host destination | any} {host destination-mac-address | any} [[precedence precedence] [tos tos] [fragments] [range lower upper] [time-range time-range-name]

> Ethernet-type cos

**access-list** *id* {deny | permit} {ethernet-type} cos [out][ inner in]] [VID [out][inner in]] {source source-wildcard | host source | any} {host source-mac-address | any } {destination destination-wildcard | host destination | any} {host destination-mac-address | any} [time-range time-range-name]

> Protocol

**access-list** *id* {deny | permit} protocol [VID [out][inner in]] {source source-wildcard | host source | any} {host source-mac-address | any } {destination destination-wildcard | host destination | any} {host destination-mac-address | any} [precedence precedence] [tos tos] [fragments] [range lower upper] [time-range time-range-name]

> Expert

**Internet Control Message Protocol (ICMP)**

**access-list** *id* {deny | permit} icmp [VID [out][inner in]] {source source-wildcard | host source | any} {host source-mac-address | any } {destination destination-wildcard | host destination | any} {host destination-mac-address | any} [ icmp-type ] [ [ icmp-type [icmp-code ] ] | [ icmp-message ] ] [precedence precedence] [tos tos] [fragments] [time-range time-range-name]

**Transmission Control Protocol (TCP)**

**access-list** *id* {deny | permit} tcp [VID [out][inner in]] {source source-wildcard | host Source | any} {host source-mac-address | any } [operator port [port] ] {destination destination-wildcard | host destination | any} {host destination-mac-address | any} [operator port [port] ] [precedence precedence] [tos tos] [fragments] [range lower upper] [time-range time-range-name] [match-all tcp-flag]

**User Datagram Protocol (UDP)**

**access-list** *id* {deny | permit} udp[VID [out][inner in]] {source source -wildcard | host source | any} {host source-mac-address | any } [ operator port [port] ] {destination destination-wildcard | host destination | any}{host destination-mac-address | any} [operator port [port] ] [precedence precedence] [tos tos] [fragments] [range lower upper] [time-range time-range-name]

## 5)

**access-list** *list-remark text*

<i>id</i>	1-99 100-199 1300-1999 2000-2699 2700 – 2899 700 - 799
<b>Deny</b>	
<b>Permit</b>	
<i>Source</i>	
<i>source-wildcard</i>	0.255.0.32
<i>protocol</i>	IP EIGRP GRE IPINIP IGMP NOS OSPF ICMP UDP TCP IP IP 0-255 ICMP/TCP/UDP
<i>Destination</i>	
<i>destination-wildcard</i>	0.255.0.32
<b>fragments</b>	
<b>precedence</b>	
<i>precedence</i>	0-7
<b>range</b>	
<i>lower</i>	
<i>upper</i>	
<b>time-range</b>	
<i>time-range-name</i>	
<b>tos</b>	
<i>tos</i>	0-15
<i>icmp-type</i>	ICMP 0-255
<i>icmp-code</i>	ICMP 0-255
<i>icmp-message</i>	ICMP
<i>operator</i>	lt- eq- gt- neq- range-
<b>port</b> [ <i>port</i> ]	<i>range</i>
<b>host</b> <i>source-mac-address</i>	
<b>host</b> <i>destination-mac-address</i>	
<b>VID</b> <i>vid</i>	<i>vid</i>
<i>ethernet-type</i>	

<b>match-all</b>	<i>tcp flag</i>
<i>tcp-flag</i>	tcp flag

ACL

**access-list**

- › dod-host-prohibited
- › dod-net-prohibited
- › echo
- › echo-reply
- › fragment-time-exceeded
- › general-parameter-problem
- › host-isolated
- › host-precedence-unreachable
- › host-redirect
- › host-tos-redirect
- › host-tos-unreachable
- › host-unknown
- › host-unreachable
- › information-reply
- › information-request
- › mask-reply
- › mask-request
- › mobile-redirect
- › net-redirect
- › net-tos-redirect
- › net-tos-unreachable
- › net-unreachable
- › network-unknown
- › no-room-for-option
- › option-missing
- › packet-too-big
- › parameter-problem
- › port-unreachable
- › precedence-unreachable
- › protocol-unreachable
- › redirect
- › router-advertisement
- › router-solicitation
- › source-quench
- › source-route-failed
- › time-exceeded
- › timestamp-reply
- › timestamp-request

---

```
>  ttl-exceeded
>  unreachable
      TCP          TCP
>  bgp
>  chargen
>  cmd
>  daytime
>  discard
>  domain
>  echo
>  exec
>  finger
>  ftp
>  ftp-data
>  gopher
>  hostname
>  ident
>  irc
>  klogin
>  kshell
>  login
>  nntp
>  pim-auto-rp
>  pop2
>  pop3
>  smtp
>  sunrpc
>  syslog
>  tacacs
>  talk
>  telnet
>  time
>  uucp
>  whois
>  www
      UDP          UDP
>  biff
>  bootpc
```

- › bootps
- › discard
- › dnsix
- › domain
- › echo
- › isakmp
- › mobile-ip
- › nameserver
- › netbios-dgm
- › netbios-ns
- › netbios-ss
- › ntp
- › pim-auto-rp
- › rip
- › snmp
- › snmptrap
- › sunrpc
- › syslog
- › tacacs
- › talk
- › tftp
- › time
- › who
- › xdmcp

## Ethernet-type

- › aarp
- › arp
- › appletalk
- › decnet-iv
- › diagnostic
- › etype-6000
- › etype-8042
- › lat
- › lavc-sca
- › mop-console
- › mop-dump
- › mumps
- › netbios

- > vines-echo
- > xns-idp

```
1 IP
   IP 192.168.1.64 - 192.168.1.127
```

```
Ruijie(config)# access-list 1 permit 192.168.1.64 0.0.0.63
```

```
2 IP
   IP      DNS      ICMP
```

```
Ruijie(config)# access-list 102 permit tcp any any eq domain
```

```
Ruijie(config)# access-list 102 permit udp any any eq domain
```

```
Ruijie(config)# access-list 102 permit icmp any any echo
```

```
Ruijie(config)# access-list 102 permit icmp any any echo-reply
```

```
3 MAC
   MAC 00d0f8000c0c 100
```

## 62.1.2 deny

(deny)

1 IP

[sn] deny {source source-wildcard 1

[sn] d{ } [(s)-8((s)8(du/C2)5-01007 T30000 Td (,)0571028(11P)4/02\_637.486)1j341p600-246

*destination-wildcard* | **host** *destination* | **any** {**host** *destination-mac-address* | **any**}  
**[time-range** *time-range-name*]

b) protocol

[*sn*] **deny protocol** [[**VID** [*out*][*inner in*]]] {*source source-wildcard* | **host source** | **any**}  
 {**host source-mac-address** | **any**} {*destination destination-wildcard* | **host destination** | **any**}  
 {**host destination-mac-address** | **any**} [**precedence** *precedence*] [**tos** *tos*] [**fragments**]  
**[range** *lower upper*] [~~**time-range**~~ *name*]

c) expert

> **Internet Control Message Protocol (ICMP)**

[*sn*] **deny icmp** [[**VID** [*out*][*inner in*]]] {*source source-wildcard* | **host source** | **any**} {**host**  
*source-mac-address* | **any**} {*destination destination-wildcard* | **host destination** | **any**} {**host**  
*destination-mac-address* | **any**} [*icmp-type*] [[*icmp-type* [*icmp-code* ]] | [*icmp-message*]]  
~~[**precedence** [*precedence*] [**tos** *tos*] [**frag-6** ( )] 931 Tf0(upper)c 0 Tw 2.571 0 Td[(icmp)-65 Tf2B3E3C02D6>Tj/TT0 1 T~~

[[*icmp-type* [*icmp-code*]] | [*icmp-message*]] [**dscp** *dscp*] [**flow-label** *flow-label*] [**fragments**] [**time-range** *time-range-name*]

› **Transmission Control Protocol (TCP)**

[*sn*] **deny tcp** {*source-ipv6-prefix* / *prefix-length* | **host** *source-ipv6-address* | **any**}[*operator* **port**[*port*]] {*destination-ipv6-prefix* /*prefix-length* | **host** *destination-ipv6-address* | **any**} [*operator* **port** [*port*]] [**dscp** *dscp*] [**flow-label** *flow-label*] [**fragments**] [**range** *lower upper*] [**time-range** *time-range-name*] [**match-all** *tcp-flag*]

› **User Datagram Protocol (UDP)**

[*sn*] **deny udp** {*source-ipv6-prefix/prefix-length* | **host** *source-ipv6-address* | **any**} [*operator* **port** [*port*]] {*destination-ipv6-prefix* /*prefix-length* | **host** *destination-ipv6-address* | **any**}[*operator* **port** [*port*]] [**dscp** *dscp*] [**flow-label** *flow-label*] [**fragments**] [**range** *lower upper*] [**time-range** *time-range-name*]

<i>Sn</i>	ACL
<i>source-ipv6-prefix</i>	IPv6
<i>destination-ipv6-prefix</i>	IPv6
<i>prefix-length</i>	
<i>source-ipv6-address</i>	IPv6
<i>destination-ipv6-address</i>	IPv6
<b>dscp</b>	
<i>dscp</i>	0-63.
<b>flow-label</b>	
<i>flow-label</i>	0-1048575
<i>protocol</i>	IPV6 <0-255> IPV6   icmp   tcp   udp



1

```
Ruijie(config)# ipv6 access-list extended v6-acl
Ruijie(config-ipv6-nacl)# 11 deny ipv6 host 192.168.4.12 any
Ruijie(config-ipv6-nacl)# show access-lists
ipv6 access-list extended v6-acl
11 deny ipv6 host 192.168.4.12 any
Ruijie(config-ipv6-nacl)# exit
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# ipv6 traffic-filter v6-acl in
```

<b>show access-lists</b>	
<b>ipv6 traffic-filter</b>	IPV6
<b>ip access-group</b>	IP ACL
<b>mac access-group</b>	MAC ACL
<b>ip access-list</b>	IP ACL
<b>mac access-list</b>	MAC ACL
<b>expert access-list</b>	ACL
<b>ipv6 access-list</b>	IPV6 ACL
<b>permit</b>	

V10.0

V10.0



	<b>in</b>	
--	-----------	--



**show expert access-lists**

1



**ip access-group**

fastEthernet0/0 120

Ruijie(config)# **interface fastEthernet**

**1           ACL**

```
Ruijie(config)# ip access-list standard std-acl
```

```
Ruijie(config-std-nacl)# show ip access-lists
```

```
ip access-list standard std-acl
```

```
Ruijie(config-std-nacl)#
```

**2           ACL**

```
Ruijie(config)# ip access-list extended 123
```

```
Ruijie(config-ext-nacl)# show ip access-lists
```

```
ip access-list extended 123
```



---

**show access-lists**

ACL

Ruijie# **show access-lists**

ip access-list standard 1

10 permit host 192.168.4.12

20 deny any any

Ruijie# **config**Ruijie(config)# **ip access-list resequence 1 21 43**Ruijie(config)# **exit**Ruijie# **show access-lists**

ip access-list standard 1

21 permit host 192.168.4.12

64 deny any any

---

<b>show access-lists</b>	

---

---

V10.0	V10.0

---

|

|

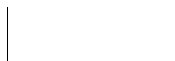
|

ACL  
**traffic-filter**

**show ipv6**

```
access-list v6-acl Gigabit 1
Ruijie(config)# interface GigaEthernet 0/1
Ruijie(config-if)# ipv6 traffic-filter v6-acl in
```

<b>show ipv6 access-lists</b>	IPV6



V10.0	V10.0

accept\_00d0f8xxxxxx\_only2\_0 1 T30 Tw 2.856 A.4970 .060(

### 62.1.10 MAC access-group

MAC ACL

no

**mac access-group** {*id* | *name*}{in |

V10.0	V10.0

### 62.1.11 MAC access-list

MAC ACL **no** ACL

**mac access-list extended** {*id* | *name*}

**no mac access-list extended** {*id* | *name*}

<i>id</i>	MAC 700-799
<i>name</i>	MAC

MAC ACL

#### show mac access-lists

1 MAC ACL

Ruijie(config)# **mac access-list extended** *mac-acl*

Ruijie(config-mac-nacl)# **show mac access-lists**

mac access-list extended *mac-acl*

2 MAC ACL

Ruijie(config)# **mac access-list extended** 704

Ruijie(config-mac-nacl)# **show mac access-lists**

mac access-list extended 704

<b>show mac access-lists</b>	mac

V10.0	V10.0



V10.0	V10.0

### 62.1.13 permit

#### (permit)

##### 1) IP

[sn] **permit** {*source source-wildcard* | **host** *source* | **any**}

##### 2) IP

[sn] **permit protocol** *source source-wildcard destination destination-wildcard* [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**range** *lower upper*] [**time-range** *time-range-name*]

#### IP

##### > Internet Control Message Protocol (ICMP)

[sn] **permit icmp** {*source source-wildcard* | **host** *source* | **any**} {*destination destination-wildcard* | **host** *destination* | **any**} [*icmp-type*] [[*icmp-type* [*icmp-code*]]] | [*icmp-message*] [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**time-range** *time-range-name*]

##### > Transmission Control Protocol (TCP)

[sn] **permit tcp** {*source source-wildcard* | **host** *source* | **any**} [*operator* **port** [*port*]] {*destination destination-wildcard* | **host** *destination* | **any**} [*operator* **port** [*port*]] [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**range** *lower upper*] [**time-range** *time-range-name*] [**match-all** *tcp-flag*]

##### > User Datagram Protocol (UDP)

[sn] **permit udp** {*source source-wildcard* | **host** *source* | **any**} [*operator* **port** [*port*]] {*destination destination-wildcard* | **host** *destination* | **any**} [*operator* **port** [*port*]]

a host o ild

Ethernet-type cos

[sn] **permit** {*ethernet-type*| **cos** [*out*] [*inner in*]} [**VID** [*out*][*inner in*]] {*source source-wildcard* | **host source** | **any**} {**host source-mac-address** | **any**} {*destination destination-wildcard* | **host destination** | **any**} {**host destination-mac-address** | **any**} [**time-range** *time-range-name*]

Protocol

[sn] **permit protocol** [**VID** [*out*][*inner in*]] {*source source-wildcard* | **host Source** | **any**} {**host source-mac-address** | **any**} {*destination destination-wildcard* | **host destination** | **any**} {**host destination-mac-address** | **any**} [**precedence precedence**] [**tos tos**] [**fragments**] [**range lower upper**] [**time-range** *time-range-name*]

Expert

› **Internet Control Message Protocol (ICMP)**

[sn] **permit icmp** [**VID** [*out*][*inner in*]] {*source source-wildcard* | **host source** | **any**} {**host source-mac-address** | **any**} {*destination destination-wildcard* | **host destination** | **any**} {**host destination-mac-address** | **any**}[ *icmp-type* ] [[*icmp-type icmp-code* ]] | [ *icmp-message* ] [**precedence precedence**] [**tos tos**] [**fragments**] [**time-range** *time-range-name*]

› **Transmission Control Protocol (TCP)**

[sn] **permit tcp** [**VID** [*out*][*inner in*]]{*source source-wildcard* | **host Source** | **any**} {**host source-mac-address** | **any**} [ *operator port* [*port*] ] {*destination destination-wildcard* | **host destination** | **any**} {**host destination-mac-address** | **any**} [ *operator port* [*port*] ] [**precedence precedence**] [**tos tos**] [**fragments**] [**range lower upper**] [**time-range** *time-range-name*] [**match-all tcp-flag**]

› **User Datagram Protocol (UDP)**

[sn] **permit udp** [**VID** [*out*][*inner in*]]{*source source-wildcard* | **host source** | **any**} {**host source-mac-address** | **any**} [ *operator port* [*port*] ] {*destination destination-wildcard* | **host destination** | **any**} {**host destination-mac-address** | **any**} [ *operator port* [*port*] ] [**precedenceprecedence**] [**tos tos**] [**fragments**] [**range lower upper**] [**time-range** *time-range-name*]

› **Address Resolution Protocol (ARP)**

[sn] **permit arp** {*vid vlan-id*} [**host source-mac-address** | **any**] [**host destination-mac-address** | **any**] {*sender-ip sender-ip-wildcard* | **host sender-ip** | **any**} {*sender-mac sender-mac-wildcard* | **host sender-mac** | **any**} {*target-ip target-ip-wildcard* | **host target-ip** | **any**}

5) IPV6

[sn] **permit protocol** {*source-ipv6-prefix / prefix-length* | **any** | **host source-ipv6-address**} {*destination-ipv6-prefix / prefix-length* | **any**} *hostdestination-ipv6-address*} [**dscp dscp**] [**flow-label flow-label**] [**fragments**] [**range lower upper**] [**time-range** *time-range-name*]

IPV6

> **Internet Control Message Protocol (ICMP)**

```
[sn] permit icmp {source-ipv6-prefix / prefix-length | any source-ipv6-address | host}
{destination-ipv6-prefix / prefix-length | host destination-ipv6-address | any} [icmp-type]
[[icmp-type [icmp-code]] | [icmp-message]] [dscp dscp] [flow-label flow-label][fragments]
[time-range time-range-name]
```

> **Transmission Control Protocol (TCP)**

```
[sn] permit tcp {source-ipv6-prefix / prefix-length | host source-ipv6-address | any}
[operator port [port]] {destination-ipv6-prefix / prefix-length | host destination-ipv6-address
| any} [operator port [port]] [dscp dscp] [flow-label flow-label] [fragments] [range lower
upper] [time-range time-range-name] [match-all tcp-flag]
```

> **User Datagram Protocol (UDP)**

```
[sn] permit udp {source-ipv6-prefix / prefix-length | host source-ipv6-address | any}
[operator port [port]] {destination-ipv6-prefix / prefix-length | host destination-ipv6-address
| any} [operator port [port]] [dscp dscp] [flow-label flow-label] [fragments] [range lower
upper] [time-range time-range-name]
```

deny	-

ACL

ACL                      ACL

```

1                                      Expert Extended ACL                      ACL                      IP
192.168.4.12                      MAC                      001300498272                      TCP
Ruijie(config)# expert access-list extended exp-acl
Ruijie(config-exp-nacl)# permit tcp host 192.168.4.12 host
0013.0049.8272 any any
Ruijie(config-exp-nacl)# deny any any any any
Ruijie(config-exp-nacl)# show access-lists
expert access-list extended exp-acl
10 permit tcp host 192.168.4.12 host 0013.0049.8272 any any
20 deny any any any any
Ruijie(config-exp-nacl)#
2                      IP                      ACL                                      IP                      192.168.4.12                                      TCP
```

100

1

```
Ruijie(config)# ip access-list extended 102
Ruijie(config-ext-nacl)# permit tcp host 192.168.4.12 eq 100 any
Ruijie(config-ext-nacl)# show access-lists
ip access-list extended 102
10 permit tcp host 192.168.4.12 eq 100 any
Ruijie(config-ext-nacl)# exit
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# ip access-group 102 in
```



```
Ruijie# show access-group
ip access-list standard ipstd3
Applied On interface GigabitEthernet 0/1.
ip access-list standard ipstd4
Applied On interface GigabitEthernet 0/2.
ip access-list extended 101
Applied On interface GigabitEthernet 0/3.
ip access-list extended 102
Applied On interface GigabitEthernet 0/8.
```

<b>ip access-group</b>	ip
<b>mac access-group</b>	MAC
<b>expert access-group</b>	Expert
<b>ipv6 traffic-filter</b>	IPV6

V10.0	V10.0

### 62.2.2 show access-lists

ACL                      ACL

**show access-lists** [*id* | *name*]

<i>id</i>	
<i>name</i>	

acl                      *id* *name*                      ACL

```
show access-list 13 T 9 0 0 9 62.34 790.4003 Tm<459 Tf0 Tcn_acl-0r00  
Ruijie# show access-lists
```

```
Ruijie# show expert access-group interface gigabitethernet 0/2
expert access-group ee in
Applied On interface GigabitEthernet 0/2.
```

<b>expert access-list</b>	Expert    ACL

V10.0	V10.0

### 62.2.4 show ip access-group

IP ACL

**show ip access-group**[interface <interface>] L

V10.0	V10.0
-------	-------

### 62.2.5 show ipv6 traffic-filter

IPV6

**show ipv6 traffic-filter** [interface <interface>]

<interface>	
-------------	--

IPv6 ACL

IPv6 ACL

```
Ruijie# show ipv6 traffic-filter interface gigabitethernet 0/4
ipv6 traffic-filter v6 in
Applied On interface GigabitEthernet 0/4.
```

ipv6 access-list	IPV6 ACL
------------------	----------

V10.0	V10.0
-------	-------

### 62.2.6 show mac access-group

MAC

**show mac access-group**[interface <interface>]

<interface>	
-------------	--

|

---

|

---

MAC ACL

MAC ACL

Ruijie# **show mac access-group interface gigabitethernet 0/3**

	<b>show secu-acl</b>	

└──

	V10.2	V10.2

### 62.3.2 security global access-group

**security global access-group** {*id*|*name*}

**no security global access-group**

	<i>id</i>	ACL id
	<i>name</i>	ACL

└──

└──

└──

Ruijie(config)#**security global access-group 1**

	<b>show secu-acl</b>	

└──

	V10.2	V10.2

### 62.3.3 security uplink enable

**security uplink enable**

**no security uplink enable**



```
Ruijie(config-if)#show secu-acl
```

# 63 QoS

## 63.1

```

QoS                               QoS
>                               1 policy-map
> policy-map                     class-map
> class-map                       1 ACL ACL ACE
>                               ACE " ACL"

```

QoS #Fb #d- 2011, Q 0f29677 >17.92T /4BT2411 1 Tf -0.001.943 0 Td <0Qo 62.34 6Qo 6

<b>CoS to DSCP</b>	<b>CoS</b>	<b>DSCP</b>
	0	0
	1	8
	2	16
	3	24
	4	32
	5	40
	6	48
	7	56

IP-Precedence to DSCP

<b>IP-Precede nce to DSCP</b>	<b>IP-Precedence</b>	<b>DSCP</b>
	0	0
	1	8
	2	16
	3	24
	4	32
	5	40
	6	48
	7	56

DSCP to CoS

<b>DSCP to CoS</b>	<b>DSCP</b>	<b>CoS</b>
	0	0
	8	1
	16	2
	24	3
	32	4
	40	5
	48	6
	56	7

-	
---	--

## 63.2

### 63.2.1 class maps

ACL

**ip access-list** {**extended** | **standard**} { *acl-id* | *acl-name* }

**mac access-list extended** {*acl-id* | *acl-name*}

**expert access-list extended** {*acl-id* | *acl-name*}

**ipv6 access-list extended** *acl-name*

```
4      class-map,   cm
Ruijie(config)# class-map cm
5      ACL
Ruijie(config-cmap)# match access-group me
6      class-map
Ruijie(config-cmap)# exit
```

---

<b>show mac access-lists</b>	-
------------------------------	---

---

	<b>show mls qos queueing</b>	-
	-	-

---

### 63.2.3 interface rate-limit

**rate-limit {input | output}**

QoS

---

	-	-
--	---	---

---

### 63.2.4 mls qos cos

CoS

**mls qos cos** *default-cos*

**no mls qos cos**

--	--	--

*default-cos*                      0 7

	<b>dscp</b>	
	<b>no</b>	

|

|

|

| Ruijie(config)# **mls qos map cos-dscp 8 10 16 18 24 26 32 34**

```
Ruijie(config)# mls qos mls qos
```

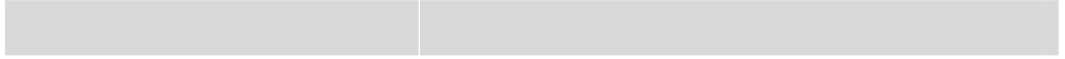
## 63.2.8 mls qos scheduler

**mls qos scheduler [sp | rr | wrr | drr]**

**no mls qos scheduler**



<b>cos</b>	Qos	CoS
<b>dscp</b>	Qos	DSCP



## 63.2.11 priority-queue

[no]

|

---

|

---

|

---

|

---

Ruijie(config)# **priority-queue cos-map 1 0 1**

|

---

<b>show mls qos queueing</b>	-

|

---

|

---

-	-

### 63.2.13 service-policy

policy map

**service-policy** {input | output} *policy-map-name*

**no service-policy** {input | output}

3.118Tj/C23E109E032Cr 10.02 0 0 10.02 241.86 606.2603 Tm<0A5104B8>Tj/T 0 0 100 Tc 0 Tr 3.012

---

**show mls qos interface**

-

QOS

```
Ruijie# show mls qos interface fastEthernet 0/1
```

-	-

-	-

### 63.3.4 show mls qos maps

dscp-cos maps, dscp-cos maps ip-prec-dscp maps

**show mls qos maps [cos-dscp | dscp-cos | ip-prec-dscp]**

<b>cos-dscp</b>	cos-dscp maps
<b>dscp-cos</b>	dscp-cos maps
<b>ip-prec-dscp</b>	ip-prec-dscp maps

dscp-cos maps dscp-cos maps ip-prec-dscp maps

```
Ruijie# show mls qos maps
```

-	-

-	-

### 63.3.5 show mls qos queueing

QoS (cos-to-queue map,wrr weight,drr weight)

**show mls qos queueing**

	-	-

└───

└───

└───

Ruijie# **show mls qos queueing**

	-	-

└───

	-	-

### 63.3.6 show mls qos rate-limit

**show mls qos rate-limit [interface *interface-id*]**

<b>interface</b>	<b>interface-id</b>	<b>rate-limit</b>

└───

└───

└───

```
Ruijie# show mls qos rate-limit
```

-	-

-	-

### 63.3.7 show mls qos scheduler

```
show mls qos scheduler
```

-	-

```
Ruijie# show mls qos scheduler
```

-	-

```
-
```

-	-



**show voice vlan**

Voice VLAN  
64-2

### 64.1.3 voice vlan cos

Voice VLAN                      CoS    **no**

**voice vlan cos** *cos-value*

**no voice vlan cos**

	<i>cos-value</i>	Voice VLAN                      CoS

*cos-value*    6

┌

Voice VLAN                      CoS    DSCP

1                      Voice VLAN                      CoS    5

Ruijie(config)# **voice vlan cos** 5



	<i>dscp-value</i>	Voice VLAN	DSCP
	<i>dscp-value</i>	46	
		Voice VLAN	CoS DSCP
	1	Voice VLAN	DSCP 40
	Ruijie(config)# <b>voice vlan dscp 40</b>		
	<b>show voice vlan</b>	Voice VLAN	
	-		
	10.4		

### 64.1.5 voice vlan enable

	Voice VLAN	Voice VLAN	<b>no</b>
	<b>voice vlan enable</b>		
	<b>no voice vlan enable</b>		

!

”



```
1      OUI      0012.3400.0000  Voice VLAN      Company A
Ruijie(config)# voice vlan mac-address 0012.3400.0000 mask
                ffff.ff00.0000 description Company A
```

1 Voice VLAN  
Voice VLAN Voice VLAN

2  
native VLAN Voice VLAN

3 Trunk Port/Hybrid Port VLAN  
Voice VLAN VLAN Voice  
VLAN Voice VLAN

N A L V e VC04012FCF>6<07CE02C8>6<0761182714D4>]TJ/

Voice VLAN OUI	MAC	MAC
	Voice VLAN	
	Voice VLAN	
	untagged	Voice VLAN tag
	MAC VLAN	Voice VLAN tag Voice VLAN /

1 Voice VLAN  
Ruijie(config)# voice vlan security enable

<b>show voice vlan</b>	Voice VLAN

[Redacted]

|

Voice VLAN

Voice VLAN

```

1          Voice VLAN
Ruijie(config)# show voice vlan
Voice VLAN status: ENABLE           //Voice VLAN
Voice VLAN ID: 2                    //Voice VLAN ID
Voice VLAN security mode: Security //
Voice VLAN aging time: 5 minutes   //
Voice VLAN cos: 6                   //      CoS
Voice VLAN dscp: 46                 //      DSCP
Current voice vlan enabled port mode: //      Voice VLAN
PORT                                MODE
-----
Fa0/1                               Auto
    
```

	Voice VLAN	Voice VLAN
<b>voice vlan</b> <i>vlan-id</i>	Voice VLAN VLAN	Voice VLAN
<b>voice vlan aging</b> <i>minutes</i>	Voice VLAN	
<b>voice vlan cos</b> <i>cos-value</i>	Voice VLAN	CoS
<b>voice vlan dscp</b> <i>dscp-value</i>	Voice VLAN	DSCP
<b>voice vlan enable</b>	Voice VLAN	
<b>voice vlan mode auto</b>	Voice VLAN	
<b>voice vlan security enable</b>	Voice VLAN	

10.4	
------	--

### 64.2.2 show voice vlan oui

OUI      OUI

show voice vlan oui

--	--	--

└───

└───



# 66 VRRP

## 66.1

### 66.1.1 vrrp authentication

VRRP no

vrrp group authentication *string*

no vrrp group authentication

<i>group</i>	VRRP
<i>string</i>	VRRP ( 8 )

	VRRP	VRRP
--	------	------

--	--

VRRP / VRRP	
r IPv6 VRRP	IPv6

VRRP 1  
vrrp 1 authentication x30dn78k

Ruijie(config-if)# vrrp group ip ipaddress [ secondary ]	VRRP IP
--	---------

--	--

--	--

	-	-
--	---	---

### 66.1.2 vrrp description

VRRP no

*vrrp group description text*

**no vrrp group description**

<i>group</i>	VRRP	
<i>text</i>	VRRP	

	VRRP	VRRP
--	------	------

	VRRP	VRRP
--	------	------

```

E0 VRRP 1 Building A – Marketing and
Administration
interface FastEthernet 0/0
ip address 10.0.1.1 255.255.255.0
vrrp 1 ip 10.0.1.20
vrrp 1 description "Building A - Marketing and Administration"
    
```

--	--	--



VRRP IPv6 VRRP IPv6 no

**vrrp group ipv6 ipv6-address**

**no vrrp group ipv6 ipv6-address**

<i>group</i>	VRRP
<i>ipv6-address</i>	IPv6

IPv6 VRRP

IPv6 VRRP IPv4 VRRP 1 255 VRRP IPv4 IPv6  
 IPv4 IPv4 IPv6

```

FastEthernet 0/0 IPv6 VRRP
VRRP 1 IPv6 FE80::1 2001::1
interface FastEthernet 0/0
no switchport
ipv6 enable
ip6 address 2001::2/64
vrrp 1 ipv6 FE80::1
vrrp 1 ipv6 2001::1
    
```

Ruijie# <b>show vrrp [ brief   group ]</b>	VRRP

RGOS10.4	RGOS10.4

### 66.1.5 vrrp preempt

VRRP

no

VRRP

**vrrp group preempt [delay seconds]**

**no vrrp group preempt [delay]**

<i>group</i>	VRRP
<b>delay seconds</b>	Master 0

VRRP

VRRP

VRRP

**vrrp group priority level**

**no vrrp group priority**

<i>group</i>	VRRP	
<i>level</i>	VRRP	

100 VRRP VRRP VRRP

VRRP

VRRP 1 254  
vrrp 1 priority 254

Ruijie(config-if)# <b>vrrp group ip ipaddress [ secondary ]</b>	VRRP	IP
Ruijie(config-if)# <b>vrrp group preempt [ delay seconds ]</b>	VRRP	

-	-	

### 66.1.7 vrrp timers advertise

VRRP no

**vrrp group timers advertise interval**

**no vrrp group timers advertise**

<i>group</i>	VRRP	
<i>interval</i>	VRRP	( )

VRRP VRRP  
VRR1/C2\_0 1 Tf0 T006 Tc 7.14 60 Td[<0<2FA64>54</TT0 1 Tf0 Tc 2.01.988Td

```

VRRP
VRRP
VRRP
Master
Master
VRRP

```

```

VRRP 1
vrrp 1 timers learn

```

Ruijie(config-if)# <b>vrrp group ip</b> <i>ipaddress</i> <b>[secondary]</b>	VRRP	IP
Ruijie(config-if)# <b>vrrp group timers advertise</b> <b>[msec]</b> <i>interval</i>	VRRP	

-	-
---	---

### 66.1.9 vrrp track

```

VRRP
IP
VRRP
vrrp group track interface-type number
vrrp group track ip-address
vrrp group track bfd
IP
no
BFD
vrrp group track [interface-type number | bfd interface-type interface-number ipv4-address]
[priority]
vrrp group track ipv4-address [interval interval-value] [timeout timeout-value] [priority]
vrrp

```

<i>ipv4-address</i>	IPv4	bfd
<i>ipv6-global-address</i>	IPv6	
<i>ipv6-linklocal-address</i>	IPv6	
<i>interval-value</i>	3	
<i>timeout-value</i>		1
<i>priority</i>		VRRP 10

IPv4                      VRRP                      VRRP  
                                IPv6

( Routed Port    SVI    Loopback    Tunnel    )  
                                IPv4                      IPv4                      IPv6  
                                IPv6

```

1                      VRRP    1    Routed Port Fa1/1                      Fa1/1
VRRP                      30    Fa1/1                      VRRP    1
vrrp 1 track FastEthernet 1/1 30
2                      1000::1
vrrp 1 track 1000::1
3                      VLAN 1                      FE80::1

```

```

vrrp 1 track FE80::1 vlan 1
#           VRRP           BFD                      192.168.1.3
Ruijie#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Ruijie(config)#interface FastEthernet 0/1
Ruijie(config-if)#no switchport
Ruijie(config-if)#ip address 192.168.1.1 255.255.255.0
Ruijie(config-if)#bfd interval 50 min_rx 50 multiplier 3
Ruijie(config)#interface FastEthernet 0/2

```

```
Ruijie(config-if)#no switchport
Ruijie(config-if)#ip address 192.168.201.17 255.255.255.0
Ruijie(config-if)#vrrp 1 priority 120
Ruijie(config-if)#vrrp 1 ip 192.168.201.1
Ruijie(config-if)#vrrp 1 track bfd FastEthernet 0/1 192.168.1.3 30
Ruijie(config-if)#end
```

---

```
Ruijie(config-if)# vrrp group
```

```

Ruijie# debug vrrp
Ruijie#
VRRP: Grp 1 Advertisement priority 120, ipaddr 192.168.201.213
VRRP: Grp 1 Event - Advert higher or equal priority
%VRRP-6-STATECHANGE: FastEthernet 0/0 Grp 1 state Master -> Backup
VRRP: Grp 1 Advertisement from 192.168.201.213 has invalid virtual
address 192.168.1.1
%VRRP-6-STATECHANGE: FastEthernet 0/0 Grp 1 state Backup -> Master
Ruijie#
    
```

Ruijie# debug vrrp errors	VRRP
Ruijie# debug vrrp events	VRRP
Ruijie# debug vrrp state	VRRP

-	-

### 66.2.2 debug vrrp errors

VRRP no

**debug vrrp errors**

**no debug vrrp errors**

-	-

VRRP

VRRP

Ruijie# debug vrrp errors

```
Ruijie#  
VRRP: Grp 1 Advertisement from 192.168.201.213 has invalid virtual  
address 192.168.1.1  
VRRP: Grp 1 Advertisement from 192.168.201.213 has invalid virtual  
address 192.168.1.1  
VRRP: Grp 1 Advertisement from 192.168.201.213 has invalid virtual  
address 192.168.1.1
```

-	-

-	-

### 66.2.3 debug vrrp events

VRRP no

debug vrrp events fD5>gSbQ ta f6 e6UEBA-RT8NS6d24BA-04CQ1@



VRRP: Grp 1 Advertisement priority 120, ipaddr 192.168.201.213

	-	-

	-	-

### 66.2.5 debug vrrp state

VRRP no

**debug vrrp state**

**no debug vrrp state**

	-	-

```
Ruijie#
```

-	-

-	-

## 66.3

### 66.3.1 show vrrp

VRRP

**show vrrp** [ *brief* | *group* ]

<b>brief</b>	VRRP
<i>group</i>	VRRP

VRRP

1 VRRP

```
Ruijie# show vrrp
```

```
FastEthernet 0/0 - Group 1
```

```
State is Backup
```

```
Virtual IP address is 192.168.201.1 configured
```

```
Virtual MAC address is 0000.5e00.0101
```

```
Advertisement interval is 3 sec
```

```
Preemption is enabled
```

```
min delay is 0 sec
```

```

Priority is 100
Master Router is 192.168.201.213 , pritority is 120
Master Advertisement interval is 3 sec
Master Down interval is 9 sec
FastEthernet 0/0 - Group 2
State is Master
Virtual IP address is 192.168.201.2 configured
Virtual MAC address is 0000.5e00.0102
Advertisement interval is 3 sec
Preemption is enabled
min delay is 0 sec
Priority is 120
Master Router is 192.168.201.217 (local), priority is 120
Master Advertisement interval is 3 sec
Master Down interval is 9 sec

```

2 VRRP

Ruijie# **show vrrp brief**

```

Interface  Grp Pri Time  Own Pre State  Master addr  Group addr
FastEthernet 0/0  1  100  -   -   P  Backup  192.168.201.213
192.168.201.1
FastEthernet 0/0  2  120  -   -   P  Master  192.168.201.217
192.168.201.2

```

Ruijie(config-if)# <b>vrrp group ip ipaddress</b> [ <b>secondary</b> ]	VRRP IP

-	-

	<i>type</i>	
	<i>number</i>	
	<b>brief</b>	

|

|

|

E1/0

VRRP

---

	Ruijie(config-if)# <b>vrrp group ip ip address</b> [ <b>secondary</b> ]	VRRP	IP
	-	-	

**67**

<b>bfd all-interfaces</b>	BFD
<b>clear bfd</b>	BFD
<b>ip ospf bfd</b>	OSPF BFD
<b>ip rip bfd</b>	RIP BFD



<b>10.3(4b3)</b>	

### 67.1.2 bfd all-interfaces

```
router (RIP,OSPF) bfd all-interfaces BFD
no
```

**bfd all-interfaces**

**no bfd all-interfaces**




6: 8



```

                                BFD
                                [no] bfd all-interfaces
                                BFD
                                ip ospf bfd [disable] ip rip bfd [disable]
                                OSPF RIP BFD
```



```
# OSPF BFD
Ruijie(config)# router ospf 123
```

```
Ruijie(config-router)# bfd all-interface
```

<b>bfd</b>	BFD
<b>ip ospf bfd</b>	OSPF BFD
<b>ip rip bfd</b>	RIP BFD

<b>10.3(4b3)</b>	

### 67.1.3 bfd cpp

**bfd cpp**                      BFD                      **no**                      BFD

**bfd cpp**

**no bfd cpp**

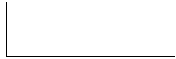
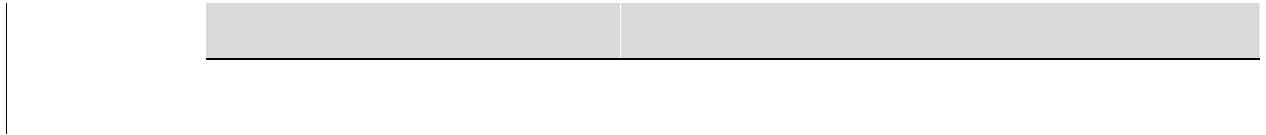

BFD

```

BFD
BFD
BFD
BFD
BFD
BFD
BFD
BFD
BFD

```

BFD



### 67.1.4 bfd echo





|

---

|

---

| # slow-timer 14000  
Ruijie(config)# bfd slow-timer 14000

<b>bfd echo</b>	BFD Echo

|

---

<b>10.3(4b3)</b>	

### 67.1.6 ip ospf bfd

```

                                BFD
                                ip ospf bfd [disable]
    OSPF      BFD
  
```

```

# Routed Port      FastEthernet 0/2      OSPF      BFD      .
Ruijie(config)# interface FastEthernet 0/2
Ruijie(config-if)# no switchport
Ruijie(config-if)# ip ospf bfd disable
  
```

<b>bfd</b>	BFD
<b>bfd all-interfaces</b>	BFD

└───

└───

```

RIP      BFD
          [no] bfd all-interfaces
          ip rip bfd [disable]

RIP      BFD

# Routed Port    FastEthernet 0/2      RIP      BFD
Ruijie(config)# interface
```

<b>vrf vrf-name</b>	( )	VRF
<b>interface-type interface-number</b>		
<b>gateway</b>	IP	BFD IP BFD
<b>gci fW ]d! UXXfYgg</b>	( )	BFD IP , IP

6 8

6 8

```

# BFD BFD 172.16.0.2
Ruijie(config)# interface FastEthernet 0/1
Ruijie(config-if)# no switchport
Ruijie(config-if)# ip address 172.16.0.1 255.255.255.0

```

### 67.1.9 ipv6 route static bfd

#### ipv6 route static bfd

BFD

**ipv6 route static bfd** [vrf vrf-name] interface-type interface-number  
 [source ipv6-address]

**no ipv6 route static bfd** [vrf vrf-name] interface-type interface-number  
 ipv6-address]

<b>vrf vrf-name</b>	( )
<b>interface-type interface-number</b>	
<b>gateway</b>	IP BFD
<b>gci fW `]dj *! UXXfYgg</b>	( ) BFD

6 8

r 6

```
# BFD
Ruijie(config)# interface Fa
Ruijie(config-if)# no switch
Ruijie(config-if)# ip addr
Ruijie(config-if)# bfd int
Ruijie(config-if)# ipv6 ro 1::2
Ruijie(config-if)# ipv6
```

---

<b>bfd</b>	BFD
E>	RGOS10.4E

### 67.1.10 neighbor fall-over bfd

router address-family , neighbor fall-over BGP BFD



r	=D	6 8
---	----	-----

```
# BFD BFD 172.16.0.2
Ruijie#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Ruijie(config)# route-map Example1 permit 10
Ruijie(config-route-map)# match ip address 1
Ruijie(config-route-map)# set ip precedence priority
Ruijie(config-route-map)#set ip next-hop verify-availability
172.16.0.2 bfd FastEthernet 0/1 172.16.0.2
Ruijie(config-route-map)#end
```

<b>bfd</b>	BFD

<b>10.3(4b3)</b>	

### 67.1.12 vrrp bfd

**vrrp bfd** VRRP BFD master  
**no**

**vrrp group-number bfd ip-address**

**no vrrp group-number bfd ip-address**

<i>group-number</i>	JFFD 6 8 aUghYf
<i>ip-address</i>	=D



6: 8

```

show bfd neighbors [vrf vrf-name] [ipv4 ip-address [details]] ipv6 ip-address
[details] | client {bgp|ospf|rip|vrrp|static-route} [ipv4 ip-address [details] | ipv6
ip-address [details]] details]]

```

<b>vrf</b> <i>vrf-name</i>	( )	VRF
<b>client</b>	( )	
<b>bgp</b>	BGP	BFD
<b>ospf</b>	OSPF	BFD
<b>rip</b>	RIP	BFD
<b>vrrp</b>	VRRP	BFD
<b>static-route</b>	StaticRoute	BFD
<b>pbr</b>	PBR	BFD
<b>ipv4</b> <i>ip-address</i>	IPv4	
<b>ipv6</b> <i>ip-address</i>	IPv6	

**details**

MinTxInt: 200000, MinRxInt: 200000, Multiplier: 5

Received MinRxInt: 50000, Received Multiplier: 3

Holdown (hits): 600(22), Hello (hits): 200(84453)

Rx Count: 49824, Rx Interval (ms) min/max/avg: 208/440/332

Tx Count: 84488, Tx Interval (ms) min/max/avg: 152/248/196

**Registered protocols: BGP**

Uptime: 02:18:49

Hello (hits)	1234
Rx Count	68
Rx Interval (ms) min/max/avg	
Tx Count	68
Tx Interval (ms) min/max/avg	
Registered protocols	
Uptime	1D
Last packet	68


<b>10.3(4b3)</b>	

# 68 RLDP

## 68.1

### 68.1.1 rldp detect-interval

RLDP

**rldp detect-interval** *interval*

**no rldp detect-interval**

	<i>interval</i>	2-15

3

**rldp detect-max** *num*

**no rldp detect-max**

<i>num</i>	,	2-10

2

5  
Ruijie(config)# **rldp detect-max 5**

<b>rldp detect-interval</b>	

-	-

### 68.1.3 rldp enable

RLDP

**rldp enable**

**no rldp enable**

--	--

	RLDP	RLDP
	Ruijie(config)# <b>rldp enable</b>	
	<b>rldp port</b>	RLDP
	-	-

### 68.1.4 rldp port

rldp

**rldp port { unidirection-detect | bidirection-detect | loop-detect } { warning | shutdown-svi | shutdown-port | block }**

**no rldp port { unidirection-detect | bidirection-detect | loop-detect }**

	<b>unidirection-detect</b>	
	<b>bidirection-detect</b>	
	<b>loop-detect</b>	
	<b>warning</b>	
	<b>shutdown-svi</b>	shutdown      svi
	<b>shutdown-port</b>	shutdown
	<b>block</b>	

	RLDP	RLDP
	fas 0/1	rldp

```
Ruijie(config)# interface fas 0/1  
Ruijie(config-if)# rldp port loop-detect block
```

<b>rldp enable</b>	rldp

## 68.2

### 68.2.1 show rldp

rldp

**show rldp [interface *interface-id*]**

	<i>Interface-id</i>	
	EXEC	
	-	-
	-	-

### 68.2.2 debug rldp

rldp

no

**debug rldp [packet | event | error]**

**undebug rldp [packet | event | error]**

	packet	rldp
	event	
	error	

└──

└── EXEC

└──

└──

└──

-	-

└──

└──

-	-

# 69 TCP

## 69.1 TCP

### 69.1.1 ip tcp path-mtu-discovery

TCP (PMTU) ip tcp  
**path-mtu-discovery no**  
**ip tcp path-mtu-discovery [age-timer {minutes | infinite}]**  
**no ip tcp path-mtu-discovery [age-timer {minutes | infinite}]**

	TCP	PMTU
<b>age-timer minutes</b>	10 30	10
<b>age-timer infinite</b>	TCP	PTMU

TCP



Foreign Address	“ ” “2002::2.23” “192.168.195.212.23” “23”
PMTU	PMTU
<b>ip tcp path-mtu-discovery</b>	TCP PMTU
<b>10.4</b>	

---

# 70

## 70.1

### 70.1.1 cd

`cd [filesystem:][directory]`

	<i>filesystem</i>	
	<i>directory</i>	

flash

cd / pwd

1 usb0  
Ruijie# **cd** usb0:/  
2 sd  
Ruijie# **cd** sd0:/

	pwd	


## 70.1.2 copy

**copy** *source-url destination-url*

<i>source-url</i>	URL
<i>destination-url</i>	URL

copy

URL

<b>flash:</b>	flash URL flash
<b>tftp:</b>	TFTP
<b>xmodem:</b>	xmodem
<b>slave:</b>	flash
<b>usb0:</b>	usb
<b>usb1:</b>	usb
<b>sd0:</b>	sd

r

/

URL

1 tftp

```

Ruijie#copy tftp://192.168.201.54/rgos.bin flash:/
  2          tftp
Ruijie#copy flash:/rgos.bin tftp://192.168.201.54/rgos.bin
  3          xmodem
Ruijie# copy xmodem: flash:/config.text
  4          U
Ruijie#copy flash:/config.text usb0:/config.text
  5
Ruijie#copy flash:/config.text slave:/config.text
  6          flash      sd
Ruijie#copy flash:/rgos.bin sd0:/rgos.bin
  7          U          sd
Ruijie#copy usb0:/config.text sd0:/config.text
  8          sd          U
Ruijie#copy sd0:/config.text usb0:/config.text

```

<b>del</b>	
<b>rename</b>	
<b>dir</b>	


### 70.1.3 delete

#### delete url

<i>url</i>	<i>url</i>



url

---

r

---

1

Ruijie# **dir** slave0:/

Directory of slave0:/

Mode	Link	Size	MTime	Name
1		10838016	2008-01-01 00:01:53	rgos.bin
1		399	2008-01-01 00:01:37	config.text
1		399	2008-01-01 00:17:58	cfg.txt

3 Files (Total size 11210782 Bytes), 0 Directories.

Total 33030144 bytes (31MB) in this device, 20463616 bytes (19MB) available.

2

Ruijie# **dir**

Directory of temp:/

Mode	Link	Size	MTime	Name
1		399	2008-01-01 00:17:58	a.dat

1 Files (Total size 399 Bytes), 0 Directories.

Total 33030144 bytes (31MB) in this device, 20463616 bytes (19MB) available.

<b>pwd</b>	
<b>cd</b>	

---

## 70.1.5 mkdir

### mkdir *directory*

<i>directory</i>	

|

|

( )

---

```
r      flash:/backup/temp      flash:/backup
      flash:/bakcup
      flash:/backup/temp
```

```
1      test
Ruijie# mkdir test

2      sd      test2
Ruijie# mkdir sd0:/test2
```

<b>rmdir</b>	
<b>pwd</b>	

|

--	--

---


### 70.1.6 rename

**rename** *url1 url2*

<i>url1</i>		URL
<i>url2</i>		URL


usb0/1, flash, slave

1 log.txt ,

---


## 70.1.7 rmdir

*rmdir directory*

	<i>directory</i>	,

└──

└──

└──

└──  
Ruijie# **rmdir** tmp

	<b>mkdir</b>	

└──


## 70.2

### 70.2.1 pwd

---

**pwd**



---

|

|

|

1  
Ruijie#show file systems

|


|

|




	-	-
	-	-

### 71.1.2 show cpu

	CPU	show cpu
	show cpu	
	-	-


	CPU	5	1	5
	CPU	5	1	5
	CPU			

#### show cpu

```

Ruijie# show cpu
=====
      CPU Using Rate Information
CPU utilization in five seconds: 25%
CPU utilization in one minute  : 20%
CPU utilization in five minutes: 10%
NO   5Sec  1Min  5Min  Process

```

---

5	0%	0%	0%	waitqueue_process
6	0%	0%	0%	tasklet_task
7	0%	0%	0%	kevents
8	0%	0%	0%	snmpd
9	0%	0%	0%	snmp_trapd
10	0%	0%	0%	mtdblock
11	0%	0%	0%	gc_task
12	0%	0%	0%	Context
13	0%	0%	0%	kswapd
14	0%	0%	0%	bdflush
15	0%	0%	0%	kupdate
16	0%	3%	1%	ll_mt
17	0%	0%	0%	ll main process
18	0%	0%	0%	bridge_relay
19	0%	0%	0%	dlx_task
20	0%	0%	0%	secu_policy_task
21	0%	0%	0%	dhcpa_task
22	0%	0%	0%	dhcpsnp_task
23	0%	0%	0%	igmp_snp
24	0%	0%	0%	mstp_event
25	0%	0%	0%	GVRP_EVENT
26	0%	0%	0%	rldp_task
27	0%	2%	1%	reup_task
28	0%	0%	0%	reup_event_handler
29	0%	0%	0%	tpp_task
30	0%	0%	0%	ip6timer
31	0%	0%	0%	rtadvd
32	0%	0%	0%	tnet6
33	2%	0%	0%	tnet
34	0%	0%	0%	Tarptime
35	0%	0%	0%	gra_arp
36	0%	0%	0%	Ttcptimer
37	8%	1%	0%	ef_res
38	0%	0%	0%	ef_rcv_msg
39	0%	0%	0%	ef_inconsistent_daemon
40	0%	0%	0%	ip6_tunnel_rcv_pkt
41	0%	0%	0%	res6t
42	0%	0%	0%	tunrt6
43	0%	0%	0%	ef6_rcv_msg

---

44	0%	0%	0%	ef6_inconsistent_daemon
45	0%	0%	0%	imid
46	0%	0%	0%	nsmd
47	0%	0%	0%	ripd
48	0%	0%	0%	ripngd
49	0%	0%	0%	ospfd
50	0%	0%	0%	ospf6d
51	0%	0%	0%	bgpd
52	0%	0%	0%	pimd
53	0%	0%	0%	pim6d
54	0%	0%	0%	pdmd
55	0%	0%	0%	dvmrpd
56	0%	0%	0%	vty_connect
57	0%	0%	0%	aaa_task
58	0%	0%	0%	Tlogtrap
59	0%	0%	0%	dhcp6c
60	0%	0%	0%	sntp_recv_task
61	0%	0%	0%	ntp_task
62	0%	0%	0%	sla_daemon
63	0%	3%	1%	track_daemon
64	0%	0%	0%	pbr_guard
65	0%	0%	0%	vrrpd
66	0%	0%	0%	psnpd
67	0%	0%	0%	igsnpd
68	0%	0%	0%	coa_recv
69	0%	0%	0%	co_oper
70	0%	0%	0%	co_mac
71	0%	0%	0%	radius_task
72	0%	0%	0%	tac+_acct_task
73	0%	0%	0%	tac+_task
74	0%	0%	0%	dhcpd_task
75	0%	0%	0%	dhcps_task
76	0%	0%	0%	dhcpping_task
77	0%	0%	0%	dhcpc_task
78	0%	0%	0%	uart_debug_file_task
79	0%	0%	0%	ssp_init_task
80	0%	0%	0%	rl_listen
81	0%	0%	0%	ikl_msg_operate_thread
82	0%	0%	0%	bcmDPC

83	0%	0%	0%	bcmL2X.0	
84	3%	3%	3%	bcmL2X.0	
85	0%	0%	0%	bcmCNTR.0	
86	0%	0%	0%	bcmTX	
87	0%	0%	0%	bcmXGS3AsyncTX	
88	0%	2%	1%	bcmLINK.0	
89	0%	0%	0%	bcmRX	
90	0%	0%	0%	mngpkt_rcv_thread	
91	0%	0%	0%	mngpkt_recycle_thread	
92	0%	0%	0%	stack_task	
93	0%	0%	0%	stack_disc_task	
94	0%	0%	0%	redun_sync_task	
95	0%	0%	0%	conf_dispatch_task	
96	0%	0%	0%	devprob_task	
97	0%	0%	0%	rdp_snd_thread	
98	0%	0%	0%	rdp_rcv_thread	
99	0%	0%	0%	rdp_slot_change_thread	
100	4%	2%	1%	datapkt_rcv_thread	
101	0%	0%	0%	keepalive_link_notify	
102	0%	0%	0%	rerp_msg_rcv_thread	
103	0%	0%	0%	ip_scan_guard_task	
104	0%	0%	0%	ssp_ipmc_hit_task	
105	0%	0%	0%	ssp_ipmc_trap_task	
106	0%	0%	0%	hw_err_snd_task	
107	0%	0%	0%	rerp_packet_send_task	
108	0%	0%	0%	idle_vlan_proc_thread	
109	0%	0%	0%	cmic_pause_detect	
110	1%	1%	1%	stat_get_and_send	
111	0%	1%	0%	rl_con	
112	75%	80%	90%	idle	
		3	5	1	5
	CPU	LISR	HISR		CPU

No	
5Sec	5 CPU
1Min	1 CPU
5Min	5 CPU



---

bgp

---

/

---

1 BGP  
Ruijie(config)# **memory-lack exit-policy bgp**

<b>show memory</b>	

-

10.3(4b3)	

## 71.2.2 show memory

**show memory**

**show memory**

--	--

Free pages: 1079

watermarks : min 379, lower 758, low 1137, high 1516

System Total Memory : 128MB, Current Free Memory : 5283KB

Used Rate : 96%

1. 4k

2.

min	
lower	<b>memory-lack exit-policy</b>
low	OVERFLOW
high	OVERFLOW

3.

-	-

-	-

--	--

/

BGP,OSPF,RIP,LDP,PIM,ISIS

1 show memory protocols  
 Ruijie(config)# **show memory protocols**

```

=====
protocol      |memory(byte)
BGP           |102000000
OSPF          |24000000
RIP           |10000000
PIM           |50000000
LDP           |20000000
-----
Total         |206000000
  
```

<b>show memory</b>	

-

10.3(4b3)	

---

# 72

## 72.1

### 72.1.1 clear logging

clear logging

	-	-

|

|

|

|

Ruijie# clear logging

	logging on	
	show logging	
	logging buffered	

|

	-	-

### 72.1.2 more flash

FLASH

---

**more flash:filename**



<i>levell</i>	0 7
---------------	-----

4k Bytes  
7

**show logging**

clear logging  
FLASH

Syslog Server

8

Emergencies	0	
Alerts	1	
Critical	2	
Errors	3	
warnings	4	
Notifications	5	
informational	6	
Debugging	7	

0

6

6

10000

Ruijie(config)# **logging buffered 10000 6**

<b>logging on</b>	
<b>show logging</b>	
<b>clear logging</b>	

	-	-

## 72.1.4 logging console

no

**logging console level**

**no logging console**

		0 7
<i>level</i>		1

Debugging (7)

**show logging**

6  
Ruijie(config)# **logging console informational**

	<b>logging on</b>	
	<b>show logging</b>	

	-	-

---

## 72.1.5 logging count

no

**logging count**

**no logging count**

	-	-

|

|

|

**no logging count**

|

Ruijie(config)# **logging count**

<b>show logging count</b>		
<b>show logging</b>		

|

	-	-

## 72.1.6 logging facility

no

(23)

**logging facility** *facility-type*

**no logging facility**

<i>facility-type</i>	Syslog
----------------------	--------

Local7(23)

2 Syslog

Numerical Code	Facility
0	kernel messages
1	user-level messages
2	mail system
3	system daemons
4	security/authorization messages
5	messages generated internally by syslogd
6	line printer subsystem
7	network news subsystem
8	UUCP subsystem
9	clock daemon
10	security/authorization messages
11	FTP daemon
12	NTP subsystem
13	log audit
14	log alert
15	clock daemon
16	local use 0 (local0)
17	local use 1 (local1)
18	local use 2 (local2)
19	local use 3 (local3)
20	local use 4 (local4)
21	local use 5 (local5)
22	local use 6 (local6)
23	local use 7 (local7)

(local7) 23

Syslog kernel

Ruijie(config)# logging facility kern

logging console	

-	-

### 72.1.7 logging file flash

FLASH

FLASH

no

logging file flash:filename [max-file-size] [level]

no logging file

Filename	txt
max-file-size	128K 6M bytes
level	FLASH 6
	1

FLASH

Syslog Server

FLASH

txt

---

r

FLASH  
FLASH logging file flash

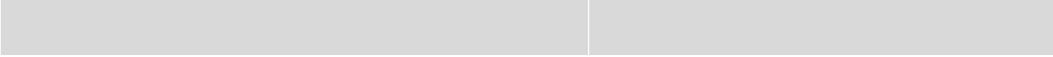
FLASH

---

VTY

6

Ruijie(config)# **logging monitor informational**



<b>logging</b>	Syslog Server
<b>logging file flash:</b>	FLASH
<b>logging console</b>	
<b>logging monitor</b>	VTY ( telnet )
<b>logging trap</b>	Syslog Server

-	-

### 72.1.10 logging rate-limit

no

**logging rate-limit** {*number* | *all number* | *console* {*number* | *all number*}} [*except severity*]

**no logging rate-limit**

<i>number</i>	1—10000
<i>all</i>	0—7
<i>console</i>	
<i>except</i>	error(3) error
<i>severity</i>	0—7

---

debug 10 warning

Ruijie(config)#**logging rate-limit all 10 except warnings**

<b>show logging count</b>	
<b>show logging</b>	

```

2                IPV6        AAAA:BBBB::FFFF
Ruijie(config)# logging server ipv6 AAAA:BBBB::FFFF

```

<b>logging on</b>	
<b>show logging</b>	
<b>logging trap</b>	syslog server

-	-

## 72.1.12 logging source ip| ipv6

no

**logging source** {ip *ip-address* | ipv6 *ipv6-address*}

**no logging source** {ip | ipv6}

<i>ip-address</i>	IPV4	IPV4
<i>ipv6-address</i>	IPV6	IPV6

Syslog Server

```

Loopback 0      Syslog
Ruijie(config)# logging source ip 192.168.1.1

```

---

	<b>logging</b>	Syslog server

	-	-
--	---	---

## 72.1.14 logging synchronous

no

**logging synchronous**

**no logging synchronous**

	-	-

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```
Ruijie(config)#line console 0
Ruijie(config-line)#logging synchronous
                        UP-DOWN
Ruijie#configure terminal
Oct  9 23:40:55 %LINK-5-CHANGED: Interface GigabitEthernet 0/1,
changed state to down
Oct  9 23:40:55 %LINEPROTO-5-UPDOWN: Line protocol on Interface
GigabitEthernet 0/1, changed state to DOWN
Ruijie# configure terminal //
```

	<b>show running-config</b>	

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## 72.1.15 logging trap

---

## Syslog Server

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**service sequence-numbers**

**no service sequence-numbers**

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Ruijie(config)# **service sequence-numbers**

	<b>logging on</b>	
	<b>service timestamps</b>	

|

	-	-

## 72.1.17 service sysname

no

**service sysname**

**no service sysname**

	-	-

|

```

Mar 22 15:28:02 %SYS-5-CONFIG: Configured from console by console
Ruijie# config terminal
Enter configuration commands, one per line. End with CNTL/Z.
Ruijie(config)# service sysname
Ruijie(config)# end
Mar 22 15:35:57 S3250 %SYS-5-CONFIG: Configured from console by
console

```

<b>show logging</b>	

-	-

## 72.1.18 service timestamps

no

default

**service timestamps** *message-type* [*uptime* | *datetime* [*msec* | *year*]]

**no service timestamps** *message-type*

**default service timestamps** *message-type*

--	--

<i>msec</i>	Jul 27 16:53:07.299
<i>year</i>	2007 Jul 27 16:53:07

RTC

Uptime  
Datetime

Log            Debug            Datetime

```
Ruijie(config)# service timestamps debug datetime msec
Ruijie(config)# service timestamps log datetime msec
Ruijie(config)# end
Ruijie(config)# Oct 8 23:04:58.301 %SYS-5-CONFIG_I: Configured from
console by console
```

<b>logging on</b>	
<b>service sequence-numbers</b>	

-	-

## 72.1.19 terminal monitor

```

VTY
no
terminal monitor
terminal no monitor

```



---

**show logging**

```
Ruijie# show logging
Syslog logging: enabled
Console logging: level debugging, 4 messages logged
Monitor logging: level informational, 0 messages logged
Buffer logging: level debugging, 6 messages logged
Timestamp debug messages: datetime
Timestamp log messages: disabled
Sequence log messages: enable
Trap logging: level debugging, 2 message lines logged,0 reserved,0
fail
logging to 202.101.11.22
logging to 192.168.200.112
Log Buffer (Total 4096 Bytes) : have written 680
00001 2004-11-17 10:20:59 Ruijie: %7:%LINK CHANGED: Interface
FastEthernet 0/0, changed state to up
00002 2004-11-17 10:20:59 Ruijie: %7:%LINE PROTOCOL CHANGE:
Interface FastEthernet 0/0, changed state to UP
00003 2004-11-17 10:57:18 Ruijie: %7:%LINK CHANGED: Interface
FastEthernet 0/1, changed state to administratively down
00004 2004-11-17 10:57:21 Ruijie: %7:%LINK CHANGED: Interface
FastEthernet 0/1, changed state to down
00005 2004-11-17 10:57:41 Ruijie: %7:%LINK CHANGED: Interface
FastEthernet 0/1, changed state to administratively down
00006 2004-11-17 10:57:43 Ruijie: %7:%LINK CHANGED: Interface
FastEthernet 0/1, changed state to down
```

Trap logging	Syslog Server
Log Buffer	

logging on	
clear logging	

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### 72.2.2 show logging count

show logging count

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**logging count**      **lunt**      **logging count**      **show**  
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	<b>logging count</b>	
	<b>show logging</b>	
	<b>clear logging</b>	
	-	-

---

---

# 73

## 73.1

### 73.1.1 device-description

**device-description** [*member member*] *description*

<i>member</i>	1-MAX, .
<i>description</i>	31,

SWITCH

**show member**

142.3[939.88 1.5 refBT/TT0 1 Tf8T0 1 Td-giant -6(er)]T3/TT0 1 Tf-0.00030 To



```
Ruijie(config)# member 2
Ruijie@2(config)# exit
Ruijie(config)#
```

-	-

-	-

### 73.1.4 stack

**stack {on | off} [copper | fiber]**

on	
off	
copper	
fiber	

,

, : : - - ID

```
2 gigabitEthernet 0/3
Ruijie(config)# interface gigabitEthernet 2/0/3
Ruijie(config-if)# stack on
```

--	--

	<b>show stack interface</b>	
	S2900	switch port
	-	-

**73.1.5 synchronize**

**synchronize flash: *filename***

	<i>filename</i>	

! 1

## 73.2.1 show member

show member [member]

<i>member</i>	1-MAX, .

|

|

|

Member	Mac Address	Priority	Software Ver	Hardware Ver
Description				
-----	-----	-----	----	-----
1	00d0.f822.3100	1	RGOS 10.1 1.0	SWITCH
2	00d3.f822.33aa	1	RGOS 10.1 1.0	SWITCH
3	00d3.f824.33ac	1	RGOS 10.1 1.0	SWITCH
4	00d3.f824.33b2	1	RGOS 10.1 1.0	SWITCH
5	00d3.f824.33b4	1	RGOS 10.1 1.0	SWITCH
6	00d3.f824.33b6	1	RGOS 10.1 1.0	SWITCH
7	00d3.f824.33b8	1	RGOS 10.1 1.0	SWITCH
8	00d0.f822.8803	8	RGOS 10.1 1.0	SWITCH

|

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-	-

## 73.2.2 show stack interface

**show stack interface**

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Member	Interface	Running Status	Configure Status	Status	Type
-----	-----	-----	-----	-----	-----
1	Gi1/0/1	active	stack on	up	copper
1	Gi1/0/24	active	stack on	up	fiber
2	Gi2/0/1	active	stack on	up	copper
2	Gi2/0/24	active	stack on	up	fiber
3	Gi3/0/1	active	stack on	up	copper
3	Gi3/0/24	active	stack on	up	fiber
4	Gi4/0/1	active	stack on	up	copper
4	Gi4/0/24	active	stack on	up	fiber
5	Gi5/0/1	active	stack on	up	copper
5	Gi5/0/24	active	stack on	up	fiber
6	Gi6/0/1	active	stack on	up	copper
6	Gi6/0/24	active	stack on	up	fiber
7	Gi7/0/1	active	stack on	up	copper
7	Gi7/0/24	active	stack on	up	fiber
8	Gi8/0/1	active	stack on	up	copper
8	Gi8/0/48	active	stack on	up	fiber

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