



RG-S5760

RGOS 10.4(2)

©2010



RGOS[®] 10.4(2)

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,
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1.

Courier New

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2.

Arial

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

3.

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/

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1.

2.

3.

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

```

show aliases	

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>

```


enable secret	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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	-	-

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>		
0 7	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>	
0 5	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 ip
telnet source-interface

ip telnet source-interface *interface-name*

<i>interface-name</i>	IP Telnet

┌
└

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└

IP Telnet telnet
 Telnet
no ip telnet source-interface

Loopback 1 IP Telnet
 Ruijie(config)# **ip telnet source-interface** *Loopback 1*

telnet	Telnet

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└

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└

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	

|

|

-	-

2.1.11 lockable

	lock	lock	line	lockable
	lock	no		

lockable

no lockable

-	-

└──

└──

line

└──

EXEC

lock

└──

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

└──

lock	

login

no login

	-	-

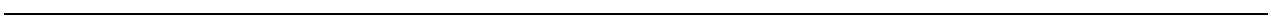
|

| line

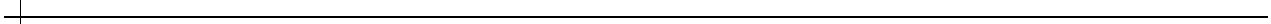
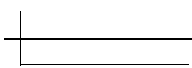
| AAA
| VTY console

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

password		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**

username	

-	-

2.1.15 privilege mode

CLI

-	-

CLI

CLI

CLI

CLI

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--	---	---

2.1.16 password

line line **password** **no** line

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

no password

	<i>password</i>	line

service password-encryption

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

┌

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telnet		
r	/ipv6	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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ip telnet source-interface	IP Telnet
show session	TTY
exit	

┌

┌

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2.1.19 username

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

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

2.2.2 banner motd

	no banner motd	banner motd
	banner motd <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

```

show boot system	

-

-	-

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
```

|

show clock	

|

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2.2.5 clock update-calendar

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clock update-calendar

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|

calendar

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



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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
```

|

minutes	
output	

|

```
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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```

[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]

```

boot config	
copy	
show running-config	

-	-

2.3

2.3.1 show clock

show clock

show clock

-	-

detail

show clock

```

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

```

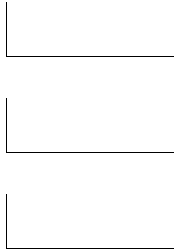
clock set	
-	-

2.3.2 show line

show line

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

console	
aux	aux
vty	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
```

-	-

-	-

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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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

-	-

-	-

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*]

aux		
console		
tty		
vty		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	VTY	no
line vty line-number		
no line vty line-number		
	-	-
	VTY	5 0--4
	VTY	
1	VTY	20 VTY 0--19
Ruijie(config)# line vty 19		
2	VTY	10 VTY 0—9
Ruijie(config)# line vty 10		
	-	-
	-	-

3.1.4 transport input

Line	transport input	Line
default transport input	LINE	
transport input {all ssh telnet none}		
default transport input		
all	Line	
ssh	Line	SSH

LINE

telnet	Line	Telnet
none	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

```

show running	
---------------------	--

RGOS10.1

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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
```

-	-

-	-

4.1.2 ping ipv6

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

<i>ip-address</i>	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
  
```

	-	-
	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

-	-

--	--	--

- -

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

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5.1.2 clear counters

clear counters [*interface-id*]

	<i>interface-id</i>	

|

|

	show interfaces	clear
counters		

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

	show interfaces	

|

	-	-

5.1.3 clear interface

clear interface *interface-id*

	<i>interface-id</i>	

|

┌

┌

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

┌

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

┌

shutdown	

┌

┌

-	-

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**

┌

show interfaces	

	-	-

5.1.5 duplex

no

duplex {auto | full | half}

no duplex

	auto	
	full	
	half	

└──

└──

└──

show interfaces

└──

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

--	--	--

no

flowcontrol {auto | off | on}

no flowcontrol

auto	
off	
on	

└───┘

└───┘

└───┘

show interfaces

└───┘

1/1

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

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

show interfaces	

└───┘

-	-

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)#
```

|

show interfaces	

|

-

|

-	-

5.1.8 interface fastEthernet

|

interface fastEthernet *mod-num/port-num*

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

	show interfaces	

┌

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5.1.9 interface giagbitEthernet

interface gigabitEthernet *mod-num/port-num*

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

┌

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10G

interface tenGigabitEthernet *mod-num/port-num*

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

|

|

|

no **show interfaces** **show interfaces**
tenGigabitEthernet

|

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

|

show interfaces	

|

|

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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

snmp trap link-status

no snmp trap link-status



Link SNMP LinkTrap

Ap SVI LinkTrap

1 Link trap

```
Ruijie(config)# interface gigabitEthernet 1/1
```

2 Link trap

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

```
Ruijie(config)# interface gigabitEthernet 1/1
```

```
Ruijie(config-if)# snmp trap link-status
```



	-	-
	2	
	switchport	
	2	2 3
	Ruijie(config-if)# switchport	
	show interfaces	
	-	
	-	-

5.1.19 switchport access

	no	access port	VLAN
		VLAN	
	switchport access vlan <i>vlan-id</i>		
	no switchport access vlan		
	<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
```

switchport mode	switch port
switchport trunk	trunkport native VLAN Trunk VLAN

-	-

5.1.20 switchport mode

trunk port, 802.1Q switch port access port
no

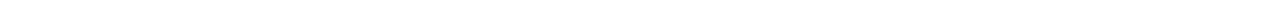
switchport mode {access | trunk}

no switchport mode

access	switch port access port
trunk	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
counters	
description	link
status	
switchport	

shutdown	
speed	
switchport priority	802.1q
switchport protected	

-	-

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

dst-mac		MAC		AP
		MAC		
		MAC		
src-mac		MAC		AP
		MAC		
		MAC		
src-dst-ip	IP	IP		IP—
	IP			IP—
	IP			
dst-ip		IP		AP
	IP			
src-ip		IP		AP
		IP		
		IP		
src-dst-mac	MAC	MAC		
	MAC—	MAC		
	MAC—	MAC		

MAC

show aggregateport load-balance

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

show aggregateport load-balance	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
--	------

	show vlan	vlan
--	------------------	------

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

	show vlan	VLAN

--	--	--

	-	-

7.1.2 switchport access

no access port VLAN VLAN

switchport access vlan *vlan-id*

no switchport access vlan

access	switch port	access port
trunk	switch port	trunk port
hybrid	switch port	hybrid port

no switchport trunk {allowed vlan | native vlan }

allowed vlan <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		
native vlan <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 Status Ports

1 VLAN0001 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
```

show supervlan	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
```

show supervlan		supervlan

-		-

8.1.3 supervlan

VLAN **supervlan**

supervlan

no supervlan

-		-

|

| VLAN

| end Ctrl+C
| exit

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

show supervlan	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

1wzP...avgjTm,V...ArcB...NMTcB...NR...08N



┌
└
┌
└
┌
└

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

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

┌
└
┌
└

RGOS10.1

-	-

9.1.3 protocol-vlan profile num vlan id

profile

┌
└
┌
└
┌
└
┌
└

<i>num</i>	profile
<i>id</i>	VLAN ID 1- VLAN

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

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

RGOS10.1



Protocol VLAN

	-	-
--	---	---

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

no private-vlan mapping

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

|

Primary VLAN

|

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

show vlan private-vlan	-

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

	show vlan private-vlan	-
	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
	no	VLAN

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

primary	primary VLAN
community	community VLAN
isolated	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

no	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

|

no	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

	no	

┌

┌

┌

```
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
```

	show frame-tag tpid	-

┌

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
```

show vlan private-vlan	-

RGOS10.1

-	-

11.1.4 switchport mode uplink

uplink

switchport mode uplink

no switchport mode

no	uplink

uplink

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

	show vlan private-vlan	-
	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
address-bind 3.3.3.3 00d0.f811.1112

┌
show address-bind

┌
-

┌
-

-	-

13.1.2 address-bind install

/

address-bind install

no address-bind install



|

|

|

IP MAC IP IP
 MAC 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
```

show mac-address-table dynamic	

-	-

13.1.7 clear mac-address-table filtering

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

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

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

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

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

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



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**

show mac-address-table aging-time	

show mac-address-table filtering

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

clear mac-address-table filtering	
show mac-address-table filtering	

-	-

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]

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



show mac-address-table static	
clear mac-address-table static	

-

-	-

13.1.13 snmp trap mac-notification

MAC no

snmp trap mac-notification {added | removed}

no snmp trap mac-notification {added | removed}

added	
removed	

show mac-address-table notification *interface*

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

mac-address-table notification	MAC
show mac-address-table notification	MAC

--	--

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
```

|

address-bind	

|

|

-	-

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
```

clear mac-address-table filtering	
mac-address-table filtering	

|

-	-

13.2.8 show mac-address-table interface

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

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

interface <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
```

mac-address-table notification	MAC
snmp trap mac-notification	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

mac-address-table static	
clear mac-address-table static	

-	-

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
r	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
```

```
0.9T2 09.22d( )62 357W* n3>T8 Tcg714.48r9j/T610 18T 0 315357fQ3>T8 Tcg71410
```

	show ip dhcp snooping	DHCP snooping
	-	-

14.1.2 ip dhcp snooping bootp-bind

DHCP Snooping Bootp
no DHCP snooping Bootp

[no] ip dhcp snooping bootp-bind

--	--	--


```

-----

```

show ip dhcp snooping	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
    
```


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
    
```

show ip dhcp snooping	DHCP snooping

-	-

14.2.2 ip dhcp snooping suppression

suppression no
no suppression

[no] ip dhcp snooping suppression

-	-

┌

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┌

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	DHCP	TRUST	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
```

┌

ip dhcp snooping binding	DHCP snooping
clear ip dhcp snooping binding	DHCP snooping

┌

┌

--	--

DHCP Snooping

debug ip dhcp snooping {event | packet}

15 IGMP Snooping

15.1

15.1.1 deny

	profile	profile	deny
deny			
	deny	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)# deny		
	ip igmp profile	profile	
	range		
	-	-	

15.1.2 permit

profile profile permit profile

permit

permit	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**

ip igmp profile	profile
range	

	1
-	-

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>	
	<i>profile</i>	
	<i>profile</i>	<i>profile deny</i>
	<i>profile</i>	<i>profile</i>
	<i>224.2.2.2~224.2.2.244</i>	<i>profile</i>
	Ruijie(config)# ip igmp profile 1	
	Ruijie(config-profile)# range 224.2.2.2 224.2.2.244	
	ip igmp profile	<i>profile</i>
	deny	<i>profile deny</i>
	permit	<i>profile permit</i>
	-	-

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

```

IGMP Profiles                               SVGL
IGMP Filtering                               profile
profile
    
```

```

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

range	profile	
permit	profile	permit
deny	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
    
```

ip igmp snooping svgl	igmp snooping	svgl
ip igmp snooping ivgl-svgl	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
    
```

```

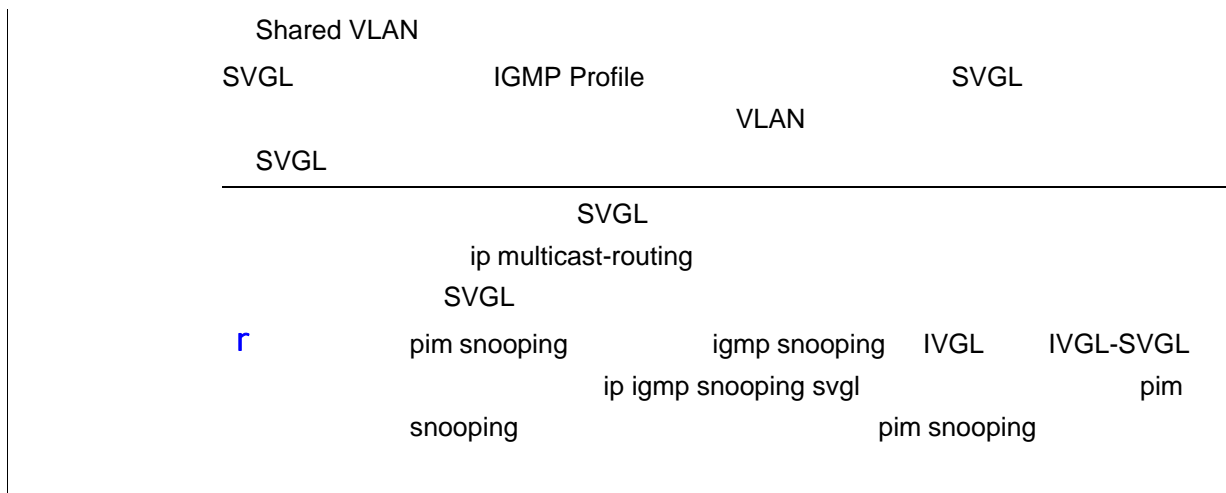
    
```

```

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
    
```

ip igmp snooping svgl vlan	Shared VLAN
ip igmp snooping svgl profile	SVGL profile

-	-

15.1.8 ip igmp snooping vlan

```

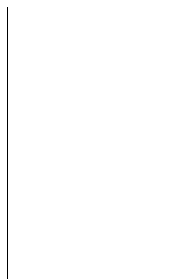
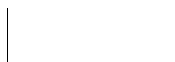
vlan          igmp snooping          ivgl          ip igmp
snooping vlan      no          igmp snooping

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
    
```

ip igmp snooping svgl	igmp snooping svgl
ip igmp snooping ivgl-svgl	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
    
```

<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

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

-	-

15.1.12 ip igmp snooping fast-leave enable

enable igmp snooping no igmp snooping fast-leave **ip 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	
ip igmp snooping source-check default-server	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 suppression IGMPv3 report		IGMP Report IGMPv1/v2 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
      vlan
      vlan
      igmp snooping
```

┌

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

--	--	--

	ip igmp snooping vlan mrouter learn pim-dvmrp	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
```

	ip igmp snooping source-check port	

-	-

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
    
```

ip igmp snooping mrouter learn pim-dvmrp	

┌

-	-

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**

┌

ip igmp profile	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
    
```

|

ip igmp snooping filter	

|

|

-	-

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
gda-table	
interfaces	igmp snooping filtering
mrouter	
statistics [vlan <i>vlan-id</i>]	snooping
vlan	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
event	IGMP Snooping
packet	IGMP Snooping
msf	IGMP Snooping
warning	IGMP Snooping

└──

└── EXEC

└──

└──

-	-

└──

-	-

└──

16 DHCPV6 Snooping

16.1

16.1.1 ipv6 dhcp snooping

```

dhcpv6 snooping
snooping

```

```

ipv6 dhcp snooping

```

```

no ipv6 dhcp snooping

```

no

dhcpv6

-	-

┌

┌

```

snooping

```

```

snooping

```

```

dhcpv6 snooping
dhcpv6 snooping

```

show ipv6 dhcp

```

1
Ruijie(config)#

```

```

1 dhcpv6 snooping
Ruijie(config)# ipv6 dhcp snooping

```

```

show ipv6 dhcp snooping

```

show ipv6 dhcp snooping	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**

|

show ipv6 dhcp snooping	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**

show ipv6 dhcp snooping	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)# ipv6 dhcp snooping link-detection	
	show ipv6 dhcp snooping	dhcpv6 snooping
	10.4	

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
    
```

show ipv6 dhcp snooping	dhcpv6 snooping

10.4	

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

port-security	MAC + IPV6 IPV6 IPV6
	MAC IPV6

┌

┌

┌

IPV6

DHCPV6

IPV6

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

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 <i>vlan_id</i>	VLAN
interface <i>interface_name</i>	

dhcpv6 snooping

```
1 show ipv6 dhcp snooping prefix
```

```
Total number of prefix: 1
```

Mac Address	IPv6 Prefix	Lease(s)	VLAN	Interface
00d0.f801.0101	2001:2002::/64	42368	2	fa 0/1

* [REDACTED]

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
vlan <i>vlan_id</i>	VLAN
interface <i>interface_name</i>	

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

┌

┌

┌

dhcpv6 snooping

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

┌

┌

┌

10.4	

16.3.3 clear ipv6 dhcp snooping statistics

dhcpv6 snooping dhcpv6

clear ipv6 dhcp snooping statistics

┌

-	-

┌

┌

┌

dhcpv6 snooping dhcpv6

	10.4	

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
    
```

show ipv6 nd snooping	ipv6 nd snooping

10.4(2)	

17.1.3 ipv6 nd snooping trust

trust	no
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

key-node-only	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
```

show ipv6 nd snooping	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
```

show ipv6 nd snooping	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
```

strict	link-local link-local link-local
ip-mac	IP+MAC IP

```
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**



show ipv6 nd snooping	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

	VLAN	IPv6
<i>num</i>		

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**

show ipv6 nd snooping	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
```


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
no	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**

show spanning-tree interface	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
```

show spanning-tree interface	STP

--	--

-	-
---	---

18.1.6 spanning-tree bpduguard

BPDU Guard enabled disabled
BPDU Guard

spanning-tree bpduguard [enabled | disabled]

enabled	BPDU Guard
disabled	BPDU Guard

```
Ruijie(config)# interface gigabitethernet 1/1  
Ruijie(config-if)# spanning-tree bpduguard enable
```

show spanning-tree interface	STP
-------------------------------------	-----

-	-
---	---

18.1.7 spanning-tree compatible enable

MSTI

spanning-tree compatible enable

no spanning-tree compatible enable

--	--

	-	-
--	---	---

|

|

|

|

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



	-	-

┌

	-	-

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
```

```
└───┘
```

show spanning-tree interface	STP

```
└───┘
```

```
└───┘
```

-	-

18.1.12 spanning-tree loopguard default

```
loop guard           no           loop guard           loop guard
                    bpd
```

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

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

MSTP

.

.

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

show spanning-tree	

.

--	--


```
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
```

	show spanning-tree interface	STP
	-	-

18.1.20 spanning-tree portfast

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

no spanning-tree portfast bpdudfilter default

-	-

┌

BPDU filter

┌

┌

BPDU Filter

BPDU

show spanning-tree

┌

Ruijie(config)# **spanning-tree portfast bpdudfilter 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
spanning-tree reset		
	-	-

... W ! !

|

|

|

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

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

3

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

--	--

show spanning-tree

tx-hold-count	TxHoldCount
pathcost method	

└──

└──

└──

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

spanningtree pathcost method	
spanning-tree forward-time	BridgeForwardDelay
spanning-tree hello-time	BridgeHelloTime
spanning-tree max-age	BridgeMaxAge

link-type	linktype
------------------	----------

┌

┌

┌

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

spanning-tree bpdupfilter	BPDU filter
spanning-tree portfast	portfast
spanning-tree bpduguard	BPDU guard
spanning-tree link-type	“ ”

┌

-	-
---	---

18.2.3 show spanning-tree mst

MST Instance

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

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

Instance

.

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

spanning-tree mst configuration	MST region
spanning-tree mst cost	instance
spanning-tree mst max-hops	instance
spanning-tree mst priority	instance
spanning-tree mst port-priority	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*]

interface-id [**both** | **rx** | **tx**] |
} | **mac** {**source** *mac-addr* |

interface-id
SVI

destination interface

interface-id

mac source *mac-addr*

interface-id

SVI

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
    
```

show monitor	

reflector-port

-	-

20.1.2 remote-span

RSPAN VLAN

[no] remote-span

-	-

VLAN

end Ctrl+C
 exit

Ruijie(config)#

	show vlan	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

```

show interface	

```

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

```

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

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

show interface	

-	-

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

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

```
ARP          1
```

```
ARP          ARP          ARP
```

```
ARP
```

```
ARP          30s
```

arp retry interval 30

Arp retry times number	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
ARP

IP

MAC
ARP
ARP

┌

120
interface fastEthernet 0/1
arp timeout 120

FastEthernet 0/1

ARP

┌

--	--

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

L

1000

ARP

arp trusted 1000

L

service trustedarp	ARP

L

L

-	-

500

arp unresolved 500

-	-

-	-

ip proxy-arp

no

-

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
IP 1

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]

vrf vrf_name	VRF		VRF	ARP
trusted	ARP	ARP		VRF
ip	IP		IP	ARP
	trusted			ARP
		ARP		
mask	IP	ARP	;	trusted
		ARP		
	ARP			
static		arp		
mac-address		mac	ARP	
complete			arp	
incomplete			arp	
oob			(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

	-	-

|

complete	arp
incomplete	arp

ARP

ARP

show arp detailRuijie# **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

-	-

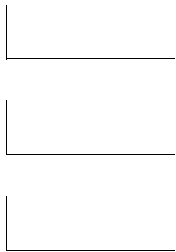
-	-

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)

	-	-



	-	-

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

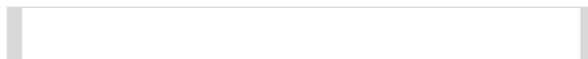
bytes	IP		68~1500

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
    
```



	-	-

┌

┌

┌
RGOS

ICMP

ICMP

┌
FastEthernet 0/1
interface fastEthernet 0/1
no ip redirects

ICMP

	-	-

┌

	-	-

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		MAC
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

hardware-address	DHCP
host	IP DHCP
ip dhcp pool	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

┌

host	IP DHCP
ip dhcp pool	DHCP DHCP

┌

┌

-	-

23.1.4 default-router

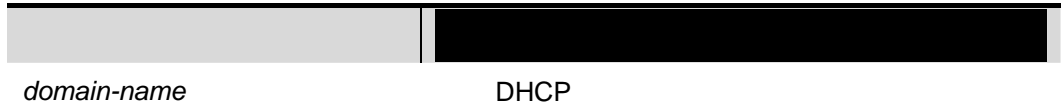
DHCP

DHCP

default-router

no

default-router



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

┌
└

ethernet

┌
└

DHCP

┌
└

DHCP

.

G'56tr2G!à

┌

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
    
```

┌

dns-server	DHCP DNS
ip dhcp pool	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          Ping
              10
    
```

```

              ping          3
ip dhcp ping packets 3
    
```

clear ip dhcp conflict	DHCP
ip dhcp ping timeout	DHCP ping ping
show ip dhcp conflict	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



host	IP DHCP
ip dhcp excluded-address	DHCP IP
network 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>	
infinite	

┌

DHCP

┌

DHCP

DHCP

┌

lease 0 1 DHCP 1



DHCP 1

lease 0 0 1



ip dhcp pool	DHCP DHCP
-	-

23.1.16 netbios-node-type

DHCP NetBIOS DHCP

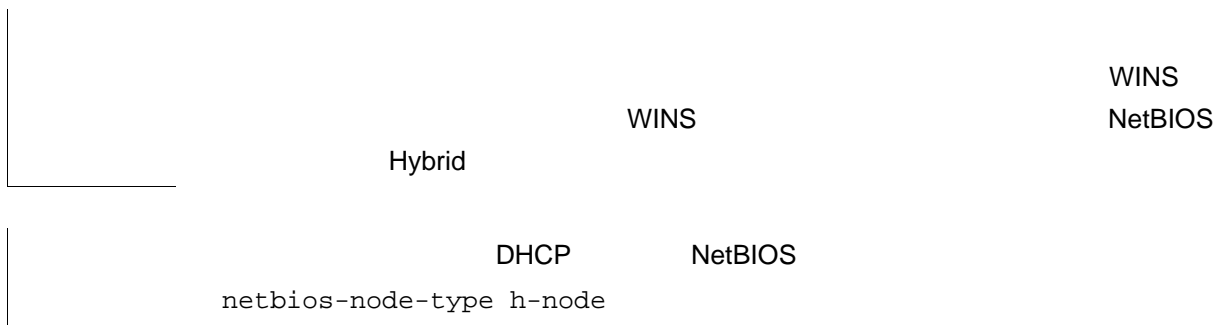
netbios-node-type **no** NetBIOS

netbios-node-type *type*

no netbios-node-type

	NetBIOS
	0~FF
<i>type</i>	<ul style="list-style-type: none"> > b-node > p-node > m-node > 8 h-node > b-node > p-node > m-node > h-node

	NetBIOS															
	DHCP															
	<table style="width: 100%; border: none;"> <tr> <td style="width: 33%;">DHCP</td> <td style="width: 33%;">NetBIOS</td> <td style="width: 33%;">1 Broadcast</td> </tr> <tr> <td>NetBIOS</td> <td>2 Peer-to-peer</td> <td>WINS</td> </tr> <tr> <td>NetBIOS</td> <td>3 Mixed</td> <td></td> </tr> <tr> <td>WINS</td> <td>4 Hybrid</td> <td>WINS</td> </tr> <tr> <td>NetBIOS</td> <td></td> <td>NetBIOS</td> </tr> </table>	DHCP	NetBIOS	1 Broadcast	NetBIOS	2 Peer-to-peer	WINS	NetBIOS	3 Mixed		WINS	4 Hybrid	WINS	NetBIOS		NetBIOS
DHCP	NetBIOS	1 Broadcast														
NetBIOS	2 Peer-to-peer	WINS														
NetBIOS	3 Mixed															
WINS	4 Hybrid	WINS														
NetBIOS		NetBIOS														



```

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

```

ip dhcp excluded-address	DHCP IP
ip dhcp pool	DHCP DHCP

-	-
---	---

23.1.18 next-server

```

DHCP
next-server no
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
    
```

bootfile	DHCP
ip dhcp pool	DHCP DHCP
ip help-address	Helper
option	RGOS DHCP

```

DHCP option                                RFC 2131
1 19 IP 0 IP 1 IP DHCP 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
```

ip dhcp pool	DHCP DHCP



DHCP

DHCP

DHCP

service dhcp

show ip dhcp server statistics	DHCP

-	-

23.2

23.2.1 clear ip dhcp binding

DHCP

clear ip dhcp binding clear ip dhc(bidn)6ding

show ip dhcp binding	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	ping
ARP	clear ip dhcp conflict

clear ip dhcp conflict *

ip dhcp ping packets	DHCP ping
show ip dhcp conflict	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

|

-	-

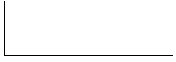
|

|

-	-

23.2.5 debug ip dhcp server

DHCP Server



	-	-
--	---	---

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

clear ip dhcp binding	DHCP

--

	-	-

23.2.8 show ip dhcp conflict

DHCP EXEC show ip dhcp conflict

show ip dhcp conflict

	-	-

|

|

|

DHCP

show ip dhcp conflict

```
Ruijie# show ip dhcp conflict
IP address      Detection Method
192.168.12.1    Ping
dhcpd excluded ipaddress
192.168.12.100
```

--	--

23.2.9 show ip dhcp server statistics

DHCP

EXEC

show ip dhcp server statistics

show ip dhcp server statistics

	-	-

|

|

|

DHCP

show

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

clear ip dhcp server statistics	DHCP

--

-	-

24 DHCP Relay

24.1

24.1.1 ip dhcp relay check server-id

```
DHCP Relay    check server-id          no
DHCP Relay    check server-id
```

```
[no] ip dhcp relay check server-id
```

	-	-

```
|
```

```
|
```

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

service dhcp	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
    
```

	ip helper-address [vrf] A.B.C.D	DHCP

	-	-

25 DNS

25.1

25.1.1 ip domain-lookup

	DNS	no	DNS
	ip domain-lookup		
	no ip domain-lookup		
	-		-
	DNS		
	DNS		DNS
	DNS		
	Ruijie(config)# ip domain-lookup		
	show hosts		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

show hosts	DNS

└──

-	-

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

┌

┌

┌

no ip host host-name ip-address

┌

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

┌

show hosts	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
----------------	---------	---------------

ip host	IP
ipv6 host	IPV6
ip name-server	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

|

show sntp	SNTP
sntp enable	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

sntp enable	SNTP
show sntp	SNTP

RGOS10.0

-	-

27 NTP

27.1 NTP

27.1.1 no ntp

	ntp	ntp
no ntp		
	-	-
	NTP	
	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

peer	NTP
serve	NTP
serve-only	NTP
query-only	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**

ip access-list	IP

	-	-

27.1.3 ntp authenticate

NTP NTP

ntp authenticate

no ntp authenticate

	-	-

NTP

ntp authentication-key ntp trusted-key nt

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

stratum	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

┌

no ntp	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

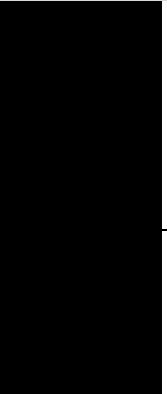
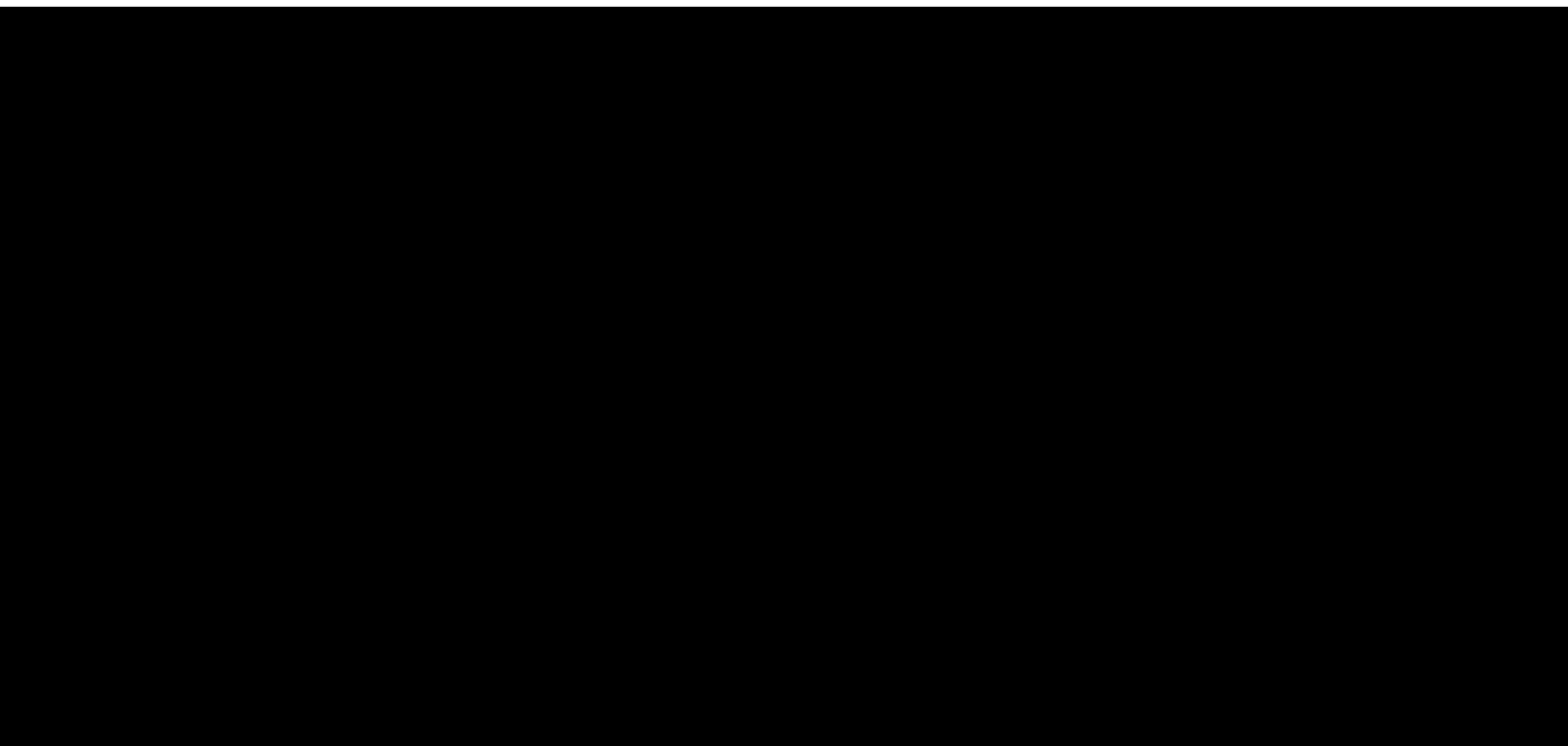
ntp trusted-key *key-id*

no ntp trusted-key *key-id*

┌

<i>key-id</i>	ID

┌



NTP

	-	-

|

|

|

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 the IP address of the destination host. The IP address must be in the format of a.b.c.d, where a, b, c, and d are numbers from 0 to 255. The IP address must be a valid IPv4 address. The IP address must be in the format of a.b.c.d, where a, b, c, and d are numbers from 0 to 255. The IP address must be a valid IPv4 address.

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

udp-helper enable	UDP
ip forward-protocol	UDP

	RGOS10.1	
	-	-

29.1.3 udp-helper enable

udp-helper enable	UDP	no udp-helper enable
UDP		
UDP		
udp-helper enable		
no udp-helper enable		

	-	-

	UDP
--	-----

--	--

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

	UDP
	Ruijie(config)# udp-helper enable

	ip forward-protocol	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

ëCÄS¼ p lq U cWÛÂ ðÂ @ÒÂ€



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)# snmp-server group mib2user v3 priv read mib2	
show snmp group	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
version	snmp V1 V2C V3
auth noauth priv	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
    
```

snmp-server enable traps	

-	-

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



	snmp-server queue-length	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**

┌

snmp-server enable traps	
snmp-server enable host	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**

snmp-server queue-length	
snmp-server enable host	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>			
v1 v2 v3	SNMP	v3	
encrypted	16	SHA	MD5 16
auth			20

SHA

|

default

MIB

|

|

|

MIB-2 oid 1.3.6.1

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

|

show snmp view	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
    
```

snmp-server chassis-id	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
    
```

rmon event <i>number</i> [log] [trap community] <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
    
```

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

DHCPv6 client

	-	-

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

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

33.2

33.2.1 show ipv6 dhcp relay destination

DHCPv6 Relay Agent

show ipv6 dhcp relay destination	
all	
interface <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
    
```

clear ipv6 dhcp relay statistics	

-

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**

show ipv6 dhcp relay statistics	

-

	10.4	

no

[no] tp-guard port enable



|

|

tpp

|

Ruijie# **show tpp**

|

topology guard	

|

|

-	-

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*

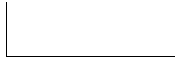
	vrf <i>vrf-name</i>	VRF

RIP

address-family
(config-router-af)#

VRF

	exit-address-family	
	ip vrf	VRF



	-	-

35.1.2 auto-summary (RIP)

RIP

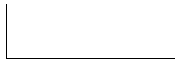
auto-summary

no

auto-summary

no auto-summary

	-	-



RIP
RIPv1 RIPv2
RIP

>

RIP

RIP

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

version	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

```



RIP

	redistribute	
		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*]

	always	

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
```

-	-

-

distribute-list in

name] | **prefix** *prefix-list-name* [**gateway**
face-number]

r | *name*] | **prefix** *prefix-list-name* [**gateway**
face-number]

--

```

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

```

access-list	
prefix-list	

-	-

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**]]

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

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
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

text	RIP
md5	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
    
```

ip rip authentication key-chain	RIP	RIP	RIP
		RIPv2	
ip rip authentication text-password	RIP	RIP	RIP
		RIPv2	
key chain			

┌

-	-
---	---

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
    
```

ip rip authentication mode	RIP
ip rip authentication key-chain	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

┌

-	-

┌

RIP

┌

┌

RIP

default no RIP

Fastethernet 0/0 RIP

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

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



	version	RIP
	-	-

35.1.17 ip rip send enable

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

35.1.19 ip rip send version

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

1	RIPv1
2	RIPv2

version

	vesion	
	RIPv1 RIPv2	RIP

Fastethernet 0/0 RIPv1 RIPv2

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


version	RIP

-	-

35.1.20 ip rip split-horizon (RIP)

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

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

```

neighbor RIP	RIP IP
Validate-update-source	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
    
```

auto-summary	RIP

--	--



```

network-number wildcard
RIP
wildcard RGOS
RIP
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

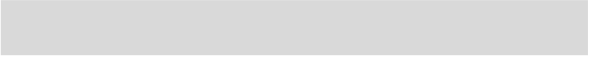
```

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
```



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

	OSPF		
	ISIS	level-2	
	metric	1	
	route-map		

RIP

RIP

\$20 _,X6

35.1.29 router rip

no RIP router rip
no router rip

	-	-

RIP

RIP

	<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

-	-

┌

┌

RIP

IP

RIP

RIP

validate-update-source

ip unnumbered RIP

validate-update-source

┌
┌

Ruijie(config)# **router rip**

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

ip rip split-horizon	RIP
ip unnumbered	IP
neighbor (RIP)	RIP IP

35.1.32 version (RIP)

RIP

version

no

version {1 | 2}

no 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

show ip rip	

-	-

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]

```

bgp connected isis ospf static	

vrf <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
```

show ip rip	

-	-

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

ip ospf authentication-key	OSPF
ip ospf message-digest-key	OSPF MD5
area virtual-link	

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

area stub	OSPF	
area nssa	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
' access prefix	prefix list ACL
' in out	

```
ABR
ABR
```

	-	-

L

	-	-

LSA	ASBR	(ABR)			Type-7
LSA						
no-redistribution	ASBR		OSPF	redistribute		
NSSA			NSSA	ASBR	ABR	
			NSSA			
	NSSA			LSA		ABR
no-summary		ABR	NSSA	summary LSAs	Type-3 LSA	
area default-cost			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          area stub  ABR
(LSA) 1      1      LSA 2  2      LSA 3  3
LSA          OSPF
ABR          OSPF
              ABR    area stub  no-summary
              ABR
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

message-digest	MD5
null	

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** **172.16.0.0** **255.255.0.0** **TC2_(ro/C253.j/T10-router/**

OSPF

┌

┌

-	-

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
      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)# router ospf 1	
	Ruijie(config-router)# no compatible rfc1583	
	show ip ospf	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*]

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

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

|

|

-	-

36.1.14 default-metric

```

    OSPF
no
default-metric metric
no default-metric
    
```

|

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

|

20

|

|

```

default-metric redistribute
default-metric default-information originate OSPF
    
```

|

```

    OSPF
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
    
```

|

--	--

redistribute	
show ip ospf	ospf

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36.1.15 discard-route

discard no discard

discard-route {internal|external}

no discard-route {internal|external}

internal	discard area range
external	summary-address discard

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┌

└

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└

discard

ABR ASBR discard

area range discard

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

Ruijie(config-router)# **no discard-route internal**

area range	OSPF
summary-address	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
intra-area distance	1-255
inter-area distance	1-255
external distance	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
prefix prefix-list-name	prefix-list
bgp connected isis [<i>area-tag</i>] ospf <i>process-id</i> rip static	

distribute-list out redistribute route-map

OSPF

redistribute

ACL prefix-list

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
```

distribute-list in	LSA
redistribute	

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]]

error	error traps error traps ifauthfailure ifconfigerror ifrxbadpacket virtifauthfailure virtifconfigerror virtifrxbadpacket
lsa	lsa traps lsa traps lsdbapproachoverflow LSA lsdboverflow LSA maxagelsa LSA originatelsa LSA
retransmit	retransmit traps retransmit traps iftxretransmit virtiftxretransmit

OSPF (graceful restart GR) graceful-restart
 graceful-restart grace-period grace period
 no

graceful-restart [grace-period *grace-period*]

no graceful-restart [grace-period]

grace-period	grace-period
<i>grace-period</i>	GR OSPF 1-1800

GR Restart
 Grace-period 120s

OSPF OSPF OSPF OSPF GR
 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**

graceful-restart helper	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}}

disable	
strict-lsa-checking	GR Helper types 1-5,7 LSA GR Helper
internal-lsa-checking	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

graceful-restart	OSPF
-	-

36.1.23 ip ospf authentication

no

ip ospf authentication [message-digest | null]

no ip ospf authentication

message-digest	MD5
null	

Ruijie(config)#
 Ruijie(config)#

Ruijie(config)# **no ip ospf authentication**
 Ruijie(config)#

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**

area authentication	OSPF
ip ospf authentication-key	OSPF
ip ospf message-digest-key	OSPF MD5

┌

┌

-	-

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
    
```

┌

area authentication	OSPF
ip ospf authentication	

┌

┌

-	-

36.1.25 ip ospf bfd

```

      OSPF          BFD          ip
ospf bfd [disable] no          ip ospf bfd
ip ospf bfd [disable]
no ip ospf bfd
    
```

┌

disable	OSPF BFD

┌

OSPF BFD

┌

bfd all-interfaces

"

OSPF

	-	-
--	---	---

36.1.26 ip ospf cost

OSPF	OSPF	ip ospf cost
no		
ip ospf cost cost		
no ip ospf cost		
cost	OSPF	

/Bandwidth	100Mbps
------------	---------

OSPF	100Mbps/Bandwidth	Bandwidth
bandwidth		
OSPF		
> 64K	cost 1562	
> E1	cost 48	
> 10M	cost 10	
> 100M	cost 1	
ip ospf cost	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

OSPF

-	-
---	---

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 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
  
```

ip ospf dead-interval	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**

area authentication	OSPF
ip ospf authentication	

-	-

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
    
```

dialer map ip	IP	
frame-relay map	IP	DLCI
neighbor OSPF	IP	NBMA
X25 map	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

	LSU	1-65535
<i>seconds</i>		

┌
└

┌
└

5

LSU LSU **ip ospf**
retransmit-interval LSU
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
OSPF
OSPF network IP
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

	hard soft	hard LSA soft LSA	OSPF
	OSPF	LSA	
	soft	OSPF hard	OSPF
	LSA 10	OSPF 10	
	<pre>Ruijie# config terminal Ruijie(config)# router ospf 10 Ruijie(config-router)# overflow database 10 hard</pre>		
	-	-	
	-	-	

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
    
```

-	-

-	-

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
  
```

clear ip ospf process	OSPF
show ip protocols ospf	OSPF

--	--

type number	
default	

OSPF

```

serial 1/0
Ruijie(config)# router ospf 30
Ruijie(config-router)# passive-interface serial1/0
    
```

show ip ospf interface	

-	-

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

isis <i>[area-tag]</i>	isis	<i>area-tag</i>	isis
ospf <i>process-id</i>	ospf	<i>process-id</i> 1-65535	ospf
rip	rip		
static			
level-1 level-1-2 level-2	level IS-IS	IS-IS	level-2
match		OSPF	OSPF
metric <i>metric-value</i>	OSPF external 2 LSA metric-value	metric	0-16777214
metric-type {1 2}		E-1 E-2	
route-map <i>route-map-name</i>			
subnets			
tag <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
    
```

summary-address	OSPF
default-metric	OSPF

-	-

36.1.46 router ospf

```

                                OSPF
                                no
                                OSPF
                                router 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
OSPF
RGOS10.1 OSPF OSPF
vrf vpn_1 OSPF 10
Ruijie(config)# router ospf 10 vrf vpn_1
    
```

show ip protocols	
show ip ospf	ospf

-	-

36.1.47 router-id

```

ID, no Router ID
Router ID
router-id router-id
no router-id
    
```

<i>router-id</i>	ID, IP

```

OSPF loopback IP
IP loopback OSPF
    
```

OSPF

router-id

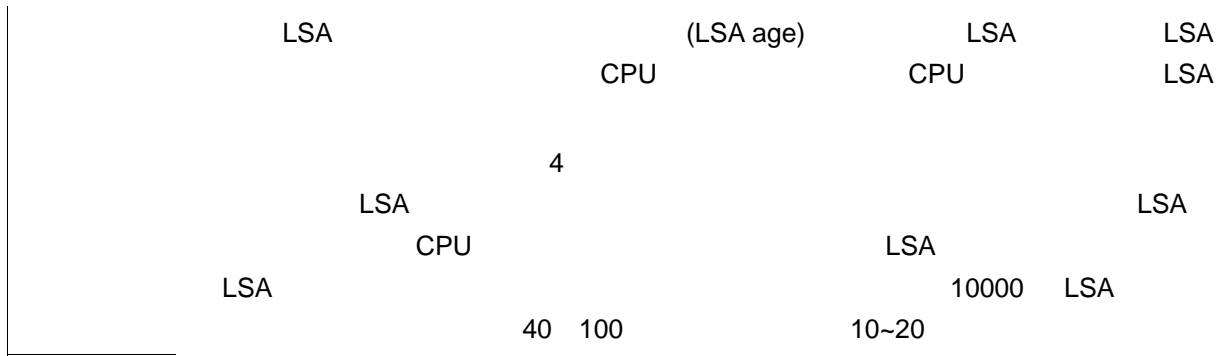
LSA

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
  
```

show ip ospf	ospf
timers throttle spf	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-holdtime SPF
spf-delay *spf-holdtime* *spf-max-waittime*
 SPF SPF **8**

OSPF

show ip ospf	ospf	
timers spf	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	®

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

-	-

-	-

36.2.2 show ip ospf border-routers

```

ABR/ASBR    OSPF                          show ip ospf
border-routers

show ip ospf [process-id] border-routers

```

<i>process-id</i>	ospf

```

show ip route          ABR  ASBR      OSPF      OSPF
                      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>	
adv-router	
<i>link-state-id</i>	OSPF
self-originate	
max-age	LSA
router	OSPF
network	OSPF
summary	OSPF
asbr-summary	ASBR
external	OSPF
nssa-external	OSPF
opaque-area	LSA
opaque-as	LSA
opaque-link	LSA
database-summary	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
```

Network Mask	
Metric Type	
TOS	TOS 0
Metric	
Forward Address	0.0.0.0 IP
External Route Tag	OSPF 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)
LS age: 572
Options: 0x2 (*|---|E|)
LS Type: network-LSA
Link State ID: 192.88.88.27 (address of Designated Router)
Advertising Router: 1.1.1.1
LS Seq Number: 80000001
Checksum: 0x5366
Length: 32
Network Mask: /24
Attached Router: 1.1.1.1
Attached Router: 3.3.3.3
```

show ip ospf database network

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
```



OSPF

BDR	BDR	BDR	(Hello
	BDR)		
Options	Hello E	0	STUB
		STUB	

OSPF

count	OSPF
--------------	-------------

--

--

--

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

OSPF

	-	-
--	---	---

	-	-

37

37.1

37.1.1 distribute-list in

no **distribute-list in**

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*]



```

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

```

access-list	
prefix-list	

-	-

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*]

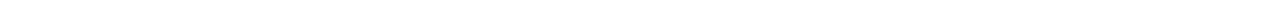
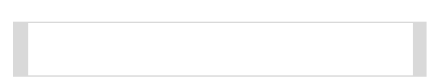
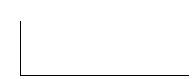
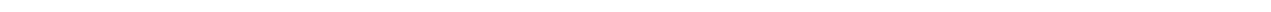
<i>access-list-number</i>	1-99 1300-1999 100-199 2000-2699
<i>access-list-name</i>	
prefix <i>prefix-list-name</i>	
<i>Interface</i>	()
<i>protocol</i>	()

<i>community-list-name</i>	80
<i>community-list-number</i>	1-99 100-199
permit	
deny	
<i>community-number</i>	AA:NN(2) 0-4294967295 internet Internet local-as AS no-advertise BGP peers no-export EBGp peers 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
```

match community	
set comm-list delete	BGP
show ip community-list	
show ip bgp community-list	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
deny	
permit	
<i>ip-prefix</i>	IP 0 32
<i>minimum-prefix-length</i>	() ge
<i>maximum-prefix-length</i>	() le

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>	

	-	-

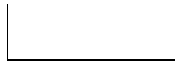
37.1.8 ip ref ecmp load-balance

S5760

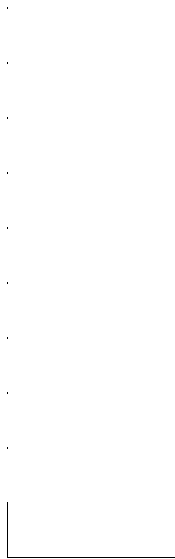
ip ref ecmp load-balance { src-dst-mac | ip }

no ip ref ecmp load-balance { src-dst-mac | ip }

--	--



37.1.9 ip route





```
0.0.0.0 FastEthernet 0/0
FastEthernet 0/0
ip route 0.0.0.0
ARP
CPU
```

```
172.16.100.0/24
192.168.12.1 115
ip route 172.16.100.0 255.255.255.0 192.168.12.1 115
```

```
172.16.100.0/24
fastEthernet 0/0
Ruijie(config)# ip route 172.16.100.0 255.255.255.0 fastEthernet
0/0 192.168.12.1
```

show ip route	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

ipv6 route	ipv6
show ipv6 route	IPv6

!

37.1.19 match community

match origin	
set as-path prepend	AS_PATH
set comm-list delete	
set community	
set metric	

┌

-	-

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

```

match ip address	
match ip next-hop	
match ip route-source	
match metric	
match route-type	
match tag	
set metric	
set metric-type	
set tag	

-	-

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>	
prefix-list <i>prefix-list-name</i>	

|
 |
 |

match ip address

RIP

RIP

OSPF

match ip next-hop	
match ip route-source	
match metric	
match route-type	
match tag	
set metric	
set metric-type	
set tag	

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**

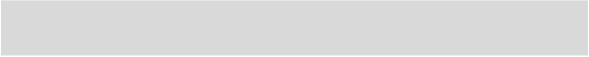
Ruijie(config-router)# **exit**

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>	
prefix-list <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

```

access-list	
match ip address	
match interface	
match ip next-hop	

match route-t}T1 1 Tf

match ipv6 route-source	IPv6
match metric	
match route-type	
match tag	
set metric	
set metric-type	
set tag	
set ipv6 default next-hop	
set ipv6 next-hop	
show ipv6 policy	

-	-

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>	
prefix-list <i>prefix-list-name</i>	IPv6

OSPF

RIP

RIP

IP

OSPF

route maps

	1	match	1	set
match		set		

```

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>	
prefix-list <i>prefix-list-name</i>	IPv6

|

|

|

```

                                OSPF
                                RIP        RIP
                                IP
                                route maps
                                1          match 1          set
                                match    set

```

match ipv6 address	IPv6
match ipv6 route-source	IPv6
match metric	
match route-type	
match tag	
set metric	
set metric-type	
set tag	

-	-

37.1.27 match length

no IP match length

<i>metric</i>	0-4294967295
---------------	--------------

└──

└──

└──

```

                                OSPF
                                RIP
                                RIP
                                IP
                                OSPF
                                route maps
                                OSPF
                                match
                                1
                                match
                                set
                                1
                                set
                                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}

egp	EGP
igp	IGP
Incomplete	

┌

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┌

```
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
```

match as-path	AS_PATH
match metric	
match origin	

set as-path prepend	AS_PATH
set metric	
set origin	
-	-

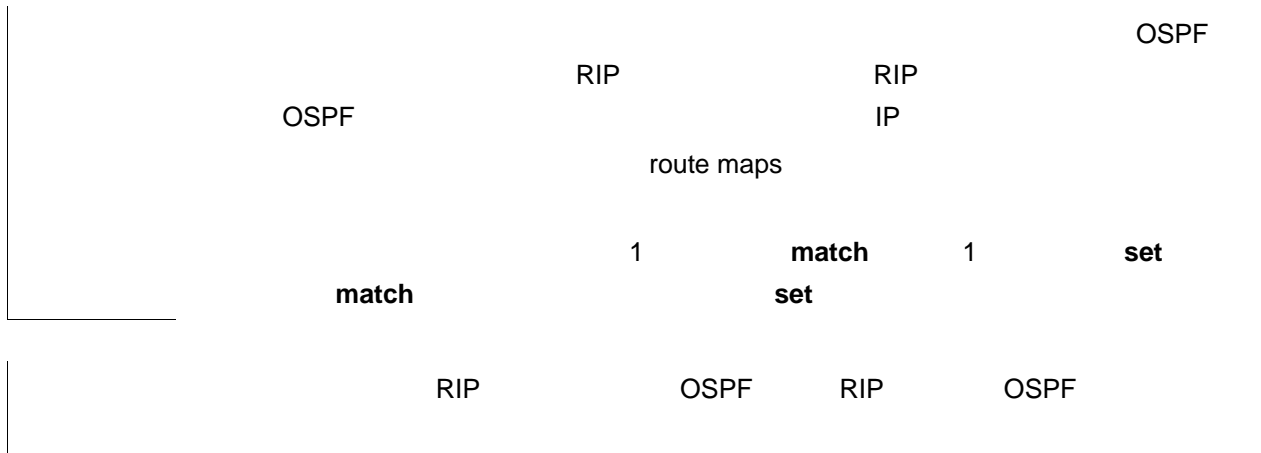
37.1.30 match route-type

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}

local	
Internal	OSPF
external	(BGP OSPF)
type-1 type-2	OSPF 1 2
level-1 level-2	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

```

access-list	
match ip address	
match interface	
match ip next-hop	
match ip route-source	
match metric	
match tag	
set metric	
set metric-type	
set tag	

-	-

37.1.31 match tag

match tag **no**

match tag *tag* [...*tag*]

no match tag *tag* [...*tag*]

<i>tag</i>	

```

match tag          tag
                    RIP          RIP
                    OSPF        OSPF
                    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

```

access-list	
match ip address	
match interface	
match ip route-source	
match metric	
match ip next-hop	
match route-type	
set metric	
set metric-type	
set tag	

-	-

37.1.32 maximum-paths

maximum-paths

no

maximum-paths *number*

no maximum-paths

<i>route-map-name</i>	
permit	permit match set set permit match set
deny	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

```

Redistribute	

-	-

37.1.34 set aggregator as

	match	AS	set
aggregator as	no		
set aggregator as	<i>as-num ip_addr</i>		

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

```

ip community-list	
match as-path	AS_PATH
match community	
match metric	
match origin	
set as-path prepend	AS_PATH
set comm-list delete	
set local-preference	

37.1.37 set community

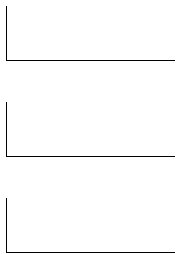
match COMMUNITY set

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
additive	community
none	



```
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
```

6 Tda0.02 0 0 10.02 78.36 203580618 Tim0(())Tj-18 034F5T4>1 TfC.f0000000000202 Dd(Tj)TJTBT361614683

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

```

match as-path	AS_PATH
match community	
match metric	
match origin	
set as-path prepend	AS_PATH
set metric	
set metric-type	

-	-

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



route-map	
------------------	--

match ip address	
-------------------------	--

set default interface	
------------------------------	--

set	WCMP	weight	WCMP	WCMP
set ip next-hop	IP	32		
ip address	weight	4	nexthop	
	next-hop	weight	set	
r	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 Z R

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

```

route-map	
match ip address	
set default interface	

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	

	set metric-type	
	set tag	
	set ip precedence	IP

37.1.45 set ipv6 next-hop verify-availability

Route-map **set ipv6 next-hop verify-availability** BFD
 IPv6 **no**

set ipv6 next-hop verify-availability *[global-ipv6-address [weight] bfd interface-type interface-number gateway]*

no set ipv6 next-hop verify-availability *[global-ipv6-address [weight] bfd interface-type interface-number gateway]*

--	--	--

```

#                               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

```

bfd	BFD

10.4	

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

```

match interface	
match ip address	
match ip next-hop	
match ip route-source	
match metric	
match route-type	
match tag	
set metric-type	

match interface	
match ip address	
match ip next-hop	
match ip route-source	
match metric	
match route-type	
match tag	
set metric	
set tag	

-	-

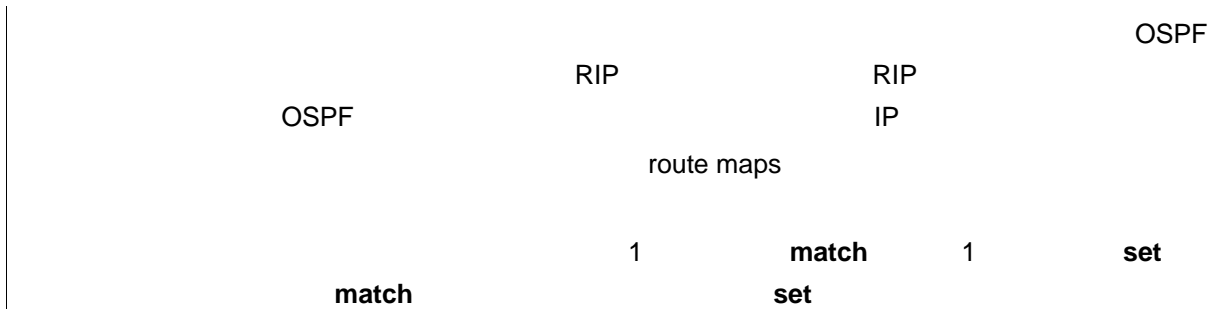
37.1.50 set next-hop

match IP set next-hop
no

set next-hop ip-address

no set next-hop ip-address

ip-address	IP



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

```

match as-path	AS_PATH
match metric	
match origin	
set as-path prepend	AS_PATH
set metric	
set local-preference	

--	--

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```

                                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
```

match interface	
match ip address	
match ip next-hop	
match ip route-source	
match metric	
match route-type	
match tag	
set metric	
set metric-type	

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-	-

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
```

match as-path	AS_PATH
match community	
match metric	
match origin	
set community	COMMUNITY
set metric	
set metric-type	

-	-

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	show ipv6 prefix-list
show ipv6 prefix-list [<i>prefix-name</i>]	
<i>prefix-name</i>	IPv6

show ipv6 route *[[network/prefix-length | summary | protocol]]*

<i>network/prefix-length</i>	
summary	ipv6
protocol	connected, static ospf, rip bgp, isis,

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

<i>max_num</i>	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

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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
```

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	-	-

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>	

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└──┘

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**

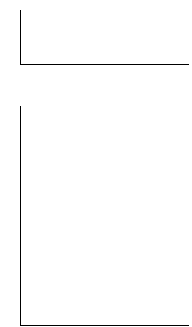
```
Ruijie(config-route-map)#exit
```

```
Ruijie(config)#ip local policy route-map lab1
```

access-list	
route-map	
set vrf	IP VRF
set ip next-hop	
set ip default next-hop	
set interface	
set default interface	
set ip tos	IP TOS
set ip dscp	IP DSCP
set ip precedence	IP
match ip address	
match length	

-	-

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	

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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

```

access-list		
route-map		
set vrf	IP	VRF
set ip next-hop		
set ip default next-hop		
set interface		
set default interface		
set ip tos	IP	TOS
set ip dscp	IP	DSCP
set ip precedence	IP	
match ip address		
match length		

-	-

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>	route-map
no	

└───┘

└───┘

> IPv6 ping
IPv6
> 1

set ipv6 precedence	IPv6
show ipv6 policy	
show route-map	
10.4	

38.1.5 ipv6 policy

```

set next-hop
ipv6 policy .
ipv6 policy {load-balance | redundance}
no ipv6 policy ipv6 policy

```

set default interface	
set interface	
set ipv6 default next-hop	
set ipv6 next-hop	
show ipv6 policy	

-

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>	route-map

>	
>	1
<hr/>	
r	

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
```

|

ip policy route-map	
ip local policy route-map	

|

|

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	

show route-map	

10.4	

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>

┌

┌

			ip
igmp access-group			
	IGMPv3		ACL
	MLD report	S1,S2,S3...Sn,G	(0,G)
r	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
    
```

	-	-

16)1QAAtB5iA

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**

ip igmp immediate-leave	-

-	-

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
```

-	-

~

!



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>	

┌

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ip igmp ssm-map enable v3

ACL 11 192.168.2.2
 Ruijie(config)# **ip igmp ssm-map static 11 192.168.2.2.**

-	-

┌

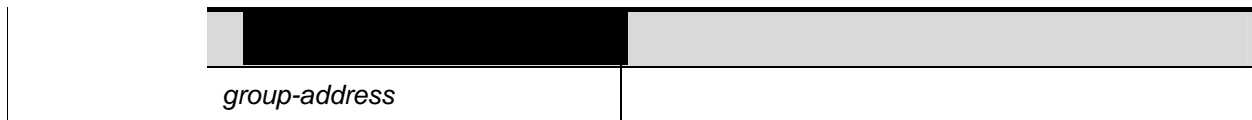
-	-

39.1.16 ip igmp static-group

no

ip igmp static-group *group-address*

no ip igmp static-group *group-address*



Eth0 236.6.6.6

┌

┌

igmp

igmp

┌

2

```
Ruijie# configure terminal
Ruijie(config)# interface ethernet 0
Ruijie(config-if)# ip igmp version 2
```

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-	-

┌

┌

-	-

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**

show ip igmp groups	-
show ip igmp interface	-

-	-

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	PIM-DM	PIM-DM
--	--------	--------	--------

PIM-DM

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 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# configure terminal	
	Ruijie(config)# interface fastethernet 0/1	
	Ruijie(config-if)# ip pim propagation-delay 600	

40.1.6 ip pim state-refresh disable

	PIM-DM	ip pim state-refresh disable
	no PIM-DM	
	ip pim state-refresh disable	
	no ip pim state-refresh disable	

	ip pim state-refresh disable	
	r	PIM-DM

```

PIM-DM
Ruijie# configure terminal
Ruijie(config)# ip pim state-refresh disable
    
```

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┌

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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>

┌

┌

┌

```

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

①DDVA dRsd DBAn02D 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

show ip pim dense-mode neighbor	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

	show ip pim dense-mode track	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
```

_____). .(

*	pimsm
<i>group_address</i>	pimsm

```
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
```

show ip pim sparse-mode track	-

-	-

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	BSR	BSR	prefix-count
	C-RP-ADV	C-RP			
	Ruijie# configure terminal				
	Ruijie(config)# ip pim accept-crp-with-null-group				
	-		-		
	-		-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)# ip pim accept-register list 100		

```
Ruijie (config)# access-list 100 permit ip 192.168.195.0 0.0.0.255
225.1.1.1 0.0.0.255
```

access-list	-

-	-

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
--	----	---

--	--	--

~~191.1B5B46D21CDD8C1528A658E-32.497FE>6<02D6Td(4<02DR)Tj/C2_0 1 Tf467a1D506 Td[DR~~

L

L

-	-

L

L

L

PIM
PIM-SM peering

L

```
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
```

L

access-list	-

L

L

-	-

41.1.17 ip pim neighbor-tracking

ip pim neighbor-tracking

L

-	-

L

L

join

```
join
```

```
Ruijie# configure terminal
Ruijie(config)# interface g 0/3
Ruijie(config-if)# ip pim neighbor-tracking
```

ip pim propagation-delay	-

-	-

41.1.18 ip pim override-interval

ip pim override-interval *interval-milliseconds*

	ip pim propagation-delay-	-
	-	-

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
    
```

	ip pim override-interval	-
	ip pim neighbor-tracking	-



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
    
```

access-list	-

-	-

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

~~IGMP~~

```

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
    
```

access-list	-

-	-

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):
```

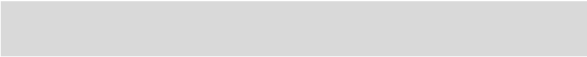
```
Address 30.30.100.200, DR 30.30.100.200
```

```
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]

detail	

/ /

```

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

RPF

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-Rj%L.àPj

```
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

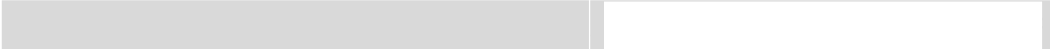
-	-

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>	
dense	PIMDM
sparse	PIMSM
summary	

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

-	-

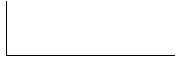
└──

└──

└──

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

└───┘

└───┘

└───┘

└───┘

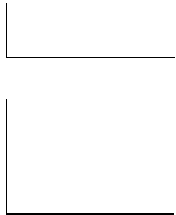
Ruijie# ping ipv6 fec0::1

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
eui-64	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

```

ipv6 address autoconfig	
ipv6 general-prefix	
show ipv6 general-prefix	

RGOS10.4	IPv6 RGOS10.4

43.1.3 ipv6 address autoconfig

```

no
ipv6 address autoconfig [default]
no ipv6 address autoconfig
IPv6
ipv6 address autoconfig

```

default	default

┌
└

```

RA
RA
EUI-64
RA
DNS
IPv6
DHCPv6
NTP
IPv6
no ipv6 address autoconfig
IPv6
    
```

```

Ruijie(config-if)# ipv6 address autoconfig default
Ruijie(config-if)# no ipv6 address autoconfig
    
```

ipv6 address <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	ipv6 enable
	IPv6	
r	IPv6	IPv6
	no ipv6 enable	IPV6

Ruijie(config-if)# **ipv6 enable**

show ipv6 interface	
----------------------------	--

-	-
---	---

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
    
```

show ipv6 interface	

-	-

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
```

show ipv6 interface	ra-info
ipv6 nd other-config-flag	

┌

-	-

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**

show ipv6 interface		

-		-

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>	
at valid-date preferred-date	
infinite	
default	
no-advertise	
off-link	IPV6 (on-link) on-link
no-autoconfig	

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
    
```

show ipv6 interface	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
    
```

--	--

show ipv6 interface	ra-info
ipv6 nd ra-interval	
ipv6 nd ra-hoplimit	
ipv6 nd ra-mtu	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
```


ipv6 nd ra-lifetime	
ipv6 nd ra-interval	
ipv6 nd ra-mtu	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**

┌

show ipv6 interface	

┌

┌

-	-

43.1.16 ipv6 nd suppress-ra

	(RA)	(RA)	no
ipv6 nd suppress-ra			
no ipv6 nd suppress-ra			

<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
```

```
show ipv6 interface
```

-	-

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**

ip	IPv4
ipv6	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	ipv6ip ipv6
		IPv4	IPv4

	-	-
--	---	---

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      [ ]

```

ANYCAST	(DAD)
TENTATIVE	(DAD)

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>INCOMP(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	
State	STATE ACTIVE— INACTIVE— mac
	IPV6

ipv6 neighbor	

┌

-	-

43.2.5 show ipv6 route

IPV6

show/C2_02>30<0.5 0 0 10.5 104.34 380.6003 Tm<1C50.02 0 0 10.02 135.36 573D3DE>71297.<1C50 1

```

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
    
```

area stub	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>	
advertise	
not-advertise	

┌

┌

	-

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
no-summary	stub ABR ABR 3 3 stub LSA LSA LSA

┌

┌

stub

area stub
stub
stub
AS
 (type 5 LSAs)
 stub
 OSPFv3
 stub ABR 3 LSA

	area default-cost	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)
hello-interval <i>seconds</i>	1-65535	hello
dead-interval <i>seconds</i>	1-65535	
retransmit-interval <i>seconds</i>	1-65535	LSA
transmit-delay <i>seconds</i>	1-65535	LSA
instance <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
    
```

show ipv6 ospf	OSPFv3
show ipv6 ospf neighbor	OSPFv3
show ipv6 ospf virtual-links	OSPFv3

-	-

44.1.5 auto-cost

OSPFv3

no

onoost

reference-bandwidth <i>ref-bw</i>	Mbps 1-4294967

┌

┌

```

OSPFv3      Hello      OSPFv3      BFD
  FULL      BFD        BFD          BFD
  OSPFv3
      ipv6 ospf bfd [disable]      BFD
      bfd all-interfaces
    
```

┌

┌

ipv6 router ospf <i>process-id</i>	OSPFv3 OSPFv3
ipv6 ospf bfd [disable]	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]
    
```

always	OSPFv3
metric -D	

```

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
```

redistribute	
show ipv6 ospf	OSPFv3
show ipv6 ospf database	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

```

redistribute	
show ipv6 ospf	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
intra-area distance	1-255
inter-area distance	1-255
external distance	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
    
```

ipv6 router ospf	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
area area-id	OSPFv3 IPv4

OSPFv3

instance <i>instance-id</i>	OSPFv3 0-255
------------------------------------	-----------------

OSPFv3	OSPFv3	OSPFv3	ipv6 router ospf
no ipv6 ospf area		OSPFv3	
no ipv6 router ospf		OSPFv3	
<i>instance-id</i>			
		OSPFv3	

	int fastethernet 0/0	OSPFv3
int fastethernet 0/0		
ipv6 ospf 1 area 2 instance 2		



disable	OSPF	BFD
instance <i>instance-id</i>	OSPFv3 0-255	

OSPFv3	BFD
--------	-----

		bfd all-interfaces	
	ipv6 ospf bfd		BFD
OSPFv3		bfd all-interfaces	OSPFv3
BFD		ipv6 ospf bfd disable	
BFD			

ipv6 router ospf <i>process-id</i>	OSPFv3 OSPFv3
bfd all-interfaces	OSPFv3 BFD

-	-

44.1.13 ipv6 ospf cost

no

ipv6 ospf cost *cost* [**instance** *instance-id*]

no ipv6 ospf cost [**instance** *instance-id*]

--	--

cost

3#Å

Y@B @Ñ-p8...C

1 we=oaDX\$Dif&N#2Sd' "ãhD"ND5eA2 !-RBb dRsd!r"


GÄ@ CÄE7B

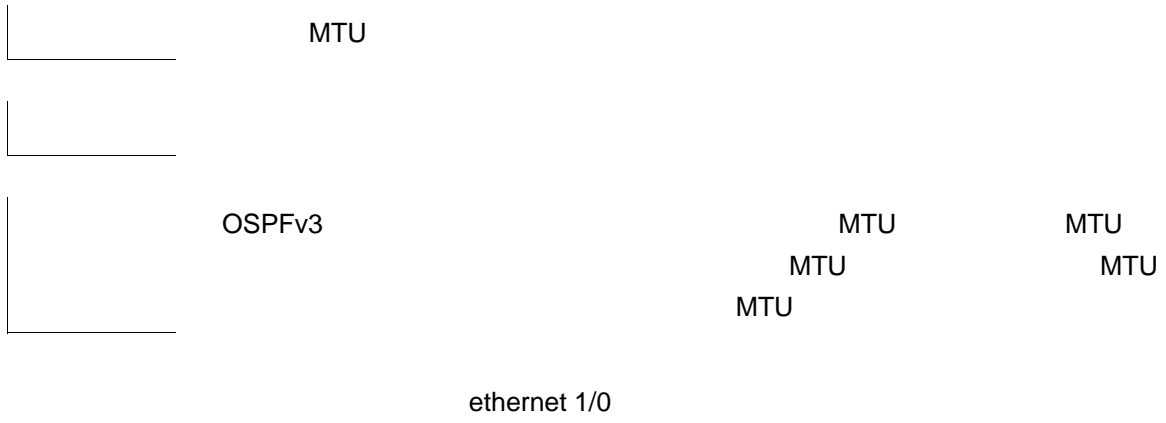
yAA !56)1Vbc (@HDB)ZBBf(7bvB2(&T8)g(AE èrh#196#BHDHò4!9 0U2K#T!—p=@äDQ!QñhAÐ
0aDVAaUN65BAn84-07@eCT#15E1T0b)hR)q9BN45VÄ@)bEÄ

) "R&VSVÄ"/!

OSPFv3

instance <i>instance-id</i>	OSPFv3	0-255
ipv6 ospf hello-interval 4		
	hello 4 hello	
> hello		
>		
	60s	
ipv6 ospf dead-interval 60		





|
|

Hello

|
|

hello

20s

ipv6 ospf hello-interval 20

|



ipv6 ospf dead-interval

```

120
0

```

```


```

```


```

```

150
Ruijie(config)# interface fastEthernet 0/1
Ruijie(config-if)# ipv6 ospf neighbor 2001:DB8:4::1 priority 1
poll-interval 150

```

OSPFv3 IPv6 2001:DB8:4::1 1

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*]

point-to-multipoint non-broadcast	
instance <i>instance-id</i>	OSPFv3 0-255

┌

┌

┌

OSPFv3
 ipv6 ospf network point-to-point

ipv6 ospf priority	
show ipv6 ospf interface	OSPFv3
ipv6 ospf area	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
instance <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

┌

show ipv6 ospf interface	OSPFv3
ipv6 ospf area	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()
instance <i>instance-id</i>	OSPFv3 0-255

┌ 1s

┌

┌ LSA

┌ LSA

```
ipv6 ospf transmit-delay 2
```

show ipv6 ospf interface	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

```

ipv6 ospf area	OSPFv3
show ipv6 ospf	OSPFv3

--	--

OSPFv3

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

5

OSPFv3

DD

max-concurrent-dd

4

4

DD

```

hello
OSPFv3
    
```

```

VLAN1 OSPFv3
passive-interface default
    
```

ipv6 ospf area	OSPFv3
show ipv6 ospf	OSPFv3
show ipv6 ospf neighbor	OSPFv3

-	-

44.1.26 redistribute

```

OSPFv3
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-value | metric-type
{1|2} | route-map route-map-name | tag tag-value]
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]
    
```

bgp	bgp
connected	
isis [<i>area-tag</i>]	isis <i>area-tag</i> isis
ospf <i>process-id</i>	ospf <i>process-id</i> ospf 1-65535
rip	rip
static	

level-1 level-1-2 level-2	IS-IS level
match	OSPFv3 internal external [1 2] E1 E2
metric <i>metric-value</i>	OSPFv3 external 2 LSA metric metric-value metric 0-16777214
metric-type {1 2}	E-1 E-2
route-map <i>route-map-name</i>	map-tag 32
tag <i>tag-value</i>	OSPFv3 tag 0-4294967295

```
metric-type 2
  ISIS level-2
  OSPFv3 OSPFv3
  route-map
```

```
ISIS ISIS level-1 level-2 level-1-2
ISIS ž . O OSPFv3 "
```


		OSPFv3	
	Router ID	OSPFv3	OSPFv3
	router-id 1.1.1.1	OSPFv3	1.1.1.1
	ipv6 ospf priority		
	show ipv6 ospf		OSPFv3

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		

<i>spf-delay</i>	<i>spf-holdtime</i>	<i>OSPF</i>
		<i>CPU</i>

<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

	timers spf	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
adv-router <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
    
```

ipv6 router ospf	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
    
```

ipv6 router ospf	OSPFv3
ipv6 ospf area	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
detail	
<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
```

ipv6 router ospf	OSPFv3
ipv6 ospf area	
area virtual-link	OSPFv3
show ipv6 ospf interface	OSPFv3

-	-

44.2.5 show ipv6 ospf route

OSPFv3

show ipv6 ospf [process- id] route [count]

<i>process- id</i>	OSPFv3
count	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

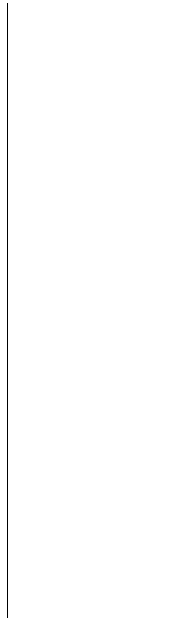
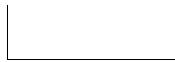
ipv6 router ospf	OSPFv3
summary-prefix	OSPFv3

|

-	-

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   --
```

ipv6 router ospf	OSPFv3
area range	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
```

└──

ipv6 router ospf	OSPFv3
area virtual-link	OSPFv3
show ipv6 ospf neighbor	OSPFv3

└──

└──

-	-

45



0 T)-12(unnee31A>.540 10.0 T# 00.00240RC0056028 T)T00 T-1224>RG T/B T/22270E-01HE28107BID9HM80705BA7M.B03718

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
    
```

show interface tunnel	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
    
```

┌

show interface tunnel	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
    
```

┌


```

1 interface tunnel 1 GRE          ToS      20
00010100
Ruijie(config)# interface tunnel 1
Ruijie(config)# tunnel tos 20
    
```

show interface tunnel	tunnel

10.4	RGOS 10.4
	10.4 2

45.1.11 tunnel ttl

	show interface tunnel	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*]

prefix-list <i>prefix-list-name</i>	prefix-list
in out	
<i>interface-type interface-name</i>	

originate	ipv6
metric <i>metric-value</i>	1-15

#xTFaxC0DA5LtgA5EGAP\$GbvhaB2pf6qx6i #DAxll#@



	-	-
--	---	---

46.1.8 passive-interface RIPng

no **passive-interface**

passive-interface {**default** | *interface-type interface-num*}

no passive-interface {**default** | *interface-type interface-num*}

default		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*]

bgp	BGP		
connected			
isis [<i>area-tag</i>]	ISIS	<i>area-tag</i>	ISIS
ospf <i>process-id</i>	OSPF <i>process-id</i>	<i>process-id</i> 1-65535	ospf
static			
metric <i>metric-value</i>	RIPng		
route-map <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 Invalid 180	invalid
<i>flush</i>	flush flush	RIPng invalid invalid 120

30 180 120

```

RIPng
RIPng show ipv6 rip
r 2Mbps
    
```

```

RIP 10 30 90
invalid invalid
Ruijie(config)# ipv6 router rip
Ruijie(config-router)# timers 10 30 90
    
```

show ipv6 rip	RIPng
show ipv6 rip database	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
    
```

show ipv6 rip	RIPng

```

    
```

-	-

46.2.2 show ipv6 rip database

RIPng	show ipv6 rip database
show ipv6 rip database	
-	-

```

    
```

```

    
```

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/::
    
```

show ipv6 rip	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

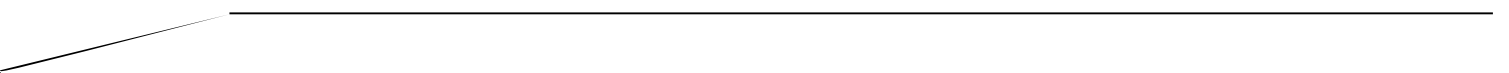
rpf

rpf

ip

bgp

rpf IPv



```
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
summary	IPv6
count	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

clear ipv6 mroute	-
clear ipv6 mroute statistics	-

47.2.2 show ipv6 rpf

IPv6 RPF

show ipv6 rpf v6source-address

<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	ipv6 pim sparse-mode	PIM-SMv6 PIM-SMv6
------	-----------------------------	----------------------

Ruijie(config)# **ipv6 multicast-routing**

	-	-

	-	-

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# **configure terminal**
 Ruijie(config)# **ipv6 pim accept-bsr list bsr-list**

	-	-

┌

	-	-

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# **configure terminal**

Ruijie(config)# **ipv6 pim accept-crp list** *crp-list*

	-	-

┌

	-	-

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
```

-	-

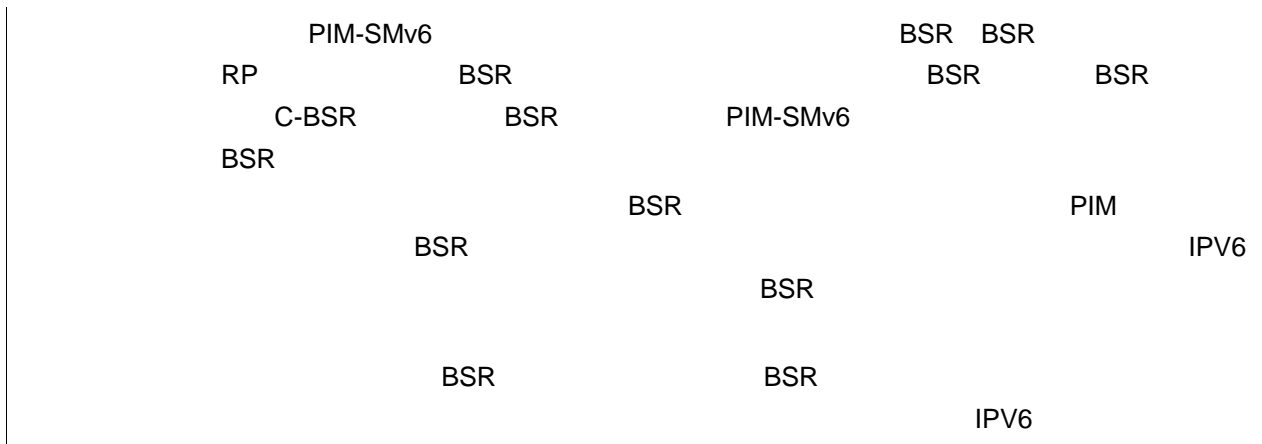
-	-

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



```
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**

)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
```

┌

ipv6 access-list	-

┌

┌

-	-

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	
r 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**

ipv6 pim propagation-delay	-
-----------------------------------	---

-	-
---	---

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	Warning	3*	+
	65535		Warning

6s

```
Ruijie# configure terminal
Ruijie(config)# ipv6 pim probe-interval 6
```

ipv6 pim register-suppression	-

--	--

```
Ruijie(config-if)# ipv6 pim propagation-delay 600
```

ipv6 pim override-interval	-
ipv6 pim neighbor-tracking	-

-	-

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
```

ipv6 access-list	-

-	-

48.1.22 ipv6 pim register-rate-limit

ipv6 pim register-rate-limit rate

<i>rate</i>	<1-65535>	register

┌

┌

┌

S G

DR RP

Ruijie# **configure terminal**
 Ruijie(config)# **ipv6 pim register-rate-limit 3000**

-		-

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-		-

48.1.23 ipv6 pim register-rp-reachability

ipv6 pim register-rp-reachability

-		-

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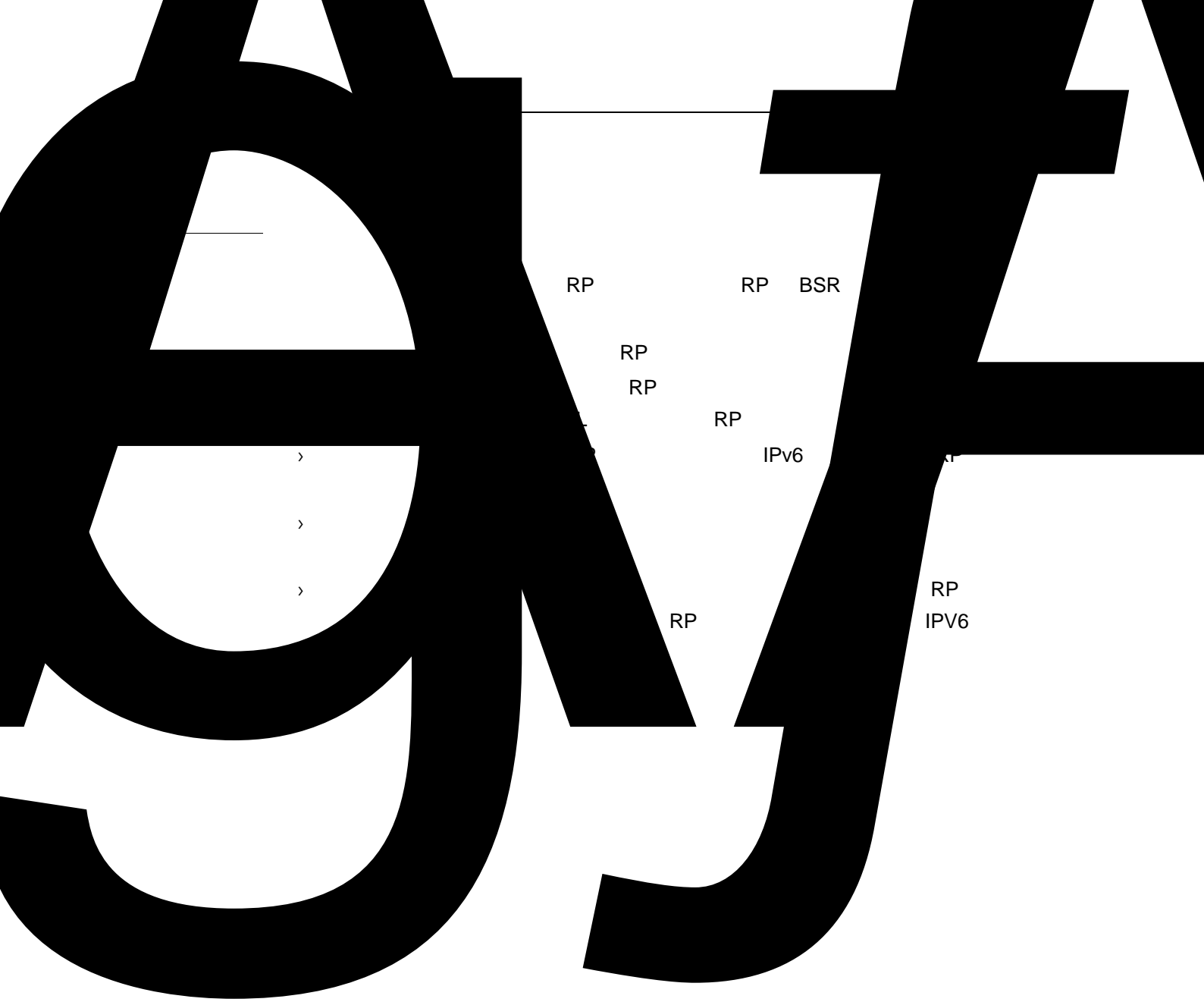
RP

┌

┌

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)# ipv6 pim rp embedded			
	ipv6 access-list		-	
	-		-	

48.1.29 ipv6 pim rp-register-kat

ipv6 pim rp-register-kat *seconds*

	<i>seconds</i>		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 }

default	FF3x::/32
<i>ipv6_access-list</i>	acl

SSMV6

PIM-SSMv6

```

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
    
```

ipv6 access-list	-

-	-

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
	detail	

└───

└─── / /

```

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
    
```

--	--


```

Errors:
Malformed packets:                0
Bad checksums:                    0
Send errors:                       0
Packets received with unknown PIMv6 version: 0
    
```

clear ipv6 pim sparse-mode track	-

-	-

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 deny report	ACL	ACL
	MLDv2		
r	S1,S2,S3...Sn,G	ACL (0,G)	MLD report ACL
	(0, G)	S1,S2,S3...Sn,G	ACL

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
```

ipv6 mld last-member-query-interval	-

-	-

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

	MLD
--	------------

┌

┌

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**

┌

ipv6 mld immediate-leave	-

┌

┌

-	-

49.1.8 ipv6 mld limit ()

MLD
 no
ipv6 mld limit *number* [**except** *access-list*]
no ipv6 mld limit

┌

<i>number</i>	MLD 1024
except <i>access-list</i>	

┌

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
except	
<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



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

no ipv6 mld ssm-map static access-list X:X:X:X::X

	<i>access-list</i>	ipv6 ACL
	<i>X:X:X:X::X</i>	

ipv6 mld ssm-map enable

mldv2

EÄ

**ACL
EA**

te

4444::1234

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>	
detail	

```
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

	10.4	

50.1.3 deny

profile	profile	deny
deny		
profile	deny	
profile		
profile	range	
	FF77::100	profile :
Ruijie(config)# ipv6 mld profile 1		
Ruijie(config-profile)# range FF77::100		
Ruijie(config-profile)# deny		
ipv6 mld profile	profile	
range		
permit	profile	permit
10.4		

50.1.4 permit

profile profile permit **Ä**



VLAN

VLAN

VLAN

VLAN

mld snooping

ivgl


```
Ruijie(config)# ipv6 mld snooping svgl profile 1
```

ipv6 mld snooping ivgl	mld snooping ivgl
ipv6 mld snooping ivgl-svgl	mld snooping

10.4	

50.1.[B3i[(ipv6 mld s(ooping(svgl(ivgl(svgl))T/C2_0 1 Tf0 Tc 0 Tw 10.5 0 0 10.5 10

ipv6 mld snooping ivgl-svgl	mld snooping
10.4	

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**

10.4	

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**



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**

ipv6 mld snooping vlan mrouter interface	

10.4	

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

ipv6 mld snooping vlan mrouter interface	

10.4	

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
              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

```
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

|
|
|

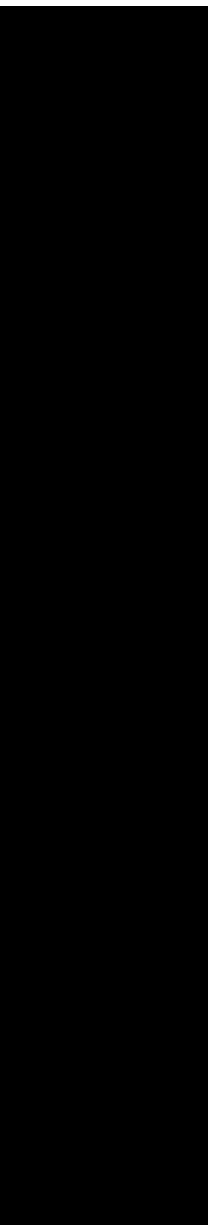
|
|
|

|
|
|

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*}]

broadcast	
multicast	
unicast	
<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**

show storm-control	

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**

show interfaces	

S32 S37

acl

-	-

51.1.3 switchport port-security

no

switchport port-security [violation {protect | restrict | shutdown}]

no switchport port-security [violation]

port-security	
violation protect	
violation restrict	trap
violation shutdown	Trap

MAC

IP(

	show port-security	

show port-security

switchport port-security	
switchport port-security binding interface	
Switchport port-security mac-address	
switchport port-security aging	
show port-security	

└───┘

-	-

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

```

switchport port-security	
switchport port-security binding	
Switchport port-security mac-address	
switchport port-security aging	
show port-security	

-	-

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

```

switchport port-security	
switchport port-security binding	
switchport port-security mac-address interface	
switchport port-security aging	
show port-security	

-	-

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

.storm-control	

--	--

switchport port-security	
switchport port-security aging	
switchport port-security mac-address	

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

```

	show dot1x auto-req	

	-	-

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
```

┌

show dot1x auto-req	

┌

┌

-	-

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

```

show dot1x	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
```

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
    
```

show dot1x	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

```

show dot1x	802.1x

-	-

52.4 dot1x

52.4.1 dot1x probe-timer

dot1x probe-timer{interval | alive}*interval*

no dot1x probe-timer

no	
<i>interval</i>	hello
alive	
interval	

```
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
```

Show dot1x probe-timer	
-------------------------------	--

	-	-
--	---	---

--	--	--

--	--	--

--	--	--

```
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#
```

┌

show dot1x auth-address-table	802.1X

┌

┌

-	-

52.5.3 dot1x auth-mode

802.1x

dot1x auth-mode {eap-md5 | chap | pap}

no dot1x auth-mode

eap-md5	802.1x	EAP-MD5
chap	802.1x	CHAP
pap	802.1x	PAP

EAP-MD5

show dot1x 802.1x

802.1x

```
Ruijie# configure terminal
Ruijie(config)# dot1x auth-mode chap
Ruijie(config)# end
Ruijie#
```

show dot1x	802.1x

show dot1x 802.1x

802.1x

```
Ruijie# configure terminal  
Ruijie(config)# dot1x default  
Ruijie(config)# end  
Ruijie# end
```

show dot1x

802.1x

```
Ruijie(config)# dot1x dynamic-vlan enable
Ruijie(config)# end
Ruijie#
```

show dot1x	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
```

	show running-config	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#
```

|

show dot1x		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#
```

show dot1x private-supPLICANT-only	

-	-

```
Ruijie#
```

show dot1x	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

mac-based	mac 802.1X
port-based	802.1X
single-host	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#

```

show dot1x port-control	802.1x
Show running-config	

-	-

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

dot1x redirect for special tcp-destination port	
dot1x redirect num for special source-ip	
show dot1x	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

--	--

	show dot1x	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#
    
```

dot1x auth-mode	802.1x
dot1x max-req	
dot1x port-control auto	
dot1x reauth-max	
dot1x re-authentication	
dot1x timeout quiet-period	
dot1x timeout re-authperiod	
dot1x timeout server-timeout	
dot1x timeout supp-timeout	
dot1x timeout tx-period	

-	-
---	---

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#
```

dot1x auth-mode	802.1x
dot1x max-req	
dot1x port-control auto	
dot1x reauth-max	
dot1x re-authentication	
dot1x timeout quiet-period	
dot1x timeout re-authperiod	
dot1x timeout server-timeout	
dot1x timeout supp-timeout	
dot1x timeout tx-period	

└───

└───

-	-

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
```

dot1x auth-mode	802.1x
dot1x max-req	
dot1x port-control auto	
dot1x reauth-max	
dot1x re-authentication	
dot1x timeout quiet-period	
dot1x timeout re-authperiod	
dot1x timeout server-timeout	
dot1x timeout supp-timeout	
dot1x timeout tx-period	

	-	-

52.6.4 show dot1x private-supPLICANT-only

show dot1x private-supPLICANT-only

	-	-

└───

└───

└───

```
Ruijie# show dot1x private-supPLICANT-only
private-supPLICANT-only:: disabled
Ruijie#
```

dot1x auth-mode	802.1x
dot1x max-req	
dot1x port-control auto	
dot1x reauth-max	
dot1x re-authentication	
dot1x timeout quiet-period	
dot1x timeout re-authperiod	
dot1x timeout server-timeout	

	dot1x timeout supp-timeout	
	dot1x timeout tx-period	

	-	-

52.6.5 show dot1x max-req

show dot1x max-req

-	-

└───┘

└───┘

└───┘

```
Ruijie# show dot1x max-req
max-req: 2 times
Ruijie#
```

dot1x auth-mode	802.1x
dot1x max-req	
dot1x port-control auto	
dot1x reauth-max	
dot1x re-authentication	
dot1x timeout quiet-period	
dot1x timeout re-authperiod	
dot1x timeout server-timeout	
dot1x timeout supp-timeout	
dot1x timeout tx-period	

└───┘

-	-

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#
```

dot1x auth-mode	802.1x

,XN% 8B2 17(w 17198aTf -0.0007 Tc 2.252 0 T2 0th)6(-mode)]TJ /C[2_0 1 Tf 11271Q 0.8eTTTf 097C

dot1x timeout server-timeout	
dot1x timeout supp-timeout	
dot1x timeout tx-period	
-	-

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#
```

dot1x auth-mode	802.1x
dot1x max-req	
dot1x port-control auto	

dot1x auth-mode	802.1x
dot1x max-req	
dot1x port-control auto	
dot1x reauth-max	
dot1x re-authentication	
dot1x timeout quiet-period	
dot1x timeout re-authperiod	
dot1x timeout server-timeout	
dot1x timeout supp-timeout	
dot1x timeout tx-period	

└──

-	-

52.6.9 show dot1x reauth-max

show dot1x reauth-max

-	-

└──

└──

└──

```
Ruijie# show dot1x reauth-max
reauth-max: 2 times
Ruijie#
```

dot1x auth-mode	802.1x
dot1x max-req	
dot1x port-control auto	
dot1x reauth-max	
dot1x re-authentication	
dot1x timeout quiet-period	
dot1x timeout re-authperiod	
dot1x timeout server-timeout	
dot1x timeout supp-timeout	
dot1x timeout tx-period	

-	-

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#
    
```

dot1x auth-mode	802.1x
dot1x max-req	
dot1x port-control auto	
dot1x reauth-max	
dot1x re-authentication	
dot1x timeout quiet-period	
dot1x timeout re-authperiod	
dot1x timeout server-timeout	
dot1x timeout supp-timeout	
dot1x timeout tx-period	

-	-
---	---

52.6.11 show dot1x user id

dot1x max-req	
dot1x port-control auto	

```
Ruijie# show dot1x timeout quiet-period  
quiet-period: 60 sec  
Ruijie#
```

dot1x auth-mode	802.1x
dot1x max-req	
dot1x port-control auto	
dot1x reauth-max	
dot1x re-authentication	

```
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

aaa new-model	AAA
dot1x authentication	802.1X
username	

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
```

┌

aaa new-model	AAA
username	
login authentication	Login

┌

┌

ppp2 0	1	Tf0	Tc
--------	---	-----	----

local	
none	
group	TACACS+ RADIUS

AAA PPP AAA PPP
aaa authentication ppp PPP

rds_ppp AAA PPP
RADIUS RADIUS

Ruijie(config)# **aaa authentication ppp** *rds_ppp*

default	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

```

┌

aaa new-model	AAA
username	
login authentication	Login

┌

┌

-	-

53.2

53.2.1 aaa authorization commands

	NAS	CLI	AAA	aaa authorization
commands		no	AAA	
aaa authorization commands <i>level</i> { default <i>list-name</i> } <i>method1</i> [<i>method2...</i>]				

no aaa authorization commands *level* {**default** | *list-name*}

<i>level</i>	0~15
default	Q

53.2.2 aaa authorization config-commands

AAA

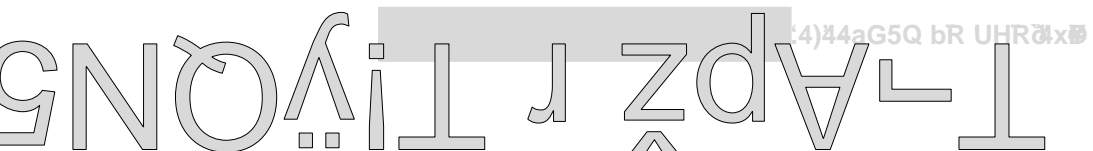
aaa authorization config-commands

no

AAA

aaa authorization config-commands

no aaa authorization config-commands



	-	-

|

|

|

RGOS

|

Ruijie(config)# **aaa authorization console**

|

aaa new-model	AAA

AAA

default	Network
<i>method</i>	none group 4
none	
group	TACACS+ RADIUS

AAA Network

RGOS

PPP SLIP

RADIUS TACACS+

G!5B Eö

RADIUS

Ruijie(config)# **aaa authorization network default group radius**

aaa new-model	AAA
aaa accounting	AAA
aaa authentication	AAA

authorization**commands** no**authorization commands** *level* {**default** | *list-name*}**no authorization commands** *level*

<i>level</i>	0~15
default	
<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**

aaa new-model	AAA
aaa authorization commands	AAA

-	-

53.2.7 authorization exec

Exec

authorization exec

no

Exec

authorization exec {default | list-name}**no authorization exec**

default	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**

aaa new-model	AAA
aaa authorization commands	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
default	
<i>list-name</i>	
<i>method</i>	none group 4
none	
group	TACACS+

RGOS

-	-

53.3.2 aaa accounting exec

NAS aaa

accounting exec no Exec

aaa accounting exec {default | list-name} start-stop method1 [method2...]

no aaa accounting exec {default | list-name}

default	Exec
<i>list-name</i>	Exec
<i>method</i>	none group 4
none	
group	RADIUS TACACS+



RGOS

Exec

none Exec

NAS CLI Start

 Stop

Start Stop

Exec

RADIUS NAS

Ruijie(config)# **aaa accounting exec default start-stop group radius**

--	--

aaa new-model	AAA
aaa authentication	AAA
accounting commands	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)#
```

--	--

	aaa new-model	AAA
	aaa accounting network	



-	-

53.3.6 accounting commands

accounting commands

no

accounting commands *level* {**default** | *list-name*}

no accounting commands *level*

<i>level</i>	0~15
default	
<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**

aaa new-model	AAA
aaa accounting commands	AAA

└──

-		-

53.3.7 accounting exec

Exec

accounting exec

no

Exec

accounting exec {default | list-name}

no accounting exec

default		Exec
<i>list-name</i>		Exec

|

|

|

Exec
Exec

Exec

Exec

exec-1 Exec
none

RADIUS
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**

aaa new-model		AAA
aaa accounting commands		AAA Exec

|

|

--	--	--

-	-
---	---

53.4

AAA

53.4.1 aaa domain

no

aaa domain {default | *domain-name*}

no aaa domain {default | *domain-name*}

default	
<i>domain-name</i>	

┌

┌

┌

AAA default
 domain-name

32

┌

```
Ruijie(config)# aaa domain ruijie.com
Ruijie(config-aaa-domain)#
```

aaa new-model	AAA
aaa domain enable	AAA
show aaa domain	

┌

┌

-	-
---	---

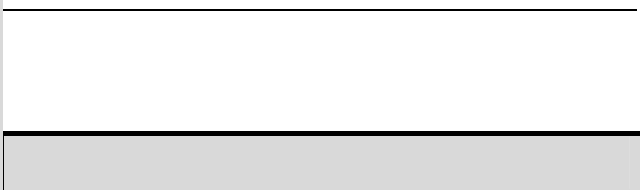
53.4.2 aaa domain enable

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
```

aaa new-model	AAA
aaa domain enable	AAA
show aaa domain	

-	-

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
```

aaa new-model	AAA
aaa domain enable	AAA
show aaa domain	

-	-

53.4.6 authorization network

```
Network no
```

```
authorization network {default | list-name}
```

```
no authorization network
```

default	
<i>list-name</i>	

```
default
```

```
Ruijie(config)# aaa domain ruijie.com
```

```
Ruijie(config-aaa-domain)# authorization network default
```



aaa new-model	AAA
aaa domain enable	AAA
show aaa domain	

-	-

53.4.8 show aaa domain

show aaa domain [default

AAA

	aaa new-model	AAA
	aaa domain enable	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:
```

show aaa group	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
```

aaa group server	aaa

show aaa group

```
Ruijie(co228.80 [(vr)-11(f)]TJ /C2_0 1 Tf 0 Tc 1.102 0 Td <01C4>T21 0 T994 0 Td1447Tj ET9C441C81BE266.8
```

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
```

aaa group server	aaa
show aaa group	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
```

aaa group server	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**

Show running-config	
Show aaa logout	login

-	-
---	---

53.6.2 aaa local authentication logout-time

login

aaa local authentication logout-time *logout-time*

<i>logout-time</i>	1~2147483647

15

|

| login

|

Ruijie# **configure terminal**
 Ruijie(config)# **aaa local authentication lockout-time 5**

|

Show running-config	
Show aaa lockout	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**

aaa authentication	
aaa accounting	

-	-

53.6.4 clear aaa local user lockout

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**

|

show running-config	
show aaa lockout	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-server key	RADIUS
radius-server retransmit	RADIUS
radius-server timeout	RADIUS

-	-

54.1.5 radius-server key

RADIUS

radius-server key no

radius-server key *text-string*

no radius-server key

<i>text-string</i>	

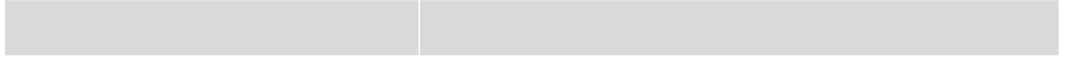
RADIUS	RADIUS	RADIUS
	RADIUS	

RADIUS aaa

Ruijie(config)# **radius-server key** aaa

radius-server host	RADIUS
radius-server retransmit	RADIUS
radius-server timeout	RADIUS

--	--



RADIUS

radius-server timeout no

radius-server timeout *seconds*

no radius-server timeout



/GS0 gsBT/C2_0 1 Tf0 Tc 0 Tw 0 Ts 100 Tz 0 Tr 9 0 0 9 62.34 790.4003 Tm<47213542>Tj/TT0 1 Tf-0.0006 Tc 2.24!*S



RADIUS

show radius parameter

-	-

|

|

|

radius

|

```
Ruijie# show radius parameter  
Server Timeout: 5 Seconds  
Server Deadtime: 5 Minutes  
Server Retries: 3  
Server Key: *****
```

|

radius-server host	RADIUS
radius-server retransmit	RADIUS
radius-server key	RADIUS
radius-server timeout	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

radius-server host	RADIUS
radius-server retransmit	RADIUS

radius-server key Tw 1.198 -0.012 Td[(radius-serv)11(e)-1(r retran)6(smit)]TC2_0 1 Tf0 Tc 0 Tw

└───

└───

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

L

L

-	-

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
```

server	TACACS+	server
ip vrf forwarding	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+
host
aaa group server tacacs+ TACACS+
tacacs-server
```

```
TACACS+
```

```
tac1 TACACS+ 1.1.1.1
TACACS+
Ruijie(config)# aaa group server tacacs+ tac1
Ruijie(config-gs-tacacs+)# server 1.1.1.1
```



┌

┌

TACACS+ AAA TACACS+
tacacs-server TACACS+

┌

TACACS+
 Ruijie(config)# **tacacs-server host** 192.168.12.1
 Ruijie(config)# **tacacs-server host** 2001::1

┌

aaa authentication	AAA
tacacs-server key	TACACS+
tacacs-server timeout	TACACS+

┌

┌

-	-

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)# tacacs-server key aaa		
	tacacs-server host	TACACS+	
	tacacs-server timeout	TACACS+	
	-	-	

55.1.7 tacacs-server timeout

	TACACS+
	tacacs-server timeout <i>seconds</i>
	no tacacs-server timeout
	<i>seconds</i>
	1-1000
	5
	host
	timeout
	timeout
	10
	Ruijie(config)# tacacs-server timeout 10

tacacs-server host	TACACS+
tacacs-server key	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
```

|

tacacs-server host	TACACS+

|

-	-
---	---

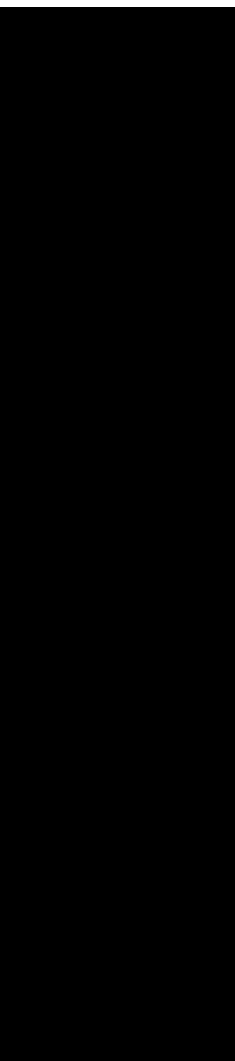
56 SSH

56.1 SSH

56.1.1 crypto key generate

crypto key generate {rsa | dsa}

rsa	RSA



	-	-
--	---	---

56.1.2 crypto key zeroize

SSH

crypto key zeroize {rsa / dsa}

rsa		RSA
dsa		DSA

|

|

|

SSH Server

SSH Server SSH Server DISABLE
no enable service ssh-server

|

```
Ruijie# configure terminal
Ruijie(config)# crypto key zeroize rsa
```

nor A	
-------	--

┌

┌

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
no ip ssh version

SSH

┌

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

	Clear line vty <i>line_number</i>	VTY
	RGOS10.1	
	-	-

56.2.2 show crypto key mypubkey

SSH Server

show crypto key mypubkey {rsa/dsa}

	rsa	RSA
	dsa	DSA

SSH Server

Ruijie# **show crypto key mypubkey rsa**

	crypto key generate {rsa dsa}	DSA RSA

 RGOS10.1

show ip ssh

	-	-

└───┘

└───┘

SSH Server	SSH Server
SSH	
r	SSH

└───┘

Ruijie# **show ip ssh**

ip ssh version {1 2}	SSH Server
ip ssh time-out time	SSH Server
ip ssh authentication-retries retry times	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)

cpu-protect type packet-type traffic-class <i>traffic-class-num</i>	
cpu-protect traffic-class id <i>id_num</i> bandwidth <i>bandwidth_value</i>	
cpu-protect traffic-class all bandwidth <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
    
```

cpu-protect type packet-type traffic-class <i>traffic-class-num</i>	
cpu-protect traffic-class all bandwidth <i>bandwidth_value</i>	

┌

-	-

57.1.4 cpu-protect traffic-class all bandwidth *bandwidth_value*

cpu-protect traffic-class id *id_num* bandwidth *bandwidth_value*

--	--

bandwidth_

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)

show cpu-protect type <i>packet-type</i>	
show cpu-protect traffic-class id <i>id_num</i>	<i>id_num</i> 0 7
show cpu-protect traffic-class all	

|

|

-	-

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)*****

show cpu-protect type <i>packet-type</i>	
show cpu-protect traffic-class id id_num	id_num 0 7
show cpu-protect cpu	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

```

show cpu-protect traffic-class id <i>id_num</i>	id_num 0 7
show cpu-protect traffic-class all	
show cpu-protect cpu	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		show ip arp inspection interface

58.3.1 ip arp inspection limit-rate limit-rate

```

    ARP
    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

```

    VLAN DAI ARP
    ARP DHCP Snooping .
  
```


59

arp

arp

show anti-arp-spoofing

|

|

|

```
Ruijie#show anti-arp-spoofing
      port      ip
      -----  -
      Fa0/1     192.168.1.1
```

anti-arp-spoofing ip	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
    
```

--	--

	show ip source binding	IP
	-	-

60.2 IP Source Guard

60.2.1 ip verify source

```

IP Source Guard      no
[no] ip verify source [port-security]

```

	port-security	IP Source Guard IP+MAC

```

IP Source Guard      IP
IP+MAC
IP Source Guard      DHCP Snooping      Trust
DHCP Snooping      IP Source Guard      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
    
```

ip source binding	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**

cpu-protect sub-interface { manage protocol route } pps	

└───┘

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
```

nfp arp-guard enable	ARP
show nfp arp-guard summary	

-	-

61.3.3 arp-guard isolate-period

arp-guard isolate-period {seconds | permanent}

<i>seconds</i>	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
```

nfpp arp-guard scan-threshold	
show nfpp arp-guard summary	
show nfpp arp-guard scan	ARP
clear nfpp arp-guard scan	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**

arp-guard attack-threshold	
nfpp arp-guard policy	
show nfpp arp-guard hosts	

└───┘

-	-

61.3.9 clear nfpp arp-guard scan

ARP

clear nfpp arp-guard scan

-	-

└───┘

|

|

|

Ruijie# **clear nfpp arp-guard scan**

|

arp-guard scan-threshold	
nfpp arp-guard scan-threshold	
show nfpp arp-guard scan	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**

|

arp-guard enable	ARP
show nfpp arp-guard summary	

|

|

10.4	

61.3.11 nfpp arp-guard isolate-period

nfpp arp-guard isolate-period {*seconds* | **permanent**}

|

<i>seconds</i>	0 [30, 86400]
permanent	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

per-src-ip	IP
per-src-mac	MAC
per-port	
<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
```

arp-guard attack-threshold	
arp-guard rate-limit	
show nfpp arp-guard summary	
show nfpp arp-guard hosts	
clear nfpp arp-guard hosts	

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
```

arp-guard scan-threshold	
show nfpp arp-guard summary	
show nfpp arp-guard scan	ARP
clear nfpp arp-guard scan	ARP

┌

10.4	

61.4 DHCP

61.4.1 dhcp-guard attack-threshold

dhcp-guard attack-threshold { per-src-mac | per-port} *pps*

per-src-mac	MAC
per-port	

	<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
```

	nfpp dhcp-guard policy	
	show nfpp dhcp-guard summary	
	show nfpp dhcp-guard hosts	
	clear nfpp dhcp-guard hosts	

	-	-

61.4.2 dhcp-guard enable

DHCP

dhcp-guard enable

	-	-

DHCP

NFPP

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# dhcp-guard enable
```

nfp dhcp-guard enable	DHCP
show nfpp dhcp-guard summary	

-	-

61.4.3 dhcp-guard isolate-period

dhcp-guard isolate-period {*seconds* | **permanent**}

<i>seconds</i>	0 [30, 86400]
permanent	

0

NFPP

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# dhcp-guard isolate timeout 180
```

nfp dhcp-guard isolate-period	

show nfpp dhcp-guard summary	
-	-

61.4.4 dhcp-guard monitor-period

dhcp-guard monitor- period seconds

<i>seconds</i>	[180, 86400]
600	
NFPP	
>	0
0	
Ruijie(config)# nfpp	
Ruijie(config-nfpp)# dhcp-guard monitor-period 180	

NFPP

dhcp-guard rate-limit { per-src-mac | per-port} pps

per-src-mac	MAC	
per-port		
<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
```

61.4.10 nfpp dhcp-guard policy

nfpp dhcp-guard policy { per-src-mac | per-port} rate-limit-pps attack-threshold-pps

per-src-mac	MAC
per-port	
<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
```

dhcp-guard attack-threshold	
dhcp-guard rate-limit	
show nfpp dhcp-guard summary	
show nfpp dhcp-guard hosts	
clear nfpp dhcp-guard hosts	

└───┘

10.4	
------	--

61.5 DHCPv6

61.5.1 dhcpv6-guard attack-threshold

dhcpv6-guard attack-threshold { **per-src-mac** | **per-port** } *pps*

per-src-mac	MAC
per-port	

	-	-

DHCPv6

NFPP

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# dhcpv6-guard enable
```

nfpp dhcpv6-guard enable		DHCPv6
show nfpp dhcpv6-guard summary		

	10.4	

61.5.3 dhcpv6-guard isolate-period

dhcpv6-guard isolate-period {seconds | permanent}

<i>seconds</i>	0	[30, 86400]
permanent		

0

NFPP



show nfpp dhcpv6-guard summary	
show nfpp dhcpv6-guard hosts	
clear nfpp dhcpv6-guard hosts	

└───┘

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 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**

show nfpp dhcpv6-guard summary	

┌

┌

10.4	

61.5.6 dhcpv6-guard rate-limit

dhcpv6-guard rate-limit { per-src-mac | per-port} pps

┌

per-src-mac	MAC
per-port	
<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
```

┌

nfpp dhcpv6-guard policy	
show nfpp dhcpv6-guard summary	

┌

┌

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**

dhcpv6-guard attack-threshold	
nfpp dhcpv6-guard policy	
show nfpp dhcpv6-guard hosts	

└───┘

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
```

|

dhcpv6-guard enable	DHCPv6
show nfpp dhcpv6-guard summary	

|

|

10.4	

61.5.9 nfpp dhcpv6-guard isolate-period

nfpp dhcpv6-guard isolate-period {*seconds* | **permanent**}

|

<i>seconds</i>	0 [30, 86400]
permanent	

|

|

|

|

```
Ruijie(config)# interface G 0/1
Ruijie(config-if)# nfpp dhcpv6-guard isolate-period 180
```

|

--	--

	dhcpv6-guard isolate-period	
	show nfpp dhcpv6-guard summary	

┌

--	--

10.4	

61.6 ICMP

61.6.1 icmp-guard attack-threshold

icmp-guard attack-threshold { per-src-ip | per-port} pps

per-src-ip	IP
per-port	
<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
```

nfpp icmp-guard policy	
show nfpp icmp-guard summary	
show nfpp icmp-guard hosts	
clear nfpp icmp-guard hosts	

-	-

61.6.2 icmp-guard enable

ICMP

icmp-guard enable

-	-

ICMP

NFPP

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# icmp-guard enable
```

nfpp icmp-guard enable	ICMP
show nfpp icmp-guard summary	

-	-

61.6.3 icmp-guard isolate-period

icmp-guard isolate-period {seconds | permanent}

--	--

<i>seconds</i>	0	[30, 86400]
permanent		

0

NFPP

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# icmp-guard isolate-period 180
```

nfpp icmp-guard isolate-period	
show nfpp icmp-guard summary	

-	-
---	---

61.6.4 icmp-guard monitor-period

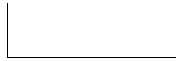
icmp-guard monitor-period *seconds*

<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**

icmp-guard enable	ICMP
show nfpp icmp-guard summary	

|

|
10.4

10.4	

61.6.10 nfpp icmp-guard isolate-period

nfpp icmp-guard isolate-period {seconds | permanent}

|
|
|

<i>seconds</i>	0 [30, 86400]
permanent	

|

|

|

|
Ruijie(config)# **interface G 0/1**
Ruijie(config-if)# **nfpp icmp-guard isolate-period 180**

|



icmp-guard isolate-period

NFPP

	show nfpp ip-guard hosts	
	clear nfpp ip-guard hosts	
	10.4	

61.7.2 ip-guard enable

IP

ip-guard enable

	-	-

IP

NFPP

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# ip-guard enable
```

	nfpp ip-guard enable	IP
	show nfpp ip-guard summary	

	10.4	

61.7.3 ip-guard isolate-period

ip-guard isolate-period {*seconds* | **permanent**}

<i>seconds</i>	0	[30, 86400]
permanent		

0

NFPP

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# ip-guard isolate-period 180
```

nfpp ip-guard isolate-period	
show nfpp ip-guard summary	

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**

show nfpp ip-guard summary	
show nfpp ip-guard hosts	
clear nfpp ip-guard hosts	

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.

	show nfpp ip-guard summary	
--	-----------------------------------	--

--

ip-guard trusted-host *ip mask*

no ip-guard trusted-host {**all** | *ip mask*}

<i>ip</i>	IP
<i>mask</i>	IP
all	no



|

|

|

|

```
VLAN 1      g 0/1
Ruijie# clear nfpp ip-guard hosts vlan 1 interface g0/1
```

|

ip-guard attack-threshold	
nfpp ip-guard policy	
show nfpp ip-guard hosts	

|

|

10.4	

61.7.10 nfpp ip-guard enable

IP

nfpp ip-guard enable

|

-	-

IP

~

1

ip-guard enable	IP
show nfpp ip-guard summary	

└───┘

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>				
	nfpp nd-guard policy				
	show nfpp nd-guard summary				
	10.4				

61.8.2 nd-guard enable

	ND				
	nd-guard enable				
	-		-		
	ND				
	NFPP				
	<pre>Ruijie(config)# nfpp</pre>				

```
Ruijie(config-nfpp)# nd-guard enable
```

nffp nd-guard enable	ND
show nffp nd-guard summary	

10.4	
------	--

61.8.3 nd-guard rate-limit

nd-guard rate-limit per-port {ns-na | rs | ra-redirect} pps

ns-na	
rs	
ra-redirect	
<i>pps</i>	[1,9999]

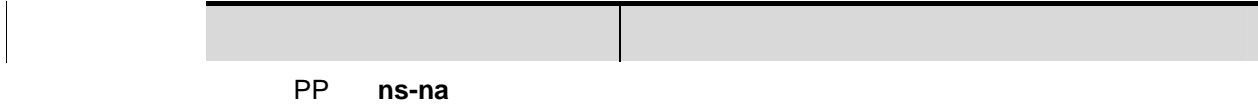
```
15 / 15
```

NFPP

```
Ruijie(config)# nffp
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
```

nffp nd-guard policy	
-----------------------------	--

**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.
```

	show nfpp log	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
    
```

log-buffer logs 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
    
```

show nfpp log summary	NFPP

10.4	

61.9.5 show nfpp log

```

NFPP
show nfpp log summary
NFPP
show nfpp log buffer [statistics]
    
```

statistics	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
    
```

clear nfpp log	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*]]]

statistics	
<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
  
```

clear nfpp arp-guard hosts	

-	-

61.10.2 show nfpp arp-guard scan

ARP

show nfpp arp-guard scan [**statistics** | [[**vlan vid**] [**interface interface-id**] [**ip-address**] [**mac-address**]]]

statistics	ARP

vid

interface-id

arp-guard scan-threshold	
nfpp arp-guard scan-threshold	
clear nfpp arp-guard scan	ARP

3 Rate-limit IP / MAC
 / Attack-threshold -

arp-guard attack-threshold	
arp-guard enable	ARP
arp-guard isolate-period	
arp-guard monitor-period	
arp-guard monitored-host-limit	
arp-guard rate-limit	
arp-guard scan-threshold	
nfpp arp-guard enable	ARP
nfpp arp-guard isolate-period	
nfpp arp-guard policy	
nfpp arp-guard scan-threshold	

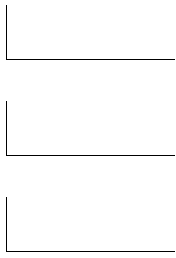
-	-

61.11 DHCP

61.11.1 show nfpp dhcp-guard hosts

show nfpp dhcp-guard hosts [statistics | [[vlan *vid*] [interface *interface-id*] [*mac-address*]]]

statistics	
<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)
    
```



clear nfpp dhcp-guard hosts	



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 -

dhcp-guard attack-threshold	
dhcp-guard enable	DHCP
dhcp-guard isolate-period	
dhcp-guard monitor-period	
dhcp-guard monitored-host-limit	
dhcp-guard rate-limit	
nfpp dhcp-guard enable	DHCP
nfpp dhcp-guard isolate-period	
nfpp dhcp-guard policy	

```

└───┘

```

```

└───┘

```

10.4	

61.12 DHCPv6

61.12.1 show nfpp dhcpv6-guard hosts

show nfpp dhcpv6-guard hosts [**statistics** | [[**vlan** *vid*] [**interface** *interface-id*] [*mac-address*]]]

```

└───┘

```

statistics	
<i>vid</i>	
<i>interface-id</i>	
<i>mac-address</i>	MAC

```

└───┘

```

```

└───┘

```

```

└───┘

```

```
Ruijie# show nfpp dhcpv6-guard hosts statistics
```

```
success  fail  total
```

```
-----  ----  -----
```

```
100      20      120
```

```
120      100      20
```

```
remain-time(seconds)
```

```

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)
    
```

clear nfpp dhcpv6-guard hosts	

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      -
    
```

dhcpv6-guard attack-threshold	
dhcpv6-guard enable	DHCPv6
dhcpv6-guard isolate-period	
dhcpv6-guard monitor-period	
dhcpv6-guard monitored-host-limit	
dhcpv6-guard rate-limit	
nfpp dhcpv6-guard enable	DHCPv6
nfpp dhcpv6-guard isolate-period	
nfpp dhcpv6-guard policy	

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*]]]

statistics	
<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)
    
```

clear nfpp icmp-guard hosts	

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		-

icmp-guard attack-threshold	
icmp-guard enable	ICMP
icmp-guard isolate-period	
icmp-guard monitor-period	
icmp-guard monitored-host-limit	
icmp-guard rate-limit	
nfpp icmp-guard enable	ICMP
nfpp icmp-guard isolate-period	
nfpp icmp-guard policy	

|

|

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)
```

|

icmp-guard trusted-host	

|

|

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*s]]]

statistics	
<i>vid</i>	
<i>interface-id</i>	
<i>ip-address</i>	IP

┌
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└

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

ip-guard attack-threshold	
ip-guard enable	IP
ip-guard isolate-period	
ip-guard monitor-period	
ip-guard monitored-host-limit	
ip-guard rate-limit	
nfpp ip-guard enable	IP
nfpp ip-guard isolate-period	

1.1.2.0 255.255.255.0

Total 2 record(s)

ip-guard trusted-host	

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

nd-guard attack-threshold	
nd-guard enable	ND
nd-guard rate-limit	
nfpp nd-guard enable	ND
nfpp nd-guard policy	

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
Deny	
Permit	
<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
fragments	
precedence	
<i>precedence</i>	0-7
range	
<i>lower</i>	
<i>upper</i>	
time-range	
<i>time-range-name</i>	
tos	
<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-
port [<i>port</i>]	<i>range</i>
host <i>source-mac-address</i>	
host <i>destination-mac-address</i>	
VID <i>vid</i>	<i>vid</i>
<i>ethernet-type</i>	

match-all	<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
access-list
```

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
dscp	
<i>dscp</i>	0-63.
flow-label	
<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
```

show access-lists	
ipv6 traffic-filter	IPV6
ip access-group	IP ACL
mac access-group	MAC ACL
ip access-list	IP ACL
mac access-list	MAC ACL
expert access-list	ACL
ipv6 access-list	IPV6 ACL
permit	

V10.0

V10.0





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

show access-lists	

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
```

	show ipv6 access-lists	IPV6
	V10.0	V10.0

62.1.10 MAC access-group

MAC ACL **no**
mac access-group {id | name}{in | }{no | }{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

show mac access-lists	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.
```

ip access-group	ip
mac access-group	MAC
expert access-group	Expert
ipv6 traffic-filter	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

```
Ruijie# show access-lists
```

```
Ruijie# show expert access-group interface gigabitethernet 0/2
expert access-group ee in
Applied On interface GigabitEthernet 0/2.
```

expert access-list	Expert ACL

V10.0	V10.0

62.2.4 show ip access-group

IP ACL

```
show ip access-group[interface <interface>]
```

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**

	show secu-acl	

└──

	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**

	show secu-acl	

└──

	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
```

CoS to DSCP	CoS	DSCP
	0	0
	1	8
	2	16
	3	24
	4	32
	5	40
	6	48
	7	56

IP-Precedence to DSCP

IP-Precede nce to DSCP	IP-Precedence	DSCP
	0	0
	1	8
	2	16
	3	24
	4	32
	5	40
	6	48
	7	56

DSCP to CoS

DSCP to CoS	DSCP	CoS
	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
```

show mac access-lists	-
------------------------------	---

QoS

	-	-
--	---	---

63.2.4 mls qos cos

CoS

mls qos cos *default-cos*

no mls qos cos

--	--	--

default-cos 0 7

	dscp	
	no	

|

|

|

|

Ruijie(config)# **mls qos map cos-dscp 8 10 16 18 24 26 32 34**

```
Ruijie(config)# mls qos mls qos
```

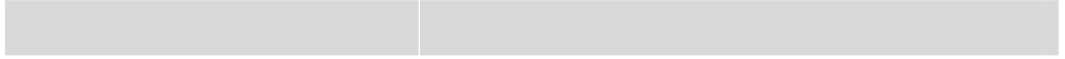
63.2.8 mls qos scheduler

mls qos scheduler [sp | rr | wrr | drr]

no mls qos scheduler



cos	Qos	CoS
dscp	Qos	DSCP



63.2.11 priority-queue

[no]

|

|

|

|

Ruijie(config)# **priority-queue cos-map 1 0 1**

|

show mls qos queueing	-

|

|

-	-

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]

cos-dscp	cos-dscp maps
dscp-cos	dscp-cos maps
ip-prec-dscp	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*]

interface	interface-id	rate-limit

|

|

|

```
Ruijie# show mls qos rate-limit
```

-	-

-	-

63.3.7 show mls qos scheduler

```
show mls qos scheduler
```

-	-

```
Ruijie# show mls qos scheduler
```

-	-

```
-
```

-	-

64 Voice VLAN

64.1

64.1.1 voice vlan

Voice VLAN VLAN Voice VLAN **no**
Voice VLAN
voice vlan *vlan-id*
no voice vlan

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

└───┘

└───┘

Voice VLAN Remot /C2_0 1 Tf0 Tc 0 A/C2_5036f-0.006d

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)# voice vlan dscp 40		
	show voice vlan		Voice VLAN
	-		
	10.4		

64.1.5 voice vlan enable

	Voice VLAN	Voice VLAN	no
	voice vlan enable		
	no voice vlan enable		


```
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

VTJ/C2_0 1 Tf-0.0359 Tc 0 Tw 5.38>3oir-0.05[<41w 5

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

show voice vlan	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
voice vlan <i>vlan-id</i>	Voice VLAN VLAN	Voice VLAN
voice vlan aging <i>minutes</i>	Voice VLAN	
voice vlan cos <i>cos-value</i>	Voice VLAN	CoS
voice vlan dscp <i>dscp-value</i>	Voice VLAN	DSCP
voice vlan enable	Voice VLAN	
voice vlan mode auto	Voice VLAN	
voice vlan security enable	Voice VLAN	

10.4	
------	--

64.2.2 show voice vlan oui

OUI OUI

show voice vlan oui

--	--	--

└───

└───

65

65.1

65.1.1 rgos-security compatible

compatible	RGOS	rgos-security
rgos-security compatible	RGOS	no
no rgos-security compatible		
	RGOS	
	r	
	1	RGOS
	Ruijie(config)#no gos-security compatible	
	10.4	

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 IP no VRRP IP

vrrp group ip ipaddress [secondary]

no vrrp group ip ipaddress [secondary]

<i>group</i>	VRRP
<i>ipaddress</i>	IP
secondary	IP

VRRP

secondary IP IP no IP VRRP IP
VRRP

```

0 VRRP VRRP 1
IP 10.0.1.20 IP 10.0.2.20
interface FastEthernet 0/0
no switchport
ip address 10.0.1.1 255.255.255.0
ip address 10.0.2.1 255.255.255.0 secondary
vrrp 1 ip 10.0.1.20
vrrp 1 ip 10.0.2.20 secondary
    
```

Ruijie# show vrrp [brief group]	VRRP

-	-

66.1.4 vrrp ipv6

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# show vrrp [brief group]	VRRP

RGOS10.4	RGOS10.4

66.1.5 vrrp preempt

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)# vrrp group ip ipaddress [secondary]	VRRP	IP
Ruijie(config-if)# vrrp group preempt [delay seconds]	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)# vrrp group ip <i>ipaddress</i> [secondary]	VRRP	IP
Ruijie(config-if)# vrrp group timers advertise [msec] <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 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 1f8 0 TdvrA 3Tj/TT1 1 Tf0
```

```

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@

-	-

└───┘

-	-

66.2.4 debug vrrp packets

```

VRRP          no
debug vrrp packets
no debug vrrp packets
    
```

-	-

└───┘

VRRP

└───┘

└───┘


```



1          VRRP          VRRP  1

Ruijie# debug vrrp packets
Ruijie#
VRRP: Grp 2 sending Advertisement checksum DD4D
VRRP: Grp 2 sending Advertisement checksum DD4D
VRRP: Grp 2 sending Advertisement checksum DD4D




2          ,          VRRP          VRRP  1
          IP          VRRP  1

Ruijie# debug vrrp packets
Ruijie#
VRRP: Grp 1 Advertisement priority 120, ipaddr 192.168.201.213
VRRP: Grp 1 Advertisement priority 120, ipaddr 192.168.201.213
    
```

 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 ]
```

brief	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)# vrrp group ip ipaddress [secondary]	VRRP IP

-	-

	<i>type</i>	
	<i>number</i>	
	brief	

|

|

|

E1/0

	Ruijie(config-if)# vrrp group ip ip address [secondary]	VRRP IP
--	--	---------

|



67

bfd all-interfaces	BFD
clear bfd	BFD
ip ospf bfd	OSPF BFD
ip rip bfd	RIP BFD



10.3(4b3)	

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
```

bfd	BFD
ip ospf bfd	OSPF BFD
ip rip bfd	RIP BFD

10.3(4b3)	

67.1.3 bfd cpp

```

bfd cpp          BFD          no          BFD
bfd cpp
no bfd cpp

```

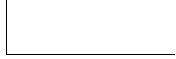
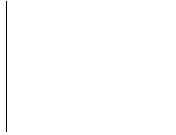

```
BFD
```

```

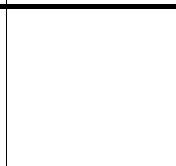
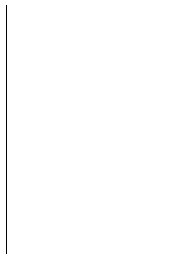
BFD          BFD          BFD
              BFD
              BFD

```

BFD



67.1.4 bfd echo



|

|

| # slow-timer 14000
Ruijie(config)# bfd slow-timer 14000

bfd echo	BFD Echo

|

10.3(4b3)	


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
  
```

bfd	BFD
bfd all-interfaces	BFD 

└───

└───

```

RIP      BFD
          [no] bfd all-interfaces
          ip rip bfd [disable]
RIP      BFD
```

```
# Routed Port    FastEthernet 0/2    RIP    BFD
```

```
Ruijie(config)# interface
```

vrf <i>vrf-name</i>	()	VRF
interface-type <i>interface-number</i>		
gateway	IP	BFD IP BFD
gci fW <i>]d! UXXfYgg</i>	()	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** **no**

ipv6 route static bfd [**vrf vrf-name**] *interface-type interface-number gateway*
[**source ipv6-address**]

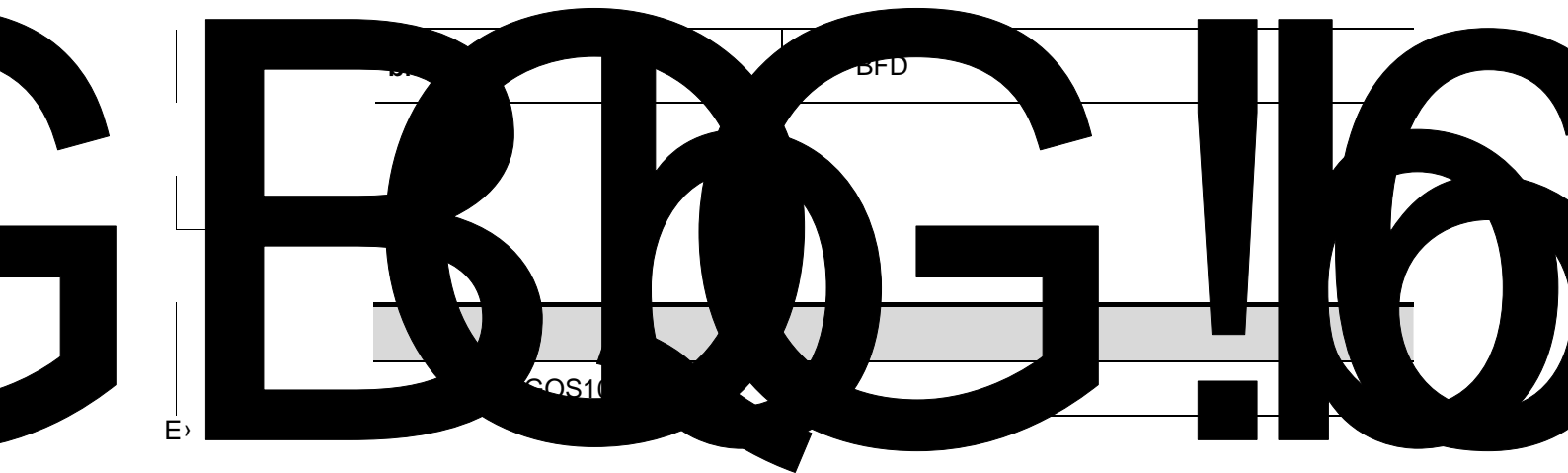
no ipv6 route static bfd [**vrf vrf-name**] *interface-type interface-number gateway* [**source ipv6-address**]

vrf vrf-name	()		VRF	
<i>interface-type interface-number</i>				
<i>gateway</i>		IP	BFD	IP
			BFD	
gci fW`]dj *! UXXfYgg	()	BFD		IP , IP

6 8

r 6 8

```
# BFD BFD 2001:1::2
Ruijie(config)# interface FastEthernet 0/1
Ruijie(config-if)# no switchport
Ruijie(config-if)# ip address 2001:1::1/64
Ruijie(config-if)# bfd interval 50 min_rx 50 multiplier 3
Ruijie(config-if)# ipv6 route static bfd FastEthernet 0/1 2001:1::2
#S*36#W0 U0
Ruijie(config-if)# ipv6
```



67.1.10 neighbor fall-over bfd

```
router address-family , neighbor fall-over BGP BFD
```

bfd	BFD

10.3(4b3)	

67.1.11 set ip next-hop verify-availability

Route-map **set ip next-hop verify-availability** BFD
 TRACK IP **no**

set ip next-hop verify-availability [*next-hop-address* [**track** number|**bfd** [**vrf** *vrf-name*]
interface-type interface-number gateway]]

no set ip next-hop verify-availability [*next-hop-address* [**track** number|**bfd** [**vrf** *vrf-name*]
interface-type interface-number gateway]]

vrf <i>vrf-name</i>	fl Ł JF:
<i>next-hop-address</i>	fl Ł =D
track <i>y</i>	110.5 0.0006 Tc 6.96 -0.183 Td[<0TT0j/C58403346334E40249<11CD423534

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
```

bfd	BFD
------------	-----

10.3(4b3)	
------------------	--

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]]
```

vrf <i>vrf-name</i>	()	VRF
client	()	
bgp	BGP	BFD
ospf	OSPF	BFD
rip	RIP	BFD
vrrp	VRRP	BFD
static-route	StaticRoute	BFD
pbr	PBR	BFD
ipv4 <i>ip-address</i>	IPv4	
ipv6 <i>ip-address</i>	IPv6	

details

MinTxInt: 200000, MinRxInt: 200000, Multiplier: 5

Received MinRxInt: 50000, Received Multiplier: 3

Holddown (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

--	--

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**

rldp detect-interval	

-	-

68.1.3 rldp enable

RLDP

rldp enable

no rldp enable

--	--

	RLDP	RLDP
	Ruijie(config)# rldp enable	
	rldp port	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 }

unidirection-detect		
bidirection-detect		
loop-detect		
warning		
shutdown-svi	shutdown	svi
shutdown-port	shutdown	
block		

RLDP

RLDP

fas 0/1

rldp

```
Ruijie(config)# interface fas 0/1  
Ruijie(config-if)# rldp port loop-detect block
```

rldp enable	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
age-timer minutes	10 30	10
age-timer infinite	TCP	PTMU

TCP

Foreign Address	“ ” “2002::2.23” “192.168.195.212.23” “23”
PMTU	PMTU
ip tcp path-mtu-discovery	TCP PMTU
10.4	

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

flash:	flash URL flash
tftp:	TFTP
xmodem:	xmodem
slave:	flash
usb0:	usb
usb1:	usb
sd0:	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

```

del	
rename	
dir	

70.1.3 delete

delete url

<i>url</i>	<i>url</i>

|
|

|
|

url

r

1

Ruijie# **dir** slave0:/

Directory of slave:/

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.

pwd	
cd	

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
```

rmdir	
pwd	

|

--	--

70.1.6 rename

rename *url1 url2*

<i>url1</i>		URL
<i>url2</i>		URL

usb0/1, flash, slave

1 log.txt ,4z*ErBNbE4#Q!U_

70.1.7 rmdir

rmdir directory

	<i>directory</i>	,

└──

└──

└──

└──
Ruijie# **rmdir** tmp

	mkdir	

└──

70.2

70.2.1 pwd

pwd



└──

└──

└──

1
Ruijie#show file systems

└──

└──

└──

71

71.1 CPU

71.1.1 cpu-log

CPU	cpu-log
cpu-log <i>log-limit low_num high_num</i>	
<i>log-limit</i>	
<i>low_num</i>	CPU
<i>high_num</i>	CPU
100%	90%
CPU CPU	CPU CPU
,	, CPU

	-	-

	-	-

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%	psnps
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**

show memory	

-

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	memory-lack exit-policy
low	OVERFLOW
high	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
  
```

show memory	

-

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**

logging on	
show logging	
clear logging	

	-	-

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**

	logging on	
	show logging	

	-	-

72.1.5 logging count

no

logging count

no logging count

	-	-

|

|

|

no logging count

|

Ruijie(config)# **logging count**

	show logging count	
	show logging	

|

	-	-

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

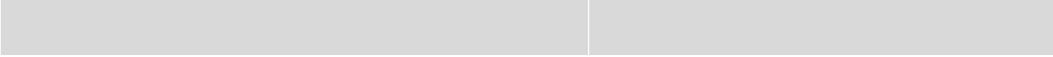
FLASH
FLASH logging file flash

FLASH

VTY

6

Ruijie(config)# **logging monitor informational**



logging	Syslog Server
logging file flash:	FLASH
logging console	
logging monitor	VTY (telnet)
logging trap	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**

show logging count	
show logging	

2 IPV6 AAAA:BBBB::FFFF
Ruijie(config)# **logging server ipv6 AAAA:BBBB::FFFF**

logging on	
show logging	
logging trap	syslog server



	-	-
--	---	---

72.1.14 logging synchronous

no

logging synchronous

no logging synchronous

	-	-

┌
└
┌
└
┌
└

```
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      //
```

	show running-config	

┌
└
┌
└

72.1.15 logging trap

Syslog Server

service sequence-numbers

no service sequence-numbers

	-	-

|

|

|

1

|

Ruijie(config)# **service sequence-numbers**

	logging on	
	service timestamps	

|

	-	-

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

```

show logging	

-	-

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
```

logging on	
service sequence-numbers	

-	-

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	

┌

-	-

72.2.2 show logging count

show logging count

-	-

┌

┌

logging count **lunt** **logging count** **show**
 Q Qd0, œ?U ES*ü 1 « y [4³Au s ú ' Ô¥ K€ Ä

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
```

--	--

	show stack interface	
	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, .

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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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