



**RG-S8600**

**IPv6**

**RGOS 10.3(5)**

©2010





{x|y|...}

[x|y|...]

//

**3.**

/

---

/

1)

2)

3)

---



---

```

aaa-gs          AAA server group mode
acl             acl configure mode
bgp            Configure bgp Protocol
config         globle configure mode

```

\*

*\*command-alias=original-command*

```

EXEC           "s"   "show"           "s?"
's'

```

Ruijie# **s?**

\*s=show show start-chat start-terminal-service

```

EXEC           "sv"   "show version"

```

Ruijie# **s?**

\*s=show \*sv="show version" show start-chat  
start-terminal-service

Ruijie# **s?**

show start-chat start-terminal-service

```

"ia"   "ip address"

```

Ruijie(config-if)# **ia ?**

A.B.C.D IP address

dhcp IP Address via DHCP

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

```

"ip address"

```

### show aliases

```

"def-route"

```

```

"ip route 0.0.0.0 0.0.0.0 192.168.1.1"

```

Ruijie# **configure terminal**

Ruijie(config)# **alias config** def-route ip route 0.0.0.0  
0.0.0.0 192.168.1.1

Ruijie(config)# **def-route?**

\*def-route="ip route 0.0.0.0 0.0.0.0 192.168.1.1"

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

<b>show aliases</b>	

## 1.2 privilege

**privilege** **no**

**privilege** *mode* [**all**] {**level** *level* | **reset**} *command-string*  
**no privilege** *mode* [**all**] [**level** *level*] *command-string*

*mode* CLI

[**all**]

**level** *level* 0-15

**reset**

*command-string*

**privilege**

CLI

**privilege ?**

CLI

<b>config</b>	

<b>exec</b>	
<b>interface</b>	
<b>ip-dhcp-pool</b>	DHCP
<b>keychain</b>	KeyChain
<b>keychain-key</b>	KeyChain-key
<b>time-range</b>	Time-Range

CLI 1 "test" reload

mode

EXEC

EXEC

Ruijie# **show aliases exec**

exec mode alias:

h	help
p	ping
s	show
u	undebug
un	undebug

<b>alias</b>	

---

# 2

## 2.1

CLI

- ' **disable**
- ' **enable**
- ' **enable password**
- ' **enable secret**
- ' **password**
- ' **login**
- ' **login local**
- ' **login authentication**
- ' **username**
- ' **lock**
- ' **lockable**
- ' **telnet**
- ' **ip telnet source-interface**
- ' **enable service**

### 2.1.1 **disable**

disable

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

*privilege-level*

---

/

**disable**

---

Ruijie# **disable 10**

<b>enable</b>	

## 2.1.2 enable

enable

## 2.1.3 enable password

**enable password**

**no**

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

**no enable password**

*Password*

EXEC

*Level*

**0|7**

0

7

*encrypted-password*

---

' 1 26  
'

---

---

password security password  
15 security 0 15  
password  
security 15 password password security  
15 password security password  
security  
pw10

---

<b>enable password</b>	

## 2.1.6 password

```

line
no line
password {password | [0|7] encrypted-password}
no password

```

```

password line
0|7 0 7
encrypted-password

```

line

line

line red

```

Ruijie(config)# line vty 0
Ruijie(config-line)# password red

```

<b>login</b>	

## 2.1.7 login

AAA

---

line

AAA

VTY console

VTY

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

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

Ruijie(config-line)# **password 0 normatest**

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

<b>password</b>	line

## 2.1.8 login local

AAA

**login local no**

**login local**

**no login local**

line

AAA

---

```

Ruijie(config)# no aaa new-model
Ruijie(config)# username test password 0 test
Ruijie(config)# line vty 0
Ruijie(config-line)# login local

```

username	

## 2.1.9 login authentication

AAA

AAA

**no**

**login authentication** {default | *list-name*}

**no login authentication** {default | *list-name*}

**default**

*list-name*

line

AAA

AÈ â

AAA \$;X12Dïax 2`Àradnusthentication

---

## 2.1.10 username

username

**username** *name* {**nopassword** | **password** { *password* | [**0|7**]  
*encrypted-password* }}

**username** *name* **privilege** *privilege-level*

**no username** *name*

*name*

*password*

**0|7**                      0              7

*encrypted-password*

*privilege-level*

---

7

7

7

---

15

Ruijie(config)# **username** *test* **privilege** 15 **password** 0  
*pw15*

<b>login local</b>	

## 2.1.11 lock

---

EXEC

lock

lock

1. lock

2.

Locked

3.

line

lockable

line

```
Ruijie(config-line)# lockable
```

```
Ruijie(config-line)# end
```

```
Ruijie# lock
```

```
Password: <password>
```

```
Again: <password>
```

```
Locked
```

```
Password: <password>
```

```
Ruijie#
```



lockable

Q , È ü,É ð Ç% Â ðÁ€`•@¥ D!ÿQN0=ñf³â





---

<b>telnet</b>	Telnet

## 2.1.15 enable service

SSH Server/Telnet Server/Web Server/Snmp Agent  
**enable service**

```
enable service { ssh-sesrver | telnet-server | web-server | snmp-agent }
```

<b>ssh-sesrver</b>	SSH Server
<b>telnet-server</b>	Telnet Server
<b>web-server</b>	Http Server
<b>snmp-agent</b>	Snmp Agent

**no enable service**

```
enable service ssh-sesrver, SSH Server
Ruijie(Config) # enable service ssh-sesrver
```

<b>show service</b>	

## 2.2

```
' clock set
' clock update-calendar
```

---

```
' exec-timeout
' hostname
' session-timeout
' show clock
' show running-config
' show startup-config
' reload
' show reload
' prompt
' banner motd
' banner login
' speed
' show line
' write
```

## 2.2.1 clock set

### clock set

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

```
hh:mm:ss          24      :      :
day             1-31
month          1-12
year           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	

## 2.2.2 clock update-calendar

clock update-calendar clock privileged EXEC clock  
clock update-calendar clock clock

calendar

clock clock  
Ruijie# clock update-calendar



LINE6.02c 0 Tw 0 Ts 1002.47488.5 <361D0E311FF514E3>.02cd( )TjE488.5 786.02c 0 Tw 0 Ts.0057 10

---

## 2.2.5 session-timeout

LINE  
**session-timeout**                      **no session-timeout**                      LINE

**session-timeout** *minutes* [*seconds*]

**no session-timeout**

*minutes*

*seconds*

0 min

LINE

LINE

LINE

line vty 0                                      5 30 :

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

## 2.2.6 show clock

**show clock**

**show clock** [**detail**]

**detail**

detail

**show clock**

---

```
Ruijie# show clock detail
clock: 2003-3-17 10:27:21
Clock read from calendar when system boot.
```

clock set	

## 2.2.7 show running-config

---

```
month          1  12
day            1  31
year           1993 2035
cancel
```

```
10
```

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

## 2.2.10 show reload

```
reload show
show reload
```

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

## 2.2.11 prompt

```
no prompt prompt
```

---

**prompt** *string*

*string*

32

EXEC

RGOS

Ruijie(config)# **prompt** *RGOS*

Ruijie(config)# **end**

RGOS

## 2.2.12 banner motd

**banner motd**

**no banner motd**

**banner motd** *c message c*

*c*

*message*

Ruijie(config)

Ruijie(config)# **banner motd** \$ *hello,world* \$

## 2.2.13 banner login

---

**banner login**

**no banner login**

**banner login** *c message c*

*c*  
*message*

Ruijie(config)

Ruijie(config)# **banner login** \$ *enter your password* \$

## 2.2.14 speed

**speed speed**

**no speed**

**speed speed**

*Speed* *bps*  
9600 19200 38400 57600 115200  
9600

9600

57600 bps

---

```
Ruijie(config)#  
Ruijie(config)# line console 0  
Ruijie(config-line)# speed 57600  
Ruijie(config-line)#
```

## 2.2.15 show line

### show line

```
show line [console line-num | vty line-num | line-num]
```

#### console

```
vt          vt  
line-num      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
```

## 2.2.16 write

---

**write**

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

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

E

## 3 LINE

### 3.1 LINE

#### 3.1.1 line

LINE

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

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

LINE

LINE VTY 1 3 LINE

Ruijie(config)# **line vty** 1 3

#### 3.1.2 line vty

VTY  
VTY **no**

```

line vty line-number
no line vty line-number
    
```

```

VTY          5          0-4
    
```

```

VTY
    
```

```

VTY          20         VTY          0-19
    
```

```

Ruijie(config)# line vty 19
    
```

```

VTY          10         VTY          0-9
    
```

```

Ruijie(config)# line vty 10
    
```

### 3.1.3 transport input

```

Line
                    transport input
                    default transport input
Line
LINE
    
```

```

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

```

default transport input
    
```

<b>all</b>	Line
<b>ssh</b>	Line SSH
<b>telnet</b>	Line Telnet
<b>none</b>	Line

```

                VTY                                TTY
NONE
  default transport input

```

Line

```

                Line                                VTY
VTY                                show running    Line

```

```

                default transport input    no transport inp
ut                LINE                    transpo
rt input none

```

```

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

```

<b>show running</b>	

RGOS10.1

### 3.1.4 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

---

# 4

## 4.1

	CLI	COPY
' Xmodem		<b>copy xmodem</b>
' Tftp		<b>copy tftp</b>

### 4.1.1 copy xmodem

xmodem

xmodem

**copy flash: filename xmodem**  
**copy xmodem flash: filename**

*filename*

Xmodem

Xmodem

:

xmodem  
xmodem

---

**copy xmodem flash:"filename"**    **copy flash:"filename" xmodem**

---

Ruijie# **copy xmodem flash: config.text**

---

```
Ruijie# copy flash: config.text xmodem
```

## 4.1.2 copy tftp

```
          tftp                                tftp  
copy flash: filename tftp:// location / filename  
copy tftp:// location/filename flash: filename  
copy flash: filename tftp:// location / filename vrf vrfname  
copy tftp:// location/filename flash: filename vrf vrfname  
  
filename  
vrfname vrf
```

```
TFTP                                TFTP
```

---

```
          tftp  
copy tftp://"location/filename" flash:filename vrf vrfname  
  
copy tftp://localtion/filename flash:"filename" vrf vrfname
```

---

```
          ip 192.168.12. 1  
          config.bak      ;                switch.bin  
          ip 192.168.12.1  
  
Ruijie# copy tftp://192.168.12.1/config.bak flash:  
config.text
```

---

```
Ruijie# copy flash: swhich.bin tftp://192.168.12.1/  
config.bak
```

---

# 5

## 5.1

- ' ping
- ' traceroute
- ' line-detect

### 5.1.1 ping

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

<i>vrf-name</i>	VRF
<i>ip-address</i>	IPv4
<i>length</i>	
<i>times</i>	
<b>timeout</b>	
<i>data</i>	
<i>source</i>	IPv4

IP    2    5    100Byte

Ping

ping

ping

---

ping  
2 5 100Byte  
IP !  
.  
ping  
ping  
DNS

<i>ip-address</i>	IPv4
<i>number</i>	
<i>source-address</i>	IPV4
<i>seconds</i>	
<i>minimum maximum</i>	TTL

traceroute

DNS

traceroute

1 traceroute

Ruijie# **traceroute** 61.154.22.36

< press Ctrl+C to break >

Tracing the route to 61.154.22.36

```

1    192.168.12.1    0 msec  0 msec  0 msec
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
Ruijie#

```

```

                                     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

```

### 5.1.3 Line-detect

```
line-detect
```

```
line-detect
```

```
line-detect
```

```
Ruijie(config)#int gigabitEthernet 3/1
Ruijie(config-if)#line-detect
start cable-diagnoses,please wait...
cable-daignoses end!this is result:
4 pairs
pair state      length(meters)
-----
A      Ok           2
B      Ok           1
C      Short        1
D      Short        1
```

pairs	

```
State                OK
```

--	--

```
}
```

---

S8600

M8600\_48GT\_4SFP\_POE\_II

M8600\_48GT\_4SFP\_E

M8600\_48GT\_4SFP\_E\_II

---

# 6

## 6.1

- ' interface aggregateport
- ' interface giagbitEthernet
- ' interface vlan
- ' medium-type
- ' descriptioin
- ' shutdown
- ' speed
- ' duplex
- ' flowcontrol
- ' mtu
- ' carrier-delay
- ' clear counters
- ' clear interface
- ' switchport
- ' switchport mode
- ' switchport access
- ' switchport trunk
- ' snmp trap link-status

### 6.1.1 interface aggregateport

no

**interface aggregateport** *port-number*

*port-number* Aggregate port

port

aggregate port aggregate

---

aggregate port  
interfaces aggregateport

show interfaces show

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

<a href="#">show interfaces</a>	

S8600

---

### 6.1.3 interface vlan

virtual interface SVI switch  
SVI **no**

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

*vlan-id* VLAN ID

**show interfaces**    **show interfaces vlan**

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

<b>show interfaces</b>	

```
S8600  
'                    2K    SVI  
'                    2K    IP
```

### 6.1.4 medium-type

**no** .

**medium-type** { **fiber** | **copper** }  
**no medium-type**

**fiber**  
**copper**

---

Ap SVI

```
Ruijie(config)# interface gigabitethernet 1/1  
Ruijie(config-if)# medium-type copper
```

<b>show interfaces</b>	

```
24SFP/12GT      12  SFP      12  10/100/1000M BASE-T
```

SFP

---

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

<b>show interfaces</b>	

## 6.1.6 shutdown

**no**

**shutdown**  
**no shutdown**

Ap      SVI

**show interfaces**

Ap 1

```
Ruijie(config)# interface aggregateport 1
Ruijie(config-if)# shutdown
```

Ap 1

```
Ruijie(config)# interface aggregateport 1
Ruijie(config-if)# no shutdown
```

<b>clear interface</b>	
<b>show interfaces</b>	

---

/

---

no shutdown

---

### 6.1.7 speed

no

<b>10</b>	10Mbps
<b>100</b>	100Mbps
<b>1000</b>	1000Mbps
<b>10G</b>	10Gbps
<b>auto</b>	

Ap	Ap
<b>show interfaces</b>	Ap
SFP	10M 100M

```
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# speed 100
```

<b>show interfaces</b>	

### 6.1.8 duplex

no

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

**no duplex**

---

**auto**  
**full**  
**half**

**show interfaces**

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

<b>show interfaces</b>	

### 6.1.9 flowcontrol

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
```

<b>show interfaces</b>	

### 6.1.10 mtu

mtu

**Mtu num**

```
num 64 9216( 65536 )
```

1500

mtu

```
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# mtu 9216
```

<b>show interfaces</b>	

### 6.1.11 carrier-delay

**carrier-delay**

**no**

---

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

**no carrier-delay**

*seconds*

1 60

2

DCD Down Up

---

```
Ruijie# clear counters gigabitethernet 1/1
```



```
show interfaces
```



---

switch port trunk VLAN  
VLAN VLAN VLAN trunk port  
VLAN VLAN **switchport trunk**

Ruijie(config-if)# **switchport mode trunk**

?



---

```

VLAN    VLAN ID    Trunk    native VLAN
  1      1            UNTAG
VLAN
Trunk VLAN 14094
Trunk VLAN VLAN

```

switchport

1/15

```

interface fastethernet 1/15
switchport trunk allowed vlan remove
end
interfaces fastethernet1/15 switchport
led
native vlan is 1
led

```

	<b>show interfaces</b>	
	<b>switchport access</b>	statics accessport VLAN

### 6.1.18 snmp trap link-status

```

Link      SNMP      LinkTrap
no
LinkTrap,

```

---

LinkTrap                    Ap            SVI                    Link                    SNMP  
LinkTrap,

Link trap

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

Link trap

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

---

```

Ruijie# show interfacesgigabitEthernet 0/1 switchport
Interface Switchport ModeAccess Native Protected VLAN
lists
-----
GigabitEthernet 0/1 enabled Access 11 Disabled ALL

```

<b>duplex</b>	
<b>flowcontrol</b>	
<b>interface gigabitEthernet</b>	
<b>interface aggregateport</b>	
<b>interface vlan</b>	switch virtual interface SVI
<b>shutdown</b>	
<b>speed</b>	
<b>switchport priority</b>	802.1q
<b>switchport protected</b>	

# 7 Aggregate Port

## 7.1

### 7.1.1 port-group

```
Aggregate Port
Aggregate Port no
```

```
port-group port-group-number
no port-group
```

Aggregate Port

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

S8600

```
' 8
' 128 AP
```

### 7.1.2 aggregateport load-balance

AP

no

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

**no aggregateport load-balance**

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

MAC

**show aggregateport load-balance**

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

--	--

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

S8600

## 7.2

### 7.2.1 show aggregateport

aggregateport

**show aggregateport** {[*aggregate-port-number*] **summary** |  
**load-balance**}

<i>aggregate-port-number</i>	Aggregate Port
<b>load-balance</b>	aggeregaye port
<b>summary</b>	aggregate port

aggregate port

aggregate port

```
Ruijie# show aggregateport 1 summary
AggregatePort  MaxPorts      SwitchPort Mode  Ports
-----
Ag1              8              Enabled  ACCESS
```

--	--

# 8 LACP

## 8.1

### 8.1.1 lacp port-priority

LACP

no

**lacp port-priority** *port-priority*

**no lacp port-priority**

	<i>port-priority</i>	0-65535

32768

” ‘ ‘

## 8.1.2 port-group mode

LACP ID no  
LACP

**port-group key mode active | passive**

**no port-group**

<i>Key</i>	ID, key
<b>active</b>	LACP
<b>passive</b>	LACP LACP LACP .

LACP

```
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# port-group 1 mode active
```

--	--

**lacp port-priority**

<i>port-priority</i>	0-65535

32768

”

```
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# lacp port-priority 4096
```

<b>port-group</b> <i>key mode active   passive</i>	LACP ID
<b>port-group</b> <i>key mode</i>	

-	-

### 8.1.4 lacp system-priority


LACP no

**lacp system-priority** *system-priority*

**no lacp system-priority**

<i>system-priority</i>	LACP 0-65535

```
Ruijie(config)# lacp system-priority 4096
```



Local information:

Port	Flags	LACP port State	Priority	Oper Key	Port Number	Port State
Gi0/1	SA	bndl	4096	0x3	0x1	0x3d
Gi0/2	SA	bndl	4096	0x3	0x2	0x3d
Gi0/3	SA	bndl	4096	0x3	0x3	0x3d

Partner information:

Port	Flags	LACP port Priority	Dev ID	Oper Key	Port Number	Port State
Gi0/1	SA	61440	00d0.f800.0002	0x3	0x1	0x3d
Gi0/2	SA	61440	00d0.f800.0002	0x3	0x2	0x3d
Gi0/3	SA	61440	00d0.f800.0002	0x3	0x3	0x3d

Local information		LACP				
Port		ID				
Flags		S' LACP LACPPDU				
State		'A' bndl Down				
		sup				



# 9 VLAN

## 9.1

### 9.1.1 vlan

```

VLAN
VLAN
vlan vlan-id
no vlan vlan-id
    
```

<i>vlan-id</i>	VLAN ID VLAN VLAN 1

```

end          Ctrl+C
exit
    
```

```

Ruijie(config)# vlan 1
Ruijie(config-vlan)#
    
```

<b>show vlan</b>	VLAN

```

S8600          4093  vlan
    
```

### 9.1.2 name

VLAN **no**

**name** *vlan-name*

**no name**

<i>vlan-name</i>	VLAN

VLAN

VLAN

**show vlan** **vlan**

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

<b>show vlan</b>	VLAN

### 9.1.3 switchport mode

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

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

**no switchport mode**

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

switch port **access**

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

switch port trunk VLAN  
 VLAN VLAN VLAN trunk port  
 VLAN  
**switchport trunk**

Ruijie(config-if)# **switchport mode trunk**

<b>switchport access</b>	statics accessport VLAN
<b>switchport trunk</b>	trunkport native VLAN Trunk VLAN

### 9.1.4 switchport access

access port VLAN  
**no** VLAN

**switchport access vlan** *vlan-id*  
**no switchport access vlan**

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

switch port access VLAN VLAN 1

```

          VLAN ID          VLAN ID
    VLAN
VLAN ID      VLAN
              trunkport
    
```

```

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

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

### 9.1.5 switchport trunk

```

trunkport native VLAN Trunk VLAN
no trunk
    
```

```

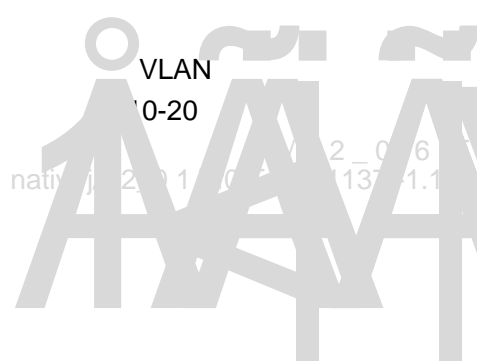
switchport trunk {allowed vlan { all | [add | remove | except]
vlan-list }| native vlan vlan-id}
no switchport trunk {allowed vlan | native vlan }
    
```

--	--

```

          Trunk      VLAN
vlan-list      VLAN
VLAN          VLAN ID
ID            -
    
```

**allowed vlan** *vlan-list*



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
Switchport is enabled
Mode is trunk port
Access vlan is 1,Native vlan is 1
Protected is disabled
Vlan lists is
1,3-4094
```

<b>show interfaces</b>	
<b>switchport access</b>	statics accessport VLAN

**9.2**

## 9.2.1 show vlan

VLAN

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

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

**end**

**Ctrl+C**

**exit**

```
Ruijie# show vlan id 1
VLAN[1] "VLAN0001"
GigabitEthernet 3/1
GigabitEthernet 3/2
GigabitEthernet 3/3
GigabitEthernet 3/4
GigabitEthernet 3/5
GigabitEthernet 3/6
GigabitEthernet 3/7
GigabitEthernet 3/8
GigabitEthernet 3/9
GigabitEthernet 3/10
GigabitEthernet 3/11
GigabitEthernet 3/12
```

<b>name</b>	VLAN
<b>switchport access</b>	Vlan

# 10 Super-vlan

## 10.1

### 10.1.1 supervlan

VLAN      **supervlan**

**supervlan**

**no supervlan**

VLAN

**end**

**Ctrl+C** ¾



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

VLAN

**no subvlan**      **supevlan**      **subvlan**

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

<b>show supervlan</b>	supervlan

### 10.1.3 subvlan-address-range

subvlan ip

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

**no subvlan-address-range**

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

VLAN

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

**exit**

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

<b>show supervlan</b>	supervlan

### 10.1.4 proxy-arp

VLAN ARP

```
proxy-arp
no proxy-arp
```

VLAN

```
end                   Ctrl+C
exit
```

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

<b>show supervlan</b>	supervlan

## 10.2

### 10.2.1 show supervlan

SuperVLAN      SubVLAN

**show supervlan**

**show supervlan id *vlan-id***

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

Ruijie# **show supervlan**

```
supervlan id supervlan arp-proxy subvlan id subvlan
arp-proxy subvlan ip range
```

```
-----
```

3	ON	4	ON
		5	ON

# 11 Protocol VLAN

## 11.1

- ' **protocol-vlan ipv4** *addr mask addr* **vlan** *id*
- ' **protocol-vlan profile** *num* **frame-type** [*type*] **ether-type** [*type*]
- ' **protocol-vlan profile** *num* **vlan** *id*

### 11.1.1 protocol-vlan ipv4 addr mask addr vlan id

	IP		VLAN
<i>addr</i>	IP		x.x.x.x
<i>id</i>	VLAN ID	1-	VLAN

```
Ruijie(config)# protocol-vlan ipv4 192.168.100.3 mask  
255. 255.255.0 vlan 100
```

```
show protocol-vlan ipv4
```

```
no protocol-vlan ipv4 addr mask addr
```

```
no protocol-vlan ipv4
```

```
RGOS10.1
```

### 11.1.2 protocol-vlan profile num frame-type type ether-type

**type**

profile

*num* profile  
*type*

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

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

RGOS10.1

### 11.1.3 protocol-vlan profile num vlan id

profile

*num* profile  
*id* VLAN ID 1- VLAN

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

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

**no protocol-vlan profile *num***

RGOS10.1

## **11.2**

**show protocol-vlan**

### **11.2.1 show protocol-vlan**

Protocol VLAN

**show vlan protocol-vlan**

Ruijie# **show protocol-vlan**

RGOS10.1

# 12 PrivateVLAN

## 12.1

- ' **private-vlan type**
- ' **private-vlan association**
- ' **private-vlan mapping**
- ' **switchport mode private-vlan**
- ' **switchport private-vlan host-association**
- ' **switchport private-vlan mapping**

### 12.1.1 private-vlan type

VLAN VLAN

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

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

*community* community VLAN

*isolated* isolated VLAN

*primary* primary VLAN

*no* VLAN

VLAN

```
Ruijie(config)# vlan 22
```

```
Ruijie(config-vlan)# private-vlan primary
```

**show vlan private-vlan**

RGOS10.1



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

```
show vlan private-vlan
```

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

*p\_vid*                primary VID  
*s\_vid*                secondary VID  
**no :**                VLAN

```
Ruijie(config)# interface gigabitEthernet 0/1  
Ruijie(config-if)# switchport mode private-vlan host  
Ruijie(config-if)# switchport private-vlan host-association 22 23
```

### **show vlan private-vlan**

RGOS10.1

## **12.1.6 switchport private-vlan association trunk**

private VLAN            trunk                    primary VLAN  
secondary VLAN

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

**no switchport private-vlan association trunk *p\_vid s\_vid***

*p\_vid*                primary VID  
*s\_vid*                secondary VID  
**no :**                VLAN

```
Ruijie(config)# interface gigabitEthernet 0/1  
Ruijie(config-if)# switchport mode trunk
```

```
Ruijie(config-if)# switchport private-vlan associatio  
n trunk 22 23
```

```
show vlan private-vlan
```

RGOS10.3(5)

## 12.1.7 switchport private-vlan mapping

```
private VLAN                                secondary VLAN  
switchport private-vlan mapping p_vid {svlist}add svist |remove  
svlist}  
no switchport private-vlan mapping
```

<i>p_vid</i>	primary VID
<i>svlist</i>	secondary VLAN list
<b>no</b>	secondaryVLAN

VLAN

```
Ruijie(config)# interface gigabitEthernet 0/1  
Ruijie(config-if)# switchport mode private-vlan  
promiscuous  
Ruijie(config-if)# switchport private-vlan mapping 22  
add 23-25
```

```
show vlan private-vlan
```

RGOS10.1

## 12.2

Private VLAN

```
Ruijie(config-if)# switchport mode hybrid
```

RGOS10.1

### **12.3.2 switchport hybrid native vlan**

```
switchport hybrid native vlan vid
```

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

RGOS10.1

# 13 802.1Q Tunneling

## 13.1

```
' switchport mode dot1q-tunnel
' switchport mode uplink
' switchport dot1q-tunnel allowed vlan
' switchport dot1q-tunnel native vlan
' dot1q outer-vid
' dot1q relay-vid
' traffic-redirect access-group acl outer-vlan
' traffic-redirect access-group acl inner-vlan
' traffic-redirect access-group acl nested-vlan
' frame-tag tpid tpid
' inner-priority-trust enable
' l2protocol-tunnel
' l2protocol-tunnel proto-type enable
```

### 13.1.1 switchport mode dot1q-tunnel

802.1Q tunneling

```
switchport mode dot1q-tunnel
no switchport mode
```

```
no 802.1Q tunneling
```

802.1Q tunneling

dot1q-tunnel

```
ruijie(config)#interface gigabitEthernet 0/1
ruijie(config-if)#switchport mode dot1q-tunnel
ruijie(config)#end
```

**show vlan**

RGOS10.1

### 13.1.2 switchport mode uplink

uplink

**switchport mode uplink**

**no switchport mode**

**no** uplink

uplink

uplink

```
ruijie(config)#interface gigabitEthernet 0/1
ruijie(config-if)#switchport mode uplink
ruijie(config)#end
```

**show vlan**

RGOS10.1

### 13.1.3 switchport dot1q-tunnel allowed vlan

dot1q-tunnel vlan

**switchport dot1q-tunnel allowed vlan [add] {tagged|untagged}**  
*v\_list*

**switchport dot1q-tunnel allowed vlan remove** *v\_list*

**no switchport dot1q-tunnel allowed vlan**

```
tagged : tag
untagged : tag
v_list : vlan id
no
```

```
vlan 1 untagged
```

```
dot1q-tunnel vlan 3-6 vlan tag
ruijie(config)#interface gigabitEthernet 0/1
ruijie(config-if)#dot1q-tunnel allowed vlan
tagged 3-6
ruijie(config)#end
```

### show interface dot1q-tunnel

RGOS10.3

## 13.1.4

```
dot1q-tunnel vlan id
sw4tchport dot1q-tunnel native vlan vid
no sw4tchport dot1q-tunnel native vlan

vid vlan id
no vlan 1

vlan 1
```

```
dot1q-tunnel          vid 8
```

```
ruijie(config)#interface gigabitEthernet 0/1
ruijie(config-if)#switchport dot1q-tunnel native vlan
8
ruijie(config)#end
```

```
show interface dot1q-tunnel
```

```
RGOS10.3
```

### 13.1.5 dot1q outer-vid

```
tunnel                vid
```

```
dot1q outer-vid vid register inner-vid v_list
```

```
no dot1q outer-vid vider inner-vid v_list
```

```
vidTj/C
ruijie(con
```

RGOS10.3

### 13.1.6 dot1q relay-vid

access trunk hybrid vid

**dot1q relay-vid** *vid* **translate local-vid** *v-list*

**no dot1q relay-vid** *vid* **translate local-vid** *v-list*

*v\_list* vid

*vid* tag vid

**no**

tag

```
vid vid
no vid

1.1.1.1 vid 3

Ruijie#configure
Ruijie(config)#ip access-list standard 2
Ruijie(config-std-nacl)#permit host 1.1.1.1
Ruijie(config-std-nacl)#exit
Ruijie(config)# interface gigabitEthernet 0/1
Ruijie(config-if)# switchport mode trunk
Ruijie(config-if)# traffic-redirect access-group 2
outer-vlan 3 in
Ruijie(config-if)# end
```

```
show traffic-redirect
```

RGOS10.3

### 13.1.8 traffic-redirect access-group acl inner-vlan

```
access trunk hybrid vid

traffic-redirect access-group acl inner-vlan vid out
no traffic-redirect access-group acl inner-vlan

acl acl
vid vid
no vid
```

1.1.1.2 vid 6

```
Ruijie#configure
Ruijie(config)#ip access-list standard to_6
Ruijie(config-std-nacl)#permit host 1.1.1.2
Ruijie(config-std-nacl)#exit
Ruijie(config)# interface gigabitEthernet 0/1
Ruijie(config-if)# switchport mode trunk
Ruijie(config-if)# traffic-redirect access-group to_6
inner-vlan 6 out
Ruijie(config-if)# end
```

**show traffic-redirect**

RGOS10.3

### 13.1.9 traffic-redirect access-group acl nested-vlan

dot1q-tunnel vid

```
traffic-redirect access-group acl nested-vlan vid in
no traffic-redirect access-group acl nested -vlan
```

*acl* acl

*vid* vid

**no** vid

1.1.1.3 vid 9

```
ruijie#configure
ruijie(config)#ip access-list standard 20
ruijie(config-std-nacl)#permit host 1.1.1.3
```

```
ruijie(config-std-nacl)#exit
ruijie(config)# interface gigabitEthernet 0/1
ruijie(config-if)# switchport mode dot1q-tunnel
ruijie(config-if)# traffic-redirect access-group 20
nested-vlan 10 in
ruijie(config-if)# end
```

**show traffic-redirect**

RGOS10.1

### **13.1.10 frame-tag tpid tpid**

tpid

```

/
tag tag
inner-priority-trust enable
no inner-priority-trust enable

no tag tag

```

```

tag tag

ruijie#configure
ruijie(config)# interface gigabitEthernet 0/2
ruijie(config-if)# inner-priority-trust enable
ruijie(config-if)#end

```

```
show inner-priority-trust
```

```
RGOS10.1
```

### 13.1.12 l2protocol-tunnel

```

dot1q-tunnel

l2protocol-tunnel {stp|gvrp}
no l2protocol-tunnel {stp|gvrp}

```

```
ruijie(config)#end
```

```
show l2protocol-tunnel {gvrp|stp}
```

RGOS10.3

### 13.1.13 l2protocol-tunnel *proto-type* enable

```
l2protocol-tunnel {stp|gvrp} enable  
no l2protocol-tunnel {stp|gvrp} enable
```

```
stp      stp  
gvrp     gvrp  
no
```

```
ruijie#configure  
ruijie(config)# interface fa 0/1  
ruijie(config-if)# l2protocol-tunnel gvrp enable  
ruijie(config-if)#end
```

```
show l2protocol-tunnel {gvrp|stp}
```

RGOS10.3

## 13.2

```
' show dot1q-tunnel  
' show interface dot1q-tunnel  
' show frame-tag tpid  
' show inner-priority-trust  
' show registration-table
```

- ' **show translation-table**
- ' **show traffic-redirect**
- ' **show l2protocol-tunnel**

### **13.2.1 show dot1q-tunnel**

dot1q-tunnel

**show dot1q-tunnel** [**interface** *intf-id*]

*intf-id*

ruijie#

```
ruijie# show interface dot1q-tunnel
Interface: Gi0/3
Native vlan: 10
Allowed vlan list: 4-6 10 30-60
Tagged vlan list: 4 6 30-60
```

RGOS10.3

### 13.2.3 show frame-tag tpid

tpid

**show frame-tag tpid** [interface *intf-id*]

*intf-id*

tpid

```
ruijie# show frame-tag tpid
Ports  tpid
-----
Gi0/1  0x9100
```

RGOS10.1

```
ruijie# show inner-priority-trust
Ports    inner-priority-trust
-----  -
Gi0/1    enable
```

RGOS10.1

### 13.2.5 show registration-table

dot1q-tunnel vid

**show registration-table** [interface *intf-id*]

*intf-id*

```
ruijie# show registration-table
Ports          Outer-VID  Inner-VID-list
-----
Gi0/7          5          7-10,15,20-30
```

RGOS10.3

### 13.2.6 show translation-table

access,trunk,hybrid vid

**show translation-table** [interface *intf-id*]

*intf-id*

```
ruijie# show translation-table
Ports          Relay-VID  Local-VID-list
-----
Gi0/8          10         8-9,15,20-30
```

RGOS10.3

### 13.2.7 show traffic-redirect

vid

**show traffic-redirect [interface *intf-id*]***intf-id*

```
ruijie# show traffic-redirect
Ports          Type          VID  Match-filter
-----
Gi0/3          Mod-outer    23   11
Gi0/3          Mod-outer    3     4
Gi0/3          Mod-outer    6     5
Gi0/3          Mod-inner    8    inner-to-8
Gi0/6          Mod-inner    9    100
Gi0/7          Nested-vid   13   nest-13
```

RGOS10.3

### 13.2.8 show l2protocol-tunnel

**show l2protocol-tunnel{gvrp|stp}**

**gvrp**                    gvrp

**stp**                     stp

```
ruijie# show l2protocol-tunnel stp  
L2protocol-tunnel: Stp Enable  
ruijie# show l2protocol-tunnel gvrp  
L2protocol-tunnel: gvrp Disable
```

RGOS10.3

# 14 MAC

## 14.1

```
' mac-address-table aging-time
' clear mac-address-table dynamic
' clear mac-address-table filtering
' clear mac-address-table static
' mac-address-table static
' mac-address-table filtering
' mac-address-table notification
' nmp trap mac-notification
' address-bind
' address-bind ip-address
' address-bind uplink
' address-bind install
' address-bind ipv6-mode
' mac-manage-learning uniform
' mac-manage-learning uniform learning-synchronization
' mac-manage-learning dispersive
```

### 14.1.1 mac-address-table aging-time

no

**mac-address-table aging-time** *seconds*

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

*seconds*

300

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

**show mac-address-table dynamic**

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

---

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

### 14.1.2 clear mac-address-table dynamic

**clear mac-address-table dynamic**[address *mac-addr*] [**interface**  
*interface-id*] [**vlan** *vlan-id*]



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

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

**show mac-address-table static**

MAC 00d0.f800.073c

Ruijie# **clear mac-address-table static address**  
*00d0.f800.073c*

VLAN  
MAC

VLAN

VLAN1

160

```
Ruijie#configure terminal
```

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

```
Ruijie(config)#vlan 1
```

```
Ruijie(config-vlan)#max-dynamic-mac-count 160
```



```

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

```

```

00d0.f800.073c VLAN 4

```

```

gigabitethernet 1/1

```

```

Ruijie(config)# mac-address-table static
00d0.f800.073c vlan 4 interface gigabitethernet 1/1

```

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

S8600

```

'   MAC           16K
'           MAC     1K

```

### 14.1.7 mac-address-table filtering

**no**

**mac-address-table filtering** *mac-address* **vlan** *vlan-id*

**no mac-address-table filtering** *mac-address* **vlan** *vlan-id*

<i>mac-address</i>	
<b>vlan</b> <i>vlan-id</i>	VLAN ID

**show mac-address-table filtering**

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



```

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

```

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

<b>snmp-server enable traps</b>	trap
<b>show mac-address-table notification</b>	MAC
<b>snmp trap mac-notification</b>	MAC

### 14.1.9 snmp trap mac-notification

```

MAC
no
snmp trap mac-notification {added | removed}
no snmp trap mac-notification {added | removed}
    
```

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

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

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

### 14.1.10 address-bind ip-address

ip mac .

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

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



fa 0/1

```
Ruijie(config)# address-bind uplink fa0/1
Ruijie(config)# address-bind install
```

show address-bind uplink	

RGOS10.1

### 14.1.13 address-bind ipv6-mode

ip IP

**address-bind ipv6-mode compatible**

**address-bind ipv6-mode loose**

**address-bind ipv6-mode strict**

	<b>Ipv4</b>	<b>IPV6</b>
--	-------------	-------------

	IPV4+MAC	ipv6
	IPV4+MAC	IPV6
	IPV4+MAC	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
```

### 14.1.14 mac-manage-learning uniform

MAC uniform .

MAC uniform  
MAC  
MAC

<b>show mac-address-table</b> <b>mac-manage-learning</b>	MAC

### 14.1.15 mac-manage-learning uniform learning-synchronization

uniform MAC .  
**no mac-manage-learning uniform learning-synchronization**

uniform no MAC MAC

<b>show mac-address-table mac-manage-learning</b>	MAC

### 14.1.16 mac-manage-learning dispersive

MAC dispersive .

MAC dispersive  
 MAC



```
Ruijie# show mac-address-table address 00d0.f800.1001
Vlan      MAC Address      Type      Interface
-----  -
1         00d0.f800.1001  STATIC   Gi1/1
```

show mac-address-table static	
show mac-address-table filtering	
show mac-address-table dynamic	
show mac-address-table interface	
show mac-address-table vlan	VLAN
show mac-address-table count	
show mac-address-table static	
show mac-address-table filtering	

### 14.2.2 show mac-address-table aging-time

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

```
Ruijie# show mac-address-table aging-time
Aging time      : 300
```

mac-address-table aging-time	

### 14.2.3 show mac-address-table count

**show mac-address-table count**

```
Ruijie# show mac-address-table count
Dynamic Address Count : 51
Static Address Count : 0
Filter Address Count : 0
Total Mac Addresses : 51
Total Mac Address Space Available: 8139
```

<b>show mac-address-table static</b>	
<b>show mac-address-table filtering</b>	
<b>show mac-address-table dynamic</b>	
<b>show mac-address-table address</b>	
<b>show mac-address-table interface</b>	
<b>show mac-address-table vlan</b>	VLAN

**14.2.4 show mac-address-table dynamic**

```
show mac-address-table dynamic [address 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 dynamic
```

Vlan	MAC Address	Type	Interface
1	0000.0000.0001	DYNAMIC	gigabitethernet 1/1
1	0001.960c.a740	DYNAMIC	gigabitethernet 1/1
1	0007.95c7.dff9	DYNAMIC	gigabitethernet 1/1
1	0007.95cf.eee0	DYNAMIC	gigabitethernet 1/1
1	0007.95cf.f41f	DYNAMIC	gigabitethernet 1/1
1	0009.b715.d400	DYNAMIC	gigabitethernet 1/1
1	0050.bade.63c4	DYNAMIC	gigabitethernet 1/1

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

## 14.2.5 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

MAC

## **14.2.7 show mac-address-table notification**

## 14.2.8 show mac-address-table static

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

MAC

---

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

3.3.3.4 00d0.f811.1117

<b>address-bind</b>	

## 14.2.11 show mac-address-table mac-manage-learning

MAC

```
Ruijie# show mac-address-table mac-manage-learning
#####MAC manage-learning
running mode: uniform
configuration mode: uniform
dynamic address learning-synchronization: off.
```

<b>mac-manage-learning uniform</b>	MAC uniform
<b>mac-manage-learning uniform learning-synchronization</b>	MAC
<b>mac-manage-learning dispersive</b>	MAC dispersive

# 15 DHCP Snooping

## 15.1 DHCP snooping

DHCP snooping

- ' **ip dhcp snooping**
- ' **ip dhcp snooping vlan**
- ' **ip dhcp snooping bootp-bind**
- ' **ip dhcp snooping verify mac-address**
- ' **ip dhcp snooping information option**
- ' **ip dhcp snooping database write-delay**
- ' **ip dhcp snooping database write-to-flash**

### 15.1.1 ip dhcp snooping

```
DHCP Snooping
no
DHCP Snooping
[no] ip dhcp snooping
```

```
DHCP Snooping          show ip dhcp snooping
DHCP snooping
```

---

```
DHCP Snooping Private VLAN
```

---

```
DHCP snooping
```



```
Ruijie(config)# ip dhcp snooping vlan 1000
Ruijie(config)# end
```

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

### 15.1.3 ip dhcp snooping bootp-bind

```

DHCP Snooping      Bootp
                   no          DHCP snooping      Bootp

```

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

```

DHCP Snooping      Bootp
DHCP Snooping      Bootp          Bootp
DHCP Snooping      Bootp

```

```
DHCP Snooping      Bootp
```

```

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

```

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

### 15.1.4 ip dhcp snooping verify mac-address

MAC  
no                   MAC

**[no] ip dhcp snooping verify mac-address**

MAC                                   DHCP CLIENT  
MAC                   DHCP           CLIENT MAC  
MAC

DHCP           MAC

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

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

### 15.1.5 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 snooping Support Bootp bind status: ENABLE
Interface          Trusted      Rate limit (pps)
-----
    
```

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

### 15.1.6 ip dhcp snooping database write-delay

```

              DHCP Snooping
FLASH          no
              FLASH
' ip dhcp snooping database write-delay time
' [no] ip dhcp snooping database write-delay
time          DHCP snooping          FLASH
    
```



DHCP

**[no] ip dhcp snooping trust**

UNTRUST

	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 ijie(co
```

DHCP Snooping      VLAN  
                    CPP[CPU Protect Protocol]      CPP  
DHCP                      CPP                      DHCP  
Snooping                  CPP

**show ip dhcp snooping**

S86                      DHCP

1                      100pps

Ruijie# **configure terminal**

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

Ruijie(config-if)# **ip 62.70.134.1 / 24**  
**arp 62.70.134.1 0200691**

**show ip dhcp snooping binding**

### 15.3.1 show ip dhcp snooping

DHCP Snooping

**show ip dhcp snooping**

DHCP Snooping

DHCP Snooping

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

<b>ip dhcp snooping</b>	DHCP snooping
<b>ip dhcp snooping verify mac-address</b>	DHCP snooping mac
<b>ip dhcp snooping write-delay</b>	flash
<b>ip dhcp snooping information option</b>	DHCP option82
<b>ip dhcp snooping bootp-bind</b>	DHCP Snooping Bootp
<b>ip dhcp snooping trust</b>	DHCP snooping trust



DHCP snooping

```
Ruijie# clear ip dhcp snooping binding
Ruijie# show ip dhcp snooping binding
Total number of bindings: 0
MacAddress IpAddress Lease(sec) Type VLAN Interface
-----
```

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

### 15.4.2 debug ip dhcp snooping

DHCP Snooping

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

DHCP snooping

DHCP snooping

```
Ruijie# debug ip dhcp snooping event
Ruijie# debug ip dhcp snooping packet
```

# 16 IGMP Snooping

## 16.1

```

IGMP Snooping    profile
Profile
'   range
'   deny
'   permit

'   ip igmp profile
'   ip igmp snooping ivgl
'   ip igmp snooping svgl
'   ip igmp snooping svgl profile
'   ip igmp snooping ivgl-svgl
'   ip igmp snooping vlan
'   ip igmp snooping dyn-mr-aging-time
'   ip igmp snooping query-max-response-time
'   ip igmp snooping vlan mrouter learn pim-dvmrp
'   ip igmp snooping vlan mrouter interface
'   ip igmp snooping vlan static interface
'   ip igmp snooping fast-leave enable
'   ip igmp snooping suppression enable
'   ip igmp snooping source-check port
'   ip igmp snooping source-check default-server
'   ip igmp snooping limit-ipmc vlan server
'   ip igmp snooping filter
'   ip igmp snooping max-groups

```

### 16.1.1 ip igmp profile

```

IGMP    profile
profile-number    profile
                igmp profile
ip igmp profile profile-number

```

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

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

IGMP Profiles

SVGL

IGMP Filtering

profile

profile

1 profile

profile

Ruijie(config)# **ip igmp profile 1**

Ruijie(config-profile)#

<b>range</b>	profile

### 16.1.2 range

profile

profile

profile

range

no

**range** *low-ip-address* [*high-ip-address*]

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

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

profile

low-ip-address                      high-ip-address  
    profile                      deny

233.3.3.3    234.4.4.4                      profile                      :

Ruijie(config)# **ip igmp profile 1**

Ruijie(config-profile)# **range 233.3.3.3 234.4.4.4**

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

### 16.1.3 deny

profile    profile

deny

**deny**

profile                      deny

profile

profile                      range

233.3.3.3    profile                      :



### 16.1.5 ip igmp snooping ivgl

```

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

ip igmp snooping ivgl
no ip igmp snooping
    
```

disable

```

                VLAN
            VLAN
        VLAN          VLAN

                igmp snooping    ivgl
    
```

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

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

### 16.1.6 ip igmp snooping svgl

```

    igmp snooping          SVGL          ip
igmp snooping svgl    no ip igmp snooping    igmp snooping

ip igmp snooping svgl
no ip igmp snooping
    
```





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

```
disable
```

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

```
/
IVGL # SVGL # VLAN @
VLAN          profile
```

```
0% 1/2 ZC @ N @ M T B - S V G I 0.6
```

VLAN                      igmp snooping  
**ip igmp snooping vlan**

<i>num</i>	1-3600

300s

PIM Hello

IGMP

500s

Ruijie(config)# **ip igmp snooping dyn-mr-aging-time 500**

### 16.1.11 ip igmp snooping query-max-response-time

**ip igmp snooping query-max-response-time** IGMP  
**no ip igmp snooping query-max-response-time**

**ip igmp snooping query-max-response-time** *num*  
**no ip igmp snooping query-max-response-time**

<i>num</i>	IGMP 1-65535

10s

IGMP

0

Snooping  
 IGMP  
 IGMP  
 0

IGMP Snooping  
 IGMPv3  
 IGMP 15s

```
Ruijie(config)# ip igmp snooping
query-max-response-time 15
```

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

```
PIM IGMP Query DVMRP Probe ip igmp
snooping vlan mrouter learn pim-dvmrp no
```

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

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

<i>vid</i>	VLAN IGMP Snooping VLAN ID

VLAN  
 VLAN no

igmp

snooping

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

<b>ip igmp snooping vlan mrouter interface</b>	

### 16.1.13 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>	

IP

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


### 16.1.14 ip igmp snooping vlan static interface

```
igmp snooping
IGMP report
ip igmp snooping vlan static interface no

ip igmp snooping vlan vid static address interface interface-id
no ip igmp snooping vlan vid static address interface interface-id
```


vlan1 224.3.3.3

```
Ruijie(config)# ip igmp snooping vlan static 224.3.3.3
interface fastEthernet 0/1
```

QaadWRQ

--	--

<b>ip igmp snooping vlan mrouter interface</b>	
--	--

### 16.1.15 ip igmp snooping fast-leave enable

igmp snooping fast-leave  
**snooping fast-leave enable**

no

**ip igmp**  
igmp snooping]TJEi[ ip <1FF5747



IGMP SNOOPING

IGMP

IGMP Sooping  
IGMP SNOOPING

VLAN

igmp snooping

Ruijie(config)# **ip igmp snooping source-check port**

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

### 16.1.18 ip igmp snooping source-check default-server

IP IP  
igmp snooping IP  
**ip igmp snooping source-check default-server** no  
IP  
**ip igmp snooping source-check default-server** *address*  
**no ip igmp snooping souce-check**

<i>address</i>	



IP

```
Ruijie(config)# ip igmp snooping limit-ipmc vlan
```

ip igmp profile	profile

### 16.1.21 ip igmp snooping max-groups

ip

**debug igmp-snp**

### 16.2.1 show ip igmp snooping

igmp snooping

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

	igmp snooping
<b>gda-table</b>	
<b>interfaces</b>	filter max-group
<b>mrouter</b>	
<b>statistics</b>	snooping

EXEC

fa0/1 100

Ruijie(config-if)# **ip igmp snooping gda-table**

Abbr:M - mrouter

D - dynamic

S - static

VLAN	Address	Member ports
-----		-----
1	233.3.3.3	Gi0/2(S)
2	234.4.4.4	Gi0/11(S)
1	233.4.4.4	Ag2(S)

## 16.2.2 show ip igmp profile

profile

**show ip igmp profile**

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

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

EXEC

profile

fa0/1 100

Ruijie(config-if)#**show ip igmp profile**

Profile 1

Permit

range 224.0.1.0, 239.255.255.255

## 16.2.3 clear ip igmp snooping gda-table

EXEC

Ruijie# **clear ip igmp snooping gda-table**

## 16.2.4 clear ip igmp snooping statistics

EXEC

Ruijie# **clear ip igmp snooping gda-table**

## 16.2.5 debug igmp-snp

igmp

no

**debug igmp-snp**

**debug igmp-snp event**

**debug igmp-snp packet**

**debug igmp-snp msf**

**debug igmp-snp warning**

**undebug igmp-snp**

**undebg igmp-snp event**

**undebg igmp-snp packet**

**undebg igmp-snp msf**

**undebg igmp-snp warning**

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

EXEC

# 17 PIM-Snooping

## 17.1 PIM-Snooping

PIM-Snooping

- ' **ip pim snooping**
- ' **ip pim snooping**
- ' **show ip pim snooping**
- ' **show ip pim snooping vlan**

### 17.1.1 ip pim snooping

	PIM-Snooping	<b>ip pim snooping</b>
no	PIM-Snooping	
<b>ip pim snooping</b>		
<b>no ip pim snooping</b>		

PIM-Snooping

Ruijie# ~~configure terminal~~ **configure terminal** 6(snooping)]TJ/C2\_0 1 Tf0 Tc 7.726 0T

PIM-Snooping                    **ip pim snooping**  
no                                    PIM-Snooping

**ip pim snooping**  
**no ip pim snooping**

PIM-Snooping

```
Ruijie# configure terminal  
Ruijie(config)# interface vlan 199  
Ruijie(config-if)# ip pim snooping
```

---

/

---

PIM-Snooping	VLAN	PIM
--------------	------	-----

---

### 17.1.3 show ip pim snooping

PIM-Snooping

**show ip pim snooping**

**show ip pim snooping**

PIM-Snooping

```
Ruijie#show ip pim snooping
PIM Snooping table: 2 neighbours, Memory:16
Interface VLAN 7(4103), PC:2
Port GigabitEthernet 0/7(7), NC:1
Neighbour 4.4.4.1, GenID 0X2f853a91, Holdtime 105s, NLT
79s
Port GigabitEthernet 0/8(8), NC:1
Neighbour 4.4.4.2, GenID 0X38545b24, Holdtime 105s, NLT
81s
```

### 17.1.4 show ip pim snooping vlan

PIM-Snooping VLAN **show ip pim snooping**  
**vlan interface-number**  
**show ip pim snooping vlan** *interface-number*



# 18 MSTP

## 18.1

### 18.1.1 spanning-tree

MSTP no MSTP spanning-tree MSTP no  
spanning tree

**spanning-tree** [ **forward-time** *seconds* | **hello-time** *seconds* |  
**max-age** *seconds* ]

**no spanning-tree** [**forward-time** | **hello-time** | **max-age**]

**forward-time** *seconds*

**hello-time** *seconds* BPDU

**max-age** *seconds* BPDU

spanning-tree

" **forward-time** **hello-time**

```
show spanning-tree      STP
spanning-tree mst cost  STP      PathCost
spanning-tree tx-hold-count STP      TxHoldCount
```

### 18.1.2 spanning-tree bpdudfilter

```
disabled                BPDUD filter                enabled
spanning-tree bpdudfilter [enabled | disabled]
```

```
enabled                BPDUD filter
Disabled               BPDUD filter
```

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

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

### 18.1.3 spanning-tree bpduguard

```
disabled                BPDUD Guard                enabled
spanning-tree bpduguard [enabled | disabled]
```

```
enabled                BPDUD Guard
disabled               BPDUD Guard
```

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

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

### 18.1.4 spanning-tree link-type

```
“ ” no
```

```
spanning-tree link-type [point-to-point | shared]
```

```
no spanning-tree link-type
```

```
point-to-point point-to-point.
```

```
Shared shared
```

```
point-to-point
shared
```

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

```
/ BA20_
```

**no spanning-tree max-hops**

```
hop-count BPDU 1 40
```

```
hop-count 20
```

```

Region      Root Bridge      BPDU      Hot Count      Root
Bridge
BPDU              Hop Count      1          0
Hops      0 BPDU

```

```
max-hops Instance
```

```
MST Instance Max-hops 10
```

```
Ruijie(config)# spanning-tree max-hops 10
```

**show spanning-tree mst**

```
show spanning-tree MSTP
```

**18.1.6 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
```

## 18.1.7 spanning-tree mst configure

```
no MST MSTP Region
name revision vlan map
```

```
spanning-tree mst configuration
```

```
no spanning-tree mst configuration
```

```
instance vlan Vlan Instance 0
name
revision 0
```

```
end Ctrl+C
```

```
exit
```

```
MST
```

```
instance instance-id vlan vlan-range Vlan MST Instance
instance-id 0 64 vlan 1 4095 vlan-range
vlan VLAN ID VLAN ID
VLAN ID instance 10 vlan 2,3,6-9
VLAN 2 3 6 7 8 9 Instance 10
VLAN Instance 0 VLAN Instance
no no instance instance-id [vlan vlan-range] ( no
Instance 1 64)
name name MST 32
no name
revision version>
```

```

show           MST region

MST           VLAN 3, 5-10           MST

Instance 1

Ruijie(config)# spanning-tree mst configuration
Ruijie(config-mst)# instance 1 vlan 3 5-10
Ruijie(config-mst)# name region 1
Ruijie(config-mst)# revision 1
Ruijie(config-mst)# show
MST configuration
Name [region1]
Revision 1
Instance  Vlans Mapped
-----  -----
0         1-2,4,11-4094
1         3,5-10
-----

Ruijie(config-mst)# exit
Ruijie(config)#

```

```

VLAN 3 Instance 1           MST

```

```

Ruijie(config-mst)# no instance 1 vlan 3

```

```

Instance 1

```

```

Ruijie(config-mst)# no instance 1

```

```

MST           show

```

```

show spanning-tree mst           MST region

instance instance-id vlan vlan-range   Vlan           MST Instance

name           MST

revision           MST

show           MST           MST

```

## 18.1.8 spanning-tree mst cost

```

Instance           no

```

**spanning-tree [mst *instance-id*] cost *cost***

**no spanning-tree [mst *instance-id*] cost**

```
instance-id Instance          0 64
cost                1 200 000 000
```

Instance-ID 0

Interface

- 1000 Mbps—20000
- 100 Mbps—200000
- 10 Mbps—2000000

cost

Instance 3 400

```
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# spanning-tree mst 3 cost 400
```

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

**show spanning-tree mst** MSTP

**spanning-tree mst port-priority**

**spanning-tree mst priority** instance

### 18.1.9 spanning-tree mst port-priority

Instance

Region

no

**spanning-tree [mst *instance-id*] port-priority *priority***

**no spanning-tree [mst *instance-id*] port-priority**

```
Instance-id Instance          0 64
priority          0 16 32 48 64 80 96 112 128
144 160 176 192 208 224 240 16          16
```

```
Instance-id          0
priority             128
```

Region

```
Instance 20 Gigabitethernet 1/1
10
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# spanning-tree mst 20 port-priority
0
```

```
priority          0, 4096,8192, 12288, 16384, 20480,
24576, 28672, 32768, 36864, 40960, 45056, 49152,53248, 57344
61440    16          4096
```

```
instance-id      0
```

```
priority         32768
```

```
Instance 20          8192
```

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

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

```
show spanning-tree mst          MSTP
```

```
spanning-tree mst cost
```

```
spanning-tree mst port-priority Instance
```

### 18.1.11 spanning-tree reset

```
spanning-tree          no
```

```
spanning-tree reset
```

```
Ruijie(config)# spanning-tree reset
```

```
show spanning-tree          STP
```

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

### 18.1.12 spanning-tree tx-hold-count

---

STP TxHoldCount BPDU  
no

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

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

*tx-hold-count* TxHoldCount 1 10

3

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

**show spanning-tree** MSTP

### 18.1.13 spanning-tree pathcost method

no

**spanning-tree pathcost method** [long | short]

**no spanning-tree pathcost method**

**long** 802.1t path-cost

**short** 802.1d path-cost

802.1T Path-cost

Ruijie(config-if)# **spanning-tree pathcost method** long

**show spanning-tree interface** STP

### 18.1.14 spanning-tree portfast

```

Portfast disabled
Portfast
spanning-tree portfast [disabled]

disabled Portfast

```

```

Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# spanning-tree portfast

```

```

show spanning-tree interface STP

```

### 18.1.15 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 error-disabled
show spanning-tree

```

---

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

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

### 18.1.16 spanning-tree portfast bpdufilter default

```
BPDU filter no BPDU
filter
```

```
spanning-tree portfast bpdufilter default
```

```
no spanning-tree portfast bpdufilter default
```

```
BPDU filter
```

```
BPDU Filter BPDU show
spanning-tree
```

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

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

### 18.1.17 spanning-tree portfast default

```
Portfast no
Portfast
```

```
spanning-tree portfast default
```

```
no spanning-tree portfast default
```

## Portfast

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

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

### 18.1.18 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
```

### 18.1.19 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
```

### 18.1.20 spanning-tree tc-guard

```
tc-guard no tc-guard
tc-guard tc
```

**spanning-tree tc-guard**

**no spanning-tree tc-guard**

tc-guard

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

### 18.1.21 spanning-tree guard root

```
root guard no root guard
root guard
```

**spanning-tree guard root**

**no spanning-tree guard root**

root guard



```
Ruijie(config-if)# spanning-tree guard loop
```

### 18.1.24 spanning-tree guard none

```
guard no guard
spanning-tree guard none
no spanning-tree guard none
```

```
guard
```

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

### 18.1.25 spanning-tree autoedge

```
Autoedge disabled
Autoedge
spanning-tree autoedge [disabled]

disabled Autoedge
```

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

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

## 18.1.26 bpdu src-mac-check

```
                bpdu mac                no
            bpdu mac

bpdu src-mac-check H.H.H

no bpdu src-mac-check

H.H.H                mac                bpdu

no                bpdu
```

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

## 18.1.27 clear spanning-tree detected-protocols

```
RSTP BPDU    BPDU

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

interface-id
```

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

**show spanning-tree interface**

STP

**18.1.28 spanning-tree compatible enable**

MSTI

## 18.2

### 18.2.1 show spanning-tree

**show spanning-tree** [summary | forward-time | hello-time | max-age | inconsistentports | tx-hold-count | pathcost method | max\_hops]

<b>summary</b>	MSTP	instance	
<b>Inconsistentports</b>			block
<b>forward-time</b>	BridgeForwardDelay		
<b>hello-time</b>	BridgeHelloTime		
<b>max-age</b>	BridgeMaxAge		
<b>max-hops</b>	instance		
<b>tx-hold-count</b>	TxHoldCount		
<b>pathcost method</b>			

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

<b>spanningtree pathcost method</b>		
<b>spanning-tree forward-time</b>	BridgeForwardDelay	
<b>spanning-tree hello-time</b>	BridgeHelloTime	
<b>spanning-tree max-age</b>	BridgeMaxAge	
<b>spanning-tree max-hops</b>	instance	
<b>spanning-tree tx-hold-count</b>	TxHoldCount	

### 18.2.2 show spanning-tree interface

STP

---

```
show spanning-tree interface interface-id [{bpdufilter | portfast | bpduguard | link-type } ]
```

*interface-id*

```
bpdufilter      bpdufilter
portfast       portfast
bpduguard      bpduguard
link-type      linktype
```

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

```
spanning-tree bpdufilter          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
```

```
instance-id      Instance
```

```
interface-id
```

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 monitor session

SPAN

no

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

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

**no monitor session all**

<i>session_number</i>	SPAN
<b>source interface</b> <i>interface-id</i>	interface-id SVI S8600 AP
<b>destination interface</b> <i>interface-id</i>	interface-id SVI S8600 AP
<b>both</b> <b>acl name</b>	<b>acl name/id</b>
<b>rx</b>	
<b>tx</b>	
<b>all</b>	
<b>switch</b>	

switch port    routed port

SPAN

SPAN  
disabled port

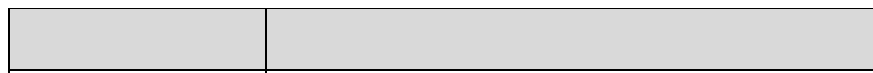
SPAN



**show monitor**

SPAN 1

```
Ruijie# show monitor session 1
sess-num: 1
src-intf:
GigabitEthernet 3/1 frame-type Both
dest-intf:
GigabitEthernet 3/8
```

**monitor session**

SPAN

## 20 RSPAN

### 20.1

#### 20.1.1 monitor session

RSPAN

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

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

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

<i>session-num</i>	
<i>vlan-id</i>	<b>remote span vlan id</b>
<i>Interface-id</i>	

**end**                   Ctrl+C

**exit**

```
Ruijie(config)# monitor session 1 source interface
fastethernet 0/1
```

```
Ruijie(config)# monitor session 1 destination
remote vlan 5 reflector-port interface fastethernet 0/5
```

```
Ruijie(config)# monitor session 1 remote-destination
```

show monitor	

## 20.1.2 remote-span

### RSPAN VLAN

```
[no] remote-span
```

Vlan

```
end
```

Ctrl+C

```
exit
```

```
Ruijie(config)# vlan 5
```

```
Ruijie(config-vlan)# remote-span
```

show vlan	Vlan

# 21 IP

## 21.1

- ' ip address
- ' ip unnumbered

### 21.1.1 ip address

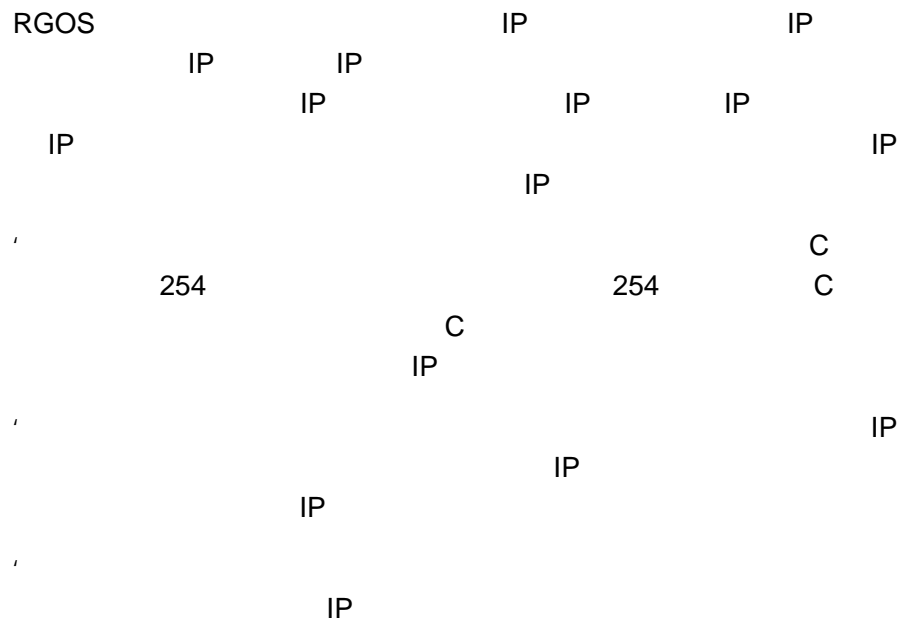
IP no IP

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

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

<i>ip-address</i>	32	IP	8	
<i>network-mask</i>	32	8	"1"	"0"
<b>secondary</b>		IP		

IP



```

255.255.255.0
ip address 10.10.10.1 255.255.255.0

```

<b>show interface</b>	

### 21.1.2 ip unnumbered

IP IP no

```

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

```

<i>interface-type</i>	

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

```

                IP           IP
                IP           IP
            IP       IP       IP       IP
        '
        '               SLIP  HDLC  PPP  LAPB  Frame-relay
        '               X.25
        '           ping
            IP           SNMP
        '
                                   FastEthernet 0/1
                IP
ip unnumbered fastEthernet 0/1
    
```

<b>show interface</b>	

## 21.2

- ```

'   arp
'   arp retry interval
'   arp retry times
'   arp trusted num
'   arp trusted aging
    
```

- ' **arp unresolve**
- ' **arp gratuitous-send interval**
- ' **arp timeout**
- ' **ip proxy-arp**
- ' **service trustedarp**

## 21.2.1 arp

|  | ARP | IP | MAC |
|--|-----|----|-----|
|  | no  |    | MAC |

**arp** *ip-address MAC-address type [ alias ]*

**no arp** *ip-address MAC-address type [ alias ]*





**clear arp-cache**

arp

IP

5 ARP

no

**arp retry times** *number*

**no arp retry times**

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

ARP

ARP

5

ARP

V

p

"

u

Y

|               |                  |
|---------------|------------------|
|               |                  |
| <i>number</i> | ARP<br><10-4096> |

ARP

ARP  
ARP

1000

ARP

arp trusted 1000

|                           |     |
|---------------------------|-----|
|                           |     |
| <b>service trustedarp</b> | ARP |

### 21.2.5 arp trusted aging

ARP

no

**arp trusted aging****no arp trusted aging**

GSN ARP

ARP

arp timeout

ARP

|                    |     |
|--------------------|-----|
|                    |     |
| service trustedarp | ARP |

### 21.2.6 arp unresolve

ARP  
8192

no

arp unresolve *number*

no arp unresolve

|               |                        |
|---------------|------------------------|
|               |                        |
| <i>number</i> | ARP<br>8192 < 1-8192 > |

ARP

8192

ARP

500

arp unresolved 500

### 21.2.7 arp gratuitous-send interval

---

```
arp no
```

```
arp gratuitous-send interval seconds
```

```
no arp gratuitous-send
```

|                |                 |
|----------------|-----------------|
|                |                 |
| <i>seconds</i> | ARP<br><1-3600> |

```
ARP
```

```
ARP
```

```
SVI 1
```

```
ARP
```

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

```
SVI 1
```

```
ARP
```

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

## 21.2.8 arp timeout

```
ARP ARP
no
```

```
arp timeout seconds
```

```
no arp timeout
```

|                |           |
|----------------|-----------|
|                |           |
| <i>seconds</i> | 0-2147483 |

3600

```
ARP                IP        MAC
                    ARP                ARP
                    ARP
```

```
                    FastEthernet 0/1    ARP
                    120
```

```
interface fastEthernet 0/1
arp timeout 120
```

|                        |     |
|------------------------|-----|
|                        |     |
| <b>clear arp-cache</b> | ARP |
| <b>show interface</b>  |     |

### 21.2.9 ip proxy-arp

ARP

---

```

      ARP
    IP  MAC
      IP          IP          ARP  ARP          IP
      MAC          ARP          MAC
      ARP          ARP
      FastEthernet 0          ARP
interface fastEthernet 0
ip proxy-arp

```

### 21.2.10 service trustedarp

```

      ARP          service trustedarp
no          ARP
service trustedarp
no service trustedarp

```

```

      ARP

```

```

      ARP          ARP          GSN
      GSN
      STP          MAC          MAC
      MAC          ARP
1)  STP
2)  root port          design          ,
   updown
3)  tc
      service trustedarp
config
service trustedarp

```

## 21.3

- ' **ip broadcast-addresss**
- ' **ip directed-broadcast**

### 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          1          255.255.255.255
RGOS       IP
  1
IP          0.0.0.0
ip broadcast-address 0.0.0.0

```

### 21.3.2 ip directed-broadcast

```

IP          ip
directed-broadcast no
ip directed-broadcast [ access-list-number ]
no ip directed-broadcast

```

|  |  |
|--|--|
|  |  |
|--|--|

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

IP

172.16.16.255

IP

IP

IP

IP

1

**no ip directed-broadcast** RGOS

FastEthernet 0/1

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

## 21.4 IP

IP

- ' **clear arp-cache**
- ' **show arp**
- ' **show arp counter**
- ' **show arp timeout**
- ' **clear ip route**

- ' **show ip arp**
- ' **show ip interface**

### 21.4.1 clear arp-cache

ARP ARP IP  
clear arp-cache  
**clear arp-cache** [A.B.C.D] | **interface** *interface-name*]

ARP

---

NFPP(Network Foundation Protection Policy, )  
mac ( IP) ARP  
clear arp 1s  
ARP

---

ARP  
clear arp-cache  
ARP 1.1.1.1  
clear arp-cache 1.1.1.1  
SVI1 ARP  
clear arp-cache interface Vlan 1

|            |     |
|------------|-----|
|            |     |
| <b>arp</b> | ARP |

### 21.4.2 show arp

ARP

---

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

| <i>ip</i>          | ip      | ip  | ARP |
|--------------------|---------|-----|-----|
| <i>ip mask</i>     | ip mask |     | ARP |
| <i>mac-address</i> | mac     |     | ARP |
| <b>static</b>      | arp     |     |     |
| <b>complete</b>    |         | arp |     |
| <b>incomplete</b>  |         | arp |     |

show arp

Ruijie# **show arp**

Total Numbers of Arp: 7

| Protocol | Address        | Age(min) | Hardware       |
|----------|----------------|----------|----------------|
| 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

i

**show arp counter**

```
Ruijie# show arp counter
The Arp Entry counter:0
The Unresolve Arp Entry:0
```

**21.4.4 show arp detail**

ARP

**show arp detail****show arp detail interface-type** *interface-number***show arp detail** [*vrf vrfname*] [**ip** [*mask*] | *mac-address* | **static** | **complete** | **incomplete**]**show arp detail trusted** [**ip** [*mask*]]

|                                        |         |    |     |
|----------------------------------------|---------|----|-----|
| <i>interface-type interface-number</i> | ARP     |    |     |
| <b>vrf</b> <i>vrfname</i>              |         |    |     |
| <i>ip</i>                              | ip      | ip | ARP |
| <i>ip mask</i>                         | ip mask |    | ARP |
| <i>mac-address</i>                     | mac     |    | ARP |
| <b>static</b>                          | arp     |    |     |
| <b>complete</b>                        | arp     |    |     |
| <b>incomplete</b>                      | arp     |    |     |
| <b>trusted</b>                         | ARP     |    |     |

ARP

ARP

**show arp detail**

Ruijie# show arp detail

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

ARP

|             |     |
|-------------|-----|
|             |     |
| IP Address  | IP  |
| MAC Address | IP  |
| Type        | ARP |
| Age         | ARP |
| Interface   | IP  |
| Port        | ARP |

|   |   |
|---|---|
|   |   |
| - | - |

|  |  |
|--|--|
|  |  |
|--|--|

10.3(5)

## 21.4.5 show arp timeout

ARP

**show arp timeout**

**show arp timeout**

```
Ruijie# show arp timeout
Interface          arp timeout(sec)
-----
VLAN 1             3600

ARP
```

## 21.4.6 clear ip route

IP IP

**clear ip route**

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

| *              |  |
|----------------|--|
| <i>network</i> |  |
| <i>netmask</i> |  |

192.168.12.0

clear ip route 192.168.12.0

|                      |    |
|----------------------|----|
|                      |    |
| <b>show ip route</b> | IP |

## 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<br>“_” |
| Hardware  | IP         |

Type

h t~@2M-p™IfENüDh—6078111525342&gt;NjDhE%0V26A24



# 22 IP

## 22.1 IP

```
IP
' ip mask-reply
' ip mtu
' ip redirects
' ip source-route
' ip unreachable
```

### 22.1.1 ip mask-reply

```
RGOS ICMP
ip mask-reply no ICMP
no ip mask-reply
```

```
ICMP
```

```
ICMP
```

```
ICMP
```

```
FastEthernet 0/1
```

```
ICMP
```

```
interface fastEthernet 0/1
ip mask-reply
```

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



ICMP

RGOS

ICMP

FastEthernet 0/1

ICMP

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

### 22.1.4 ip source-route

RGOS

IP

ip

**source-route** no

**ip source-route**

**no ip source-route**

RGOS

IP

IP

IP

RFC 791

ICMP

RGOS

IP

IP

no ip source-route

## 22.1.5 ip unreachablees

```
RGOS          ICMP          ip
unreachablees no          ICMP
ip unreachablees
no ip unreachablees
```

```
RGOS          ICMP
```

```
RGOS
ICMP
```

```
ICMP
```

```
FastEthernet 0/1    ICMP
```

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

## 23 DHCP

### 23.1 DHCP

DHCP

- ' **bootfile**
- ' **client-identifier**
- ' **client-name**
- ' **default-router**
- ' **dns-server**
- ' **domain-name**
- ' **hardware-address**
- ' **host**
- ' **ip address dhcp**
- ' **ip dhcp excluded-address**
- ' **ip dhcp ping packet**
- ' **ip dhcp ping timeout**
- ' **ip dhcp pool**
- ' **lease**
- ' **netbios-name-server**
- ' **netbios-node-type**
- ' **network DHCP**
- ' **next-server**
- ' **option**
- ' **service dhcp**

#### 23.1.1 bootfile

|                    |                  |           |      |
|--------------------|------------------|-----------|------|
|                    | DHCP             |           | DHCP |
| <b>bootfile</b>    |                  | <b>no</b> |      |
| <b>bootfile</b>    | <i>file-name</i> |           |      |
| <b>no bootfile</b> |                  |           |      |

|                  |  |
|------------------|--|
|                  |  |
| <i>file-name</i> |  |

DHCP

DHCP

DHCP

TFTP

DHCP

**next-server**

router.conf

bootfile router.conf

|                     |            |
|---------------------|------------|
|                     |            |
| <b>ip dhcp pool</b> | DHCP DHCP  |
| <b>next-server</b>  | DHCP<br>IP |

### 23.1.2 client-identifier

DHCP

DHCP

**client-identifier**

**no**

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

**no client-identifier**

|                          |                                                                            |
|--------------------------|----------------------------------------------------------------------------|
|                          |                                                                            |
| <i>unique-identifier</i> | DHCP<br>0100.d0f8.2233.b467.6967.6162.6974.4574.686<br>5.726e.6574.302f.31 |

DHCP

```

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

DHCP

```

MAC
00d0.f822.33b4
DHCP

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

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



DHCP

DHCP DHCP DHCP IP

192.168.12.1

default-router 192.168.12.1

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

### 23.1.5 dns-server

DHCP DNS DHCP  
**dns-server no DNS**  
**dns-server** { *ip-address* [ *ip-address2...ip-address8* ] |  
**use-dhcp-client** *interface-type interface-number* }  
**no dns-server**

|                                                                            |                              |
|----------------------------------------------------------------------------|------------------------------|
|                                                                            |                              |
| <i>ip-address</i>                                                          | DNS IP                       |
| <i>ip-address2...ip-address8</i>                                           | 8 DNS                        |
| <b>use-dhcp-client</b><br><i>interface-type</i><br><i>interface-number</i> | RGOS DHCP<br>DNS DHCP<br>DNS |

DNS

DHCP

DNS  
DNS

DHCP  
DNS

RGOS

DHCP  
DHCP

DNS

DHCP

DNS

192.168.12.3

`dns-server 192.168.12.3`

|                        |           |
|------------------------|-----------|
|                        |           |
| <b>domain-name</b>     | DHCP      |
| <b>ip address dhcp</b> | DHCP IP   |
| <b>ip dhcp pool</b>    | DHCP DHCP |

### 23.1.6 domain-name

DHCP  
**no**

DHCP

**domain-name**

**domain-name** *domain-name*

**no domain-name**

|                    |      |
|--------------------|------|
|                    |      |
| <i>domain-name</i> | DHCP |

DHCP

DHCP

DHCP

i-net.com.cn

domain-name i-net.com.cn

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

### 23.1.7 hardware-address

DHCP

DHCP

```
hardware-address 00d0.f838.bf3d
```

| <b>client-identifier</b> | DHCP      |
|--------------------------|-----------|
| <b>host</b>              | IP DHCP   |
| <b>ip dhcp pool</b>      | DHCP DHCP |

### 23.1.8 host

```

DHCP      IP      DHCP
host    no      DHCP    IP

```

```
host ip-address [ netmask ]
```

```
no host
```

| <i>ip-address</i> | DHCP IP |
|-------------------|---------|
| <i>netmask</i>    | DHCP    |

```
IP
```

```
DHCP
```

```

DHCP      IP
A          255.0.0.0 B          255.255.0
C          255.255.255.0

```

```
DHCP
```

```

IP          192.168.12.91
255.255.255.240
host 192.168.12.91 255.255.255.240

```

|                          |      |
|--------------------------|------|
|                          |      |
| <b>client-identifier</b> | DHCP |
| <b>hardware-address</b>  | DHCP |

**ip dhcp pool**

DHCP  
DHCP

DHCP

### 23.1.10 ip dhcp excluded-address

IP DHCP DHCP  
**ip dhcp excluded-address no**

**ip dhcp excluded-address** *low-ip-address* [ *high-ip-address* ]  
**no ip dhcp excluded-address** *low-ip-address* [ *high-ip-address* ]

|                        |    |    |
|------------------------|----|----|
|                        |    |    |
| <i>low-ip-address</i>  | IP | IP |
|                        | IP |    |
| <i>high-ip-address</i> |    | IP |

DHCP IP

IP DHCP IP DHCP  
 DHCP IP DHCP

DHCP 192.168.12.100~150  
 IP

`ip dhcp excluded-address 192.168.12.100 192.168.12.150`

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

### 23.1.11 ip dhcp ping packet

DHCP  
ip dhcp ping packet

ping  
no

ip dhcp ping packet [ *number* ]

no ip dhcp ping packet

|               |                          |
|---------------|--------------------------|
|               |                          |
| <i>number</i> | ping 0 10 0<br>ping ping |

ping 2

DHCP DHCP IP ping

DHCP Ping

10

ping 3

ip dhcp ping packets 3

|                               |      |
|-------------------------------|------|
|                               |      |
| <b>clear ip dhcp conflict</b> | DHCP |

**ip dhcp ping timeout** *milli-seconds*

**no ip dhcp ping timeout**

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

500

ping

ping 600ms

ip dhcp ping timeout 600

| <b>clear ip dhcp conflict</b> | DHCP      |
|-------------------------------|-----------|
| <b>ip dhcp ping packets</b>   | DHCP ping |
| <b>show ip dhcp conflict</b>  | DHCP      |

### 23.1.13 ip dhcp pool

DHCP DHCP  
**ip dhcp pool** **no** DHCP

**ip dhcp pool** *pool-name*

**no ip dhcp pool** *pool-name*

| <i>pool-name</i> | mypool 1 |
|------------------|----------|

## DHCP

## DHCP

```
Ruijie(dhcp-config)#
```

```
IP          DNS
```

```
mypool0    DHCP
```

```
ip dhcp pool mypool0
```

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

## 23.1.14 lease

```
DHCP
```

```
DHCP
```

```
lease      no
```

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

```
no lease
```

| <i>days</i>     |  |
|-----------------|--|
| <i>hours</i>    |  |
| <i>minutes</i>  |  |
| <i>infinite</i> |  |

DHCP

```

DHCP
DHCP
DHCP 1
lease 0 1
DHCP 1
lease 0 0 1
    
```

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

### 23.1.15 netbios-name-server

```

DHCP NETBIOS WINS DHCP
netbios-name-server no WINS
    
```

```

netbios-name-server ip-address [ ip-address2...ip-address8 ]
no netbios-name-server
    
```

|                                  |      |      |
|----------------------------------|------|------|
|                                  |      |      |
| <i>ip-address</i>                | WINS | IP   |
| <i>ip-address2...ip-address8</i> | 8    | WINS |

WINS

DHCP

WINS  
WINS

DHCP  
WINS

DHCP

WINS

192.168.12.3

netbios-name-server 192.168.12.3



DHCP

```

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

```

```

WINS      NetBIOS      WINS
           NetBIOS      Hybrid

```

```

DHCP      NetBIOS

```

```
netbios-node-type h-node
```

|                            |      |         |
|----------------------------|------|---------|
|                            |      |         |
| <b>ip dhcp pool</b>        | DHCP | DHCP    |
| <b>netbios-name-server</b> | WINS | NETBIOS |

### 23.1.17 network DHCP

```

DHCP      DHCP
network    no
network net-number net-mask
no network

```

|                   |      |    |
|-------------------|------|----|
|                   |      |    |
| <i>net-number</i> | DHCP | IP |
| <i>net-mask</i>   | DHCP | IP |



DHCP

DHCP

DHCP

192.168.12.4

next-server 192.168.12.4

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

### 23.1.19 option

no DHCP option DHCP option

**option** *code* { **ascii** *string* | **hex** *string* | **ip** *ip-address* }

**no option**

|                             |       |
|-----------------------------|-------|
|                             |       |
| <i>code</i>                 | DHCP  |
| <b>ascii</b> <i>string</i>  | ASCII |
| <b>hex</b> <i>string</i>    |       |
| <b>ip</b> <i>ip-address</i> | IP    |

DHCP TCP/IP  
DHCP option DHCP 312 option  
DHCP DHCP  
DHCP option RFC 2131

19 DHCP  
IP 0 IP 1 IP  
DHCP IP

option 19 hex 1

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

|  |       |
|--|-------|
|  | END 1 |
|--|-------|



**dhcp pool**                    DHCP                    DHCP                    **no ip**

                                 IP            192.168.12.100    DHCP

clear ip dhcp binding 192.168.12.100



R

| <b>ip dhcp ping packets</b>  | DHCP<br>ping |
|------------------------------|--------------|
| <b>show ip dhcp conflict</b> | DHCP         |

### 23.2.3 clear ip dhcp server statistics

DHCP **clear ip dhcp**  
**server statistics**  
**clear ip dhcp server statistics**

DHCP DHCP  
**ip dhcp server statistics** DHCP **clear**

DHCP  
`clear ip dhcp server statistics`

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

### 23.2.4 debug ip dhcp client

DHCP Client **debug ip dhcp client**  
**debug ip dhcp client**  
**no debug ip dhcp client**

dhcp client

dhcp

debug ip dhcp client

### **23.2.5 debug ip dhcp server**

DHCP Server

**debug ip dhcp server**

**debug ip dhcp server**

**no debug ip dhcp server**

dhcp server

dhcp

debug ip dhcp server

## 23.2.6 show dhcp lease

```

DHCP                               EXEC   show dhcp lease
show dhcp lease

```

```

IP                                   IP
IP

```

### show dhcp lease

```

Ruijie# show dhcp lease
Temp IP addr: 192.168.5.71  for peer on Interface:
FastEthernet0/0
Temp sub net mask: 255.255.255.0
DHCP Lease server: 192.168.5.70, state: 3 Bound
DHCP transaction id: 168F
Lease: 600 secs, Renewal: 300 secs, Rebind: 525 secs
Temp default-gateway addr: 192.168.5.1
Next timer fires after: 00:04:29
Retry      count:      0                      Client-ID:
redgaint-00d0.f8fb.5740-Fa0/0

```

## 23.2.7 show ip dhcp binding

```

DHCP                               EXEC   show ip dhcp binding
show ip dhcp binding [ ip-address ]

```

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

IP IP  
IP 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
    
```

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

|                              | DHCP |
|------------------------------|------|
| <b>clear ip dhcp binding</b> | 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
```

| IP address               | DHCP IP |
|--------------------------|---------|
| Detection Method         |         |
| dhcpd excluded ipaddress |         |

## DHCP

**show ip dhcp server statistics**Ruijie# **show ip dhcp server statistics**

```

Address pools          4
Automatic bindings    4
Manual bindings       0
Expired bindings      0
Malformed messages 2

```

```

Message                Received
BOOTREQUEST           216
DHCPDISCOVER          33
DHCPRREQUEST          25
DHCPCDECLINE          0
DHCPCRELEASE          1
DHCPCINFORM           150

```

```

Message                Sent
BOOTREPLY             16
DHCPCOFFER            9
DHCPCACK              7
DHCPCNAK              0

```

| Address pools            |      |
|--------------------------|------|
| Automatic bindings       |      |
| Manual bindings          |      |
| Expired bindings         |      |
| Malformed messages       | DHCP |
| Message Received or Sent | DHCP |

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

# 24 DHCP Relay

## 24.1 DHCP Relay

DHCP

- ' **service dhcp**
- ' **ip helper-address**

### 24.1.1 service dhcp

no DHCP DHCP service dhcp  
service dhcp  
no service dhcp

DHCP

DHCP DHCP DHCP  
DHCP DHCP DHCP

DHCP

service dhcp

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

### 24.1.2 ip helper-address

DHCP no

DHCP

```

/

dhcp DHCP
vrf
vrf
vrf
vrf
61.154.26.49 vrf local vrf 192.168.197.1
ip helper-address 61.154.26.49
ip helper-address vrf local 192.168.197.1
    
```

|              |      |
|--------------|------|
|              |      |
| service dhcp | DHCP |

### 24.1.3 ip dhcp relay information option dot1x

```

dhcp option dot1x no
dhcp option dot1x
    
```

DHCP relay 802.1x

```
Ip dhcp relay information option dot1x
```

|                                                            |                  |
|------------------------------------------------------------|------------------|
|                                                            |                  |
| <b>service dhcp</b>                                        | DHCP             |
| <b>ip dhcp relay information option dot1x access-group</b> | option dot1x acl |

#### 24.1.4 ip dhcp relay information option dot1x access-group

```

                dhcp option dot1x acl          no
dhcp option dot1x acl

```

ACL

ACL ACE

```
Ip dhcp relay information option dot1x access-group
acl-name
```

|                                               |                   |
|-----------------------------------------------|-------------------|
|                                               |                   |
| <b>service dhcp</b>                           | DHCP              |
| <b>ip dhcp relay information option dot1x</b> | DHCP option dot1x |

#### 24.1.5 ip dhcp relay information option82

```

no          ip dhcp relay information option82
            ip dhcp relay information option82

```

option dot1x

Ip dhcp relay information option82

|                                               |                   |
|-----------------------------------------------|-------------------|
|                                               |                   |
| <b>Service dhcp</b>                           | DHCP              |
| <b>ip dhcp relay information option dot1x</b> | DHCP option dot1x |

### 24.1.6 ip dhcp relay check server-id

no **ip dhcp relay check *server-id***  
**ip dhcp relay information check *server-id***

server-id option                      DHCP REQUEST  
                                                                                  server

Ip dhcp relay check server-id

|                     |      |
|---------------------|------|
|                     |      |
| <b>Service dhcp</b> | DHCP |

### 24.1.7 ip dhcp relay suppression

```

DHCP                DHCP                no
                   DHCP relay
    
```

```

DHCP request        relay
    
```

```

1 relay
    
```

```

Ruijie#
Ruijie# configure terminal
Ruijie(config)# interface fastEthernet 0/1
Ruijie(config-if)# ip dhcp relay suppression
Ruijie(config-if)# exit
Ruijie(config)#
    
```

|                     |      |
|---------------------|------|
|                     |      |
| <b>service dhcp</b> | 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**

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

### 25.1.2 ip name-server

IP

no

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

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

DNS Server IP Server DNS  
Server Server  
Server DNS  
6

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

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

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

## 25.1.4 clear host

**clear host** [*host-name*]

|                  |     |
|------------------|-----|
|                  |     |
| <i>host-name</i> | “*” |

```

DNS                               1    ip host    2
                                   DNS

```

-IP

```
clear host *
```

|                   |  |
|-------------------|--|
|                   |  |
| <b>show hosts</b> |  |

## 25.1.5 show hosts

DNS

**show hosts**

DNS

```
Ruijie# show hosts
```

```
Name servers are:
```

```
static
```

```
host          type          address
```

```
switch        static        192.168.5.243
```

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

| <b>ip host</b>        | IP  |
|-----------------------|-----|
| <b>ip name-server</b> | DNS |

## 26 SNTP

### 26.1

- ' **sntp enable**
- ' **sntp server**
- ' **sntp interval**

#### 26.1.1 sntp enable

SNTP
**no**  
 —Disable  
**[no] sntp enable**

SNTP      Disable

**show sntp**      SNTP

Ruijie(config)# **sntp enable**

| <b>show sntp</b>             | SNTP |
|------------------------------|------|
| <b>clock update-calendar</b> |      |
| <b>clock set</b>             |      |

RGOS10.0

## 26.1.2 sntp server

|        |             |      |            |
|--------|-------------|------|------------|
|        | SNTP Server | SNTP | NTP        |
| Server | internet    |      | NTP Server |

**sntp server** *ip-addr*  
**no sntp server**

*ip-addr* NTP/SNTP IP

NTP/SNTP

**show sntp** SNTP

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

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

RGOS10.0

## 26.1.3 sntp interval

|             |                 |
|-------------|-----------------|
| SNTP Client | NTP/SNTP Server |
|-------------|-----------------|

**sntp interval** *seconds*  
**no sntp interval**

*seconds*

1800s

**show sntp**          SNTPRuijie(config)# **sntp interval 3600**

| <b>sntp enable</b>           | SNTP |
|------------------------------|------|
| <b>show sntp</b>             | SNTP |
| <b>clock update-calendar</b> |      |

RGOS10.0

---

**sntp enable**

---

## 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 sync interval  : 60  
Time zone            : +8
```

| <b>snmp enable</b> | SNTP |
|--------------------|------|
| <b>show snmp</b>   | SNTP |

RGOS10.0

# 27 NTP

## 27.1 NTP

NTP

- ' **no ntp**
- ' **ntp access-group**
- ' **ntp authenticate**
- ' **ntp authentication-key**
- ' **ntp disable**
- ' **ntp master**
- ' **ntp server**
- ' **ntp trusted-key**
- ' **ntp update-calendar**

### 27.1.1 no ntp

ntp  
**no ntp**

ntp

NTP

NTP  
NTP

NTP

NTP

NTP

**no ntp**

|                   |     |
|-------------------|-----|
|                   |     |
| <b>ntp server</b> | NTP |

### 27.1.2 ntp access-group

NTP

no

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

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

|             |     |
|-------------|-----|
|             |     |
| <b>peer</b> | NTP |



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

```
ntp authentication-key 6 md5 woooooop  
ntp trusted-key 6  
ntp authenticate
```

|                               |  |
|-------------------------------|--|
|                               |  |
| <b>ntp authentication-key</b> |  |
| <b>ntp trusted-key</b>        |  |

### 27.1.4 ntp authentication-key

NTP

NTP

**ntp authentication-key** *key-id* *ype*Tc 0.28 0 Td[(k4 0 j/C<2\_02405B504C]f10.5 0 0 10.5 4

md5 key-id  
**ntp trusted-key** key-id

1024

ID 6

ntp authentication-key 6 md5 woooooop

|                         |     |
|-------------------------|-----|
|                         |     |
| <b>ntp authenticate</b> |     |
| <b>ntp trusted-key</b>  |     |
| <b>ntp server</b>       | NTP |

### 27.1.5 ntp disable

NTP

**ntp disable**

NTP

NTP

NTP

---

IP

---

NTP

no ntp

### 27.1.6 ntp master

NTP

no

NTP

**ntp master** [*stratum*]

**no ntp master**



Ruijie(config)# **ntp master 12**

### 27.1.7 ntp server

NTP

NTP

**ntp server** *ip-addr* [ **version** *version* ] [ **source** *if-name* ] [ **key** *keyid* ][**prefer**]

**no ntp server** *ip-addr*

| <i>ip-addr</i> | NTP    | IP  | IPv4  | IPv6 |
|----------------|--------|-----|-------|------|
| <i>version</i> | NTP    | 1-3 | NTPv3 |      |
| <i>if-name</i> | NTP    |     |       |      |
| <i>keyid</i>   |        |     |       |      |
| <b>prefer</b>  | Prefer |     |       |      |

NTP

NTP  
IP                      NTP

NTP server

IPv4            Ruijie(config)# ntp server 192.168.210.222

|        |     |
|--------|-----|
|        |     |
| no ntp | NTP |

### 27.1.8 ntp trusted-key

ID

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

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

|               |    |
|---------------|----|
|               |    |
| <i>key-id</i> | ID |

NTP

ID

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

|  |  |
|--|--|
|  |  |
|--|--|

|                               |     |
|-------------------------------|-----|
| <b>ntp authenticate</b>       |     |
| <b>ntp authentication-key</b> | NTP |
| <b>ntp server</b>             | NTP |

### 27.1.9 ntp update-calendar

NTP

no

**ntp update-calendar**

**no ntp update-calendar**

NTP

NTP

NTP

NTP

Ruijie(config)# **ntp update-calendar**

## 27.2

' **debug ntp**

' **show ntp status**

## 27.2.1 debug ntp

NTP

**debug ntp**

**no debug ntp**

NTP

NTP

debug ntp

## 27.2.2 show ntp status

NTP

**show ntp status**

NTP

---

NTP

NTP

NTP

show ntp status

# 28 UDP-Helper

## 28.1

### 28.1.1 udp-helper enable

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

**ip helper-address** *address*  
**no ip helper-address** *address*

|                |                                                      |
|----------------|------------------------------------------------------|
|                |                                                      |
| <i>address</i> | UDP<br><div style="text-align: right;">&amp;\$</div> |

UDP

20  
 , UDP-Helper  
 UDP

**no ip helper-address**

UDP

Ruijie(config-if)# **ip helper-address** 192.168.100.1

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

### 28.1.3 ip forward-protocol

UDP UDP no

**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**]

|                   |                                              |
|-------------------|----------------------------------------------|
|                   |                                              |
| <i>port</i>       | 69,53,37,137,138,49                          |
| <b>tftp</b>       | Trivial File Transfer Protocol(69)<br>UDP 69 |
| <b>domain</b>     | Domain Name System(53) UDP<br>53             |
| <b>time</b>       | Time service(37) UDP<br>37                   |
| <b>netbios-ns</b> | NetBIOS Name Service(137)                    |

## 29 SNMP

### 29.1

SNMP

```
' no snmp-server
' snmp-server chassis-id
' snmp-server community
' snmp-server contact
' snmp-server enable traps
' snmp-server host
' snmp-server location
' snmp-server packetsize
' snmp-server queue-length
' snmp-server system-shutdown
' snmp-server trap-source
' snmp-server trap-timeout
' snmp-server user
' snmp-server group
' snmp-server view
' snmp-server if-index persist
```

#### 29.1.1 no snmp-server

SNMP

no snmp-server

no snmp-server

SNMP

SNMP

SNMP

Ruijie(config)# no snmp-server

## **29.1.2 snmp-server chassis-id**

SNMP





|                         |      |
|-------------------------|------|
|                         |      |
| <b>snmp-server host</b> | SNMP |

### 29.1.6 snmp-server host

```

SNMP      NMS
snmp-server host          no          SNMP

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

no snmp-server host host-addr

```

```

host-addr  SNMP
ipv6-addr  SNMP      ipv6
vrfname    vrf
version    snmp      V1  V2C  V3
auth | noauth | priv  V3
community-string          V3
port-num    snmp
notification-type          snmp

```

SNMP

#### snmp-server enable traps

```

NMS
SNMP
[ vrf ] vrf

```

|      |                          |               |
|------|--------------------------|---------------|
| SNMP |                          |               |
|      |                          | 12.219 public |
|      |                          |               |
|      | snmp-server enable traps |               |

### 29.1.7 snmp-server location

```

SNMP
location no SNMP snmp-server
snmp-server location text
no snmp-server location
text

```

```

Ruijie(config)# snmp-server location start-technology

```

*byte-count* 484 17876

1500

SNMP 1492

Ruijie(config)# **snmp-server packetsize 1492**

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

### 29.1.9 snmp-server queue-length

**snmp-server**

**queue-length**

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

*length* 1 1000

10

4

4

Ruijie(config)# **snmp-server queue-length 4**

|                               |      |
|-------------------------------|------|
|                               |      |
| <b>snmp-server packetsize</b> | SNMP |

### 29.1.10 snmp-server system-shutdown

```

SNMP
system-shutdown no SNMP
snmp-server system-shutdown
no snmp-server system-shutdown

```

SNMP

```

reload/reboot SNMP RGOS
NMS

```

SNMP

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

### 29.1.11 snmp-server trap-source

```

SNMP snmp-server
trap-source no
snmp-server trap-source interface
no snmp-server trap-source

```

```
interface SNMP
```

```
SNMP IP
```

SNMP IP  
 SNMP IP  
 0 IP SNMP

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

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

### 29.1.12 snmp-server trap-timeout

**snmp-server**  
**trap-timeout no**  
**snmp-server trap-timeout seconds**  
**no snmp-server trap-timeout**

*seconds*

30

60

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

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

### 29.1.13 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 {num | name}]
no snmp-server user username groupname {v1 | v2c | v3 }

username
groupname
v1 | v2 | v3      SNMP      v3
encrypted
                MD5      16      SHA
                20
auth            md5      MD5      sha
                SHA
auth-password:                32

priv            des56      56      DES
priv-password                32

snmpV3          md5          DES
Ruijie(config)# snmp-server user user-2 mib2user v3 auth
md5 authpasstr priv des56 despasstr

```

|                |      |
|----------------|------|
|                |      |
| show snmp user | SNMP |

## 29.1.14 snmp-server group

SNMP

```

view-name
oid-tree          MIB          MIB
include          MIB
exclude          MIB

                default          MIB

```

```

                MIB-2    oid  1.3.6.1
Ruijie(config)# snmp-server view mib2 1.3.6.1 include

```

|                |      |
|----------------|------|
|                |      |
| show snmp view | SNMP |

### 29.1.16 snmp-server if-index persist

```

                snmp-server if-index persist
no
snmp-server if-index persist
no snmp-server if-index persist

```

```

Ruijie(config)# snmp-server if-index persist

```

|                 |  |
|-----------------|--|
|                 |  |
| <b>show run</b> |  |

## 29.2

### 29.2.1 show snmp

SNMP

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

|                        |      |          |
|------------------------|------|----------|
| <b>show snmp</b>       | SNMP |          |
| <b>show snmp mib</b>   |      | snmp mib |
| <b>show snmp user</b>  | snmp |          |
| <b>show snmp view</b>  | snmp |          |
| <b>show snmp group</b> | snmp |          |

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

```

## SNMP

---

0 Trap PDUs  
SNMP global trap: disabled  
SNMP logging: disabled  
SNMP agent: enabled

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

## 30 RMON

### 30.1

RMON

- ' **rmon collection stats** *index* [**owner** *owner-string*]
- ' **rmon collection history** *index* [**owner** *owner-string*] [**buckets** *bucket-number*] [**interval** *seconds*]
- ' **rmon alarm** *number* *variable* *interval* {**absolute** | **delta** }  
**rising-threshold** *value* [*event-number*] **falling-threshold** *value*  
[*event-number*] [**owner** *ownername*]
- ' **rmon event** *number* [**log**] [**trap** *community*] [*description-string*]
- ' **show rmon statistics**
- ' **show rmon history**
- ' **show rmon events**
- ' **show rmon alarms** *ion stat*/TT2 1 TfTf0 Tc 0 Tw 11.697 0 Td( )

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

### 30.1.2 rmon collection history

**no**

**rmon collection history** *index* [**owner** *ownername*] [**buckets** *bucket-number*] [**interval** *seconds*]  
**no rmon collection history** *index*

RGOS

owner buckets interval

1

```
Ruijie(config)# interface fast-Ethernet 0/1
Ruijie(config-if)# rmon collection history 1 zhansan
buckets 10 interval 10
```

**rmon alarm** *number variable interval {absolute | delta }  
 rising-threshold value [event-number] falling-threshold value  
 [event-number] [owner ownername]  
 no rmon alarm number*

RGOS

variable interval absolute/delta owner interval  
 rising-threadhold/falling-threadhold event

MIB ifInNUcastPkts.6

Ruijie(config)# **rmon alarm** 10 1.3.6.1.2.1.2.2.1.12.6 30  
**delta rising-threshold** 20 1 **falling-threshold** 10 1 **owner**  
 zhangsan

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

community-type Description-string TT0 1 Tf 0 Tc (l)Tj /T 0.0022 Tc 7.611 0 Td (l)Tj /C2

trap

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

| <b>rmon alarm</b> <i>number variable interval</i><br>{ <b>absolute</b>   <b>delta</b> } <b>rising-threshold</b> <i>value</i><br>[ <i>event-number</i> ] <b>falling-threshold</b> <i>value</i><br>[ <i>event-number</i> ] [ <b>owner</b> <i>ownername</i> ] |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|

## 30.2

### 30.2.1 show rmon statistics

**show rmon statistics**

```
Ruijie# show rmon statistics
Statistics : 1
Data source : Gi1/1
DropEvents : 0
Octets : 1884085
Pkts : 3096
BroadcastPkts : 161
MulticastPkts : 97
CRCAlignErrors : 0
UndersizePkts : 0
OversizePkts : 1200
```

```

Fragments : 0
Jabbers : 0
Collisions : 0
Pkts64Octets : 128
Pkts65to127Octets : 336
Pkts128to255Octets : 229
Pkts256to511Octets : 3
Pkts512to1023Octets : 0
Pkts1024to1518Octets : 1200
Owner : zhangsan
    
```

|                                                                   |  |
|-------------------------------------------------------------------|--|
|                                                                   |  |
| <b>rmon collection stats</b> <i>index</i><br>[owner owner-string] |  |

### 30.2.2 show rmon history

**show rmon history**

```

Ruijie# show rmon history
Entry : 1
Data source : Gil/1
Buckets requested : 65535
Buckets granted : 10
Interval : 1
Owner : zhangsan
Sample : 198
Interval start : 0d:0h:15m:0s
DropEvents : 0
Octets : 67988
    
```

```

Pkts : 726
BroadcastPkts : 502
MulticastPkts : 189
CRCAlignErrors : 0
UndersizePkts : 0
OversizePkts : 0
Fragments : 0
Jabbers : 0
Collisions : 0
Utilization : 0
    
```

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

### 30.2.3 show rmon alarm

**show rmon alarm**

```

Ruijie# show rmon alarm
Event : 1
Description : firstevent
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

|                                                                                                                                                                                                                                                     |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|                                                                                                                                                                                                                                                     |  |
| <b>rmon alarm</b> <i>number variable interval</i><br>{ <b>absolute   delta</b> } <b>rising-threshold</b> <i>value</i><br>[ <i>event-number</i> ] <b>falling-threshold</b> <i>value</i><br>[ <i>event-number</i> ] [ <b>owner</b> <i>ownername</i> ] |  |

### 30.2.4 show rmon event

**show rmon event**

```
Ruijie# show rmon event
Alarm : 1
Interval : 1
Variable : 1.3.6.1.2.1.4.2.0
Sample type : absolute
Last value : 64
Startup80n-4 T22o Tw 0 Td[(fall.44 1.3.6.1.2.1.4.2.0 FTc 2.0 Td[ (
```

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

# 31 IPFIX

## 31.1 IPFIX

### 31.1.1 cache

IPFIX , **cache**  
no

**cache** {**entries** number | **timeout** {**active** minutes | **inactive** seconds}}

**no cache** {**entries** | **timeout** {**active** | **inactive**}}

**entries** *number*

1024 131072.

**timeout**

**active** *minutes*

1 60

30

**inactive** *seconds*

10 600

15

4096

30

15

IPFIX

IPFIX

```

Ruijie(config)# ip flow-aggregation cache
protocol-port
Ruijie(config-flow-cache)# cache entries 2046
Ruijie(config-flow-cache)# cache timeout inactive 199
Ruijie(config-flow-cache)# cache timeout active 45
Ruijie(config-flow-cache)# enabled

```

| show ip flow cache             |  |
|--------------------------------|--|
| show ip flow cache aggregation |  |

### 31.1.2 cache-timeout

top-talker

**cache-timeout** *milliseconds*

**no cache-timeout**

*milliseconds* top-talker 1 ~ 3,600,000 1  
1

5,000ms

top-talker

top-talker

```
Ruijie(config-flow-top-talkers)#cache-timeout 300
```

### 31.1.3 clear ip flow stats

**clear ip flow stats**

```

flow IP IPFIX show ip cache
clear ip flow stats

```

```

Ruijie# clear ip flow stats

```

|                                |  |
|--------------------------------|--|
|                                |  |
| show ip flow cache             |  |
| show ip flow cache aggregation |  |

### 31.1.4 enabled (aggregation cache)

```

IPFIX enabled
no
enabled
no enabled

```

IPFIX

IPFIX

**protocol-port** :

```
Ruijie(config)# ip flow-aggregation cache
protocol-port
Ruijie(config-flow-cache)# enabled
```

**protocol-port** :

```
Ruijie(config)# ip flow-aggregation cache
protocol-port
Ruijie(config-flow-cache)# no enabled
```

|                                               |  |
|-----------------------------------------------|--|
|                                               |  |
| <b>ip flow-aggregation cache</b>              |  |
| <b>cache</b>                                  |  |
| <b>export destination (aggregation cache)</b> |  |
| <b>mask (IPv4)</b>                            |  |
| <b>show ip flow cache aggregation</b>         |  |

'%%) **export**

IPFIX **export**  
no

**export** {destination [*ip-address* | *hostname*] *udp-port* } | **version** [9|10]  
| **template** [refresh-rate *packets* | **timeout-rate** *minutes*]  
**no export** {destination [*ip-address* | *hostname*] *udp-port*} | **version** |  
**template** [refresh-rate | **timeout-rate**]

**destination** *ip-address* | *hostname* *udp-port*

|                         |              |              |
|-------------------------|--------------|--------------|
| <b>version</b> [9   10] | Version 9    | Netflow V9   |
| version 10              | IETF         | version 10   |
| <b>template</b>         | refresh-rate | timeout-rate |

```

refresh-rate packets
                1 600                20
timeout-rate minutes
                1 3600               10
    
```

```

refresh-rate 20
timeout-rate 10
    
```

IPFIX

```

                                IPFIX
destination                                export
    
```

protocol-port

```

Ruijie(config)# ip flow-aggregation cache
protocol-port
Ruijie(config-flow-cache)# export destination
10.41.41.1 9992
Ruijie(config-flow-cache)# export destination
172.16.89.1 9992
Ruijie(config-flow-cache)# enabled
    
```

protocol-port

```

Ruijie(config)# ip flow-aggregation cache
protocol-port
Ruijie(config-flow-cache)# export template
refresh-rate 100
Ruijie(config-flow-cache)# export template
timeout-rate 120
Ruijie(config-flow-cache)# enabled
    
```

|                                  |  |
|----------------------------------|--|
|                                  |  |
| <b>ip flow-aggregation cache</b> |  |
| <b>cache</b>                     |  |

**export destination  
(aggregation cache)**

```
Ruijie(config)# interface gi 2/2
Ruijie(config-if)# flow-sampler my_sampler
Ruijie(config-if)# exit
```

|                               |  |
|-------------------------------|--|
|                               |  |
| <b>flow-sampler-map</b>       |  |
| <b>mode random one-out-of</b> |  |

### 31.1.7 flow-sampler-map

no

**flow-sampler-map** *sampler-map-name*

**no flow-sampler-map** *sampler-map-name*

*sampler-map-name*

**egress** IPFIX **ip flow ingress** **ip flow**  
 ingress service-policy

**ip flow** {**ingress** | **egress**}

**flow-sampler**

**service-policy**

2/2

```
Ruijie# config terminal
Ruijie(config)# flow-sampler-map my_sampler
Ruijie(config-sampler)# mode random one-out-of 666
Ruijie(config-sampler)# exit
Ruijie(config)# interface gi 2/2
```

```
Ruijie(config-if)# flow-sampler my_sampler
Ruijie(config-if)# exit
```

|                               |  |
|-------------------------------|--|
|                               |  |
| <b>flow-sampler</b>           |  |
| <b>mode random one-out-of</b> |  |

### 31.1.8 ip flow egress

**ip flow egress**

no

**ip flow egress**

**no ip flow egress**

IPFIX

ip flow egress ip flow Ingress IPFIX

1/1 IP

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

```
Ruijie(config-if)# ip flow egress
```

|                                                   |  |
|---------------------------------------------------|--|
|                                                   |  |
| <b>ip flow-aggregation<br/>cache</b>              |  |
| <b>cache</b>                                      |  |
| <b>export destination<br/>(aggregation cache)</b> |  |



## ip flow-aggregation cache

no

no enabled

```
ip flow-aggregation cache { as | as-tos | destination-prefix |
destination-prefix-tos | prefix | prefix-port | prefix-tos |
protocol-port | protocol-port-tos | source-prefix |
source-prefix-tos}
```

```
no ip flow-aggregation cache { as | as-tos | destination-prefix |
destination-prefix-tos | prefix | prefix-port | prefix-tos |
protocol-port | protocol-port-tos | source-prefix |
source-prefix-tos}
```

as AS

as-tos AS-Tos

destination-prefix destination-prefix

destination-prefix-tos destination-prefix-tos

prefix prefix

prefix-port prefix-port

prefix-tos prefix-tos

protocol-port protocol-port

protocol-port-tos protocol-port-tos

source-prefix source-prefix

source-prefix-tos source-prefix-tos

|                    |   |  |       |     |               |
|--------------------|---|--|-------|-----|---------------|
|                    |   |  | IPFIX |     | <b>export</b> |
| <b>destination</b> |   |  |       |     | Tos           |
|                    |   |  |       | Tos | Tos           |
| IP                 | 8 |  | IP    |     |               |

prefix prefix-port prefix-tos source-prefix  
source-prefix-tos

prefix prefix-port prefix-tos destination-prefix  
destination-prefix-tos

prefix

### 31.1.11 ip flow-cache entries

ip flow-cache entries

no

ip flow-cache entries *number*

no ip flow-cache entries

*Number* 1024 580000.

65536 (64K)

65536 (64K)

580000 show ip cache flow

|                               |       |
|-------------------------------|-------|
| <b>ip flow egress</b>         |       |
| <b>ip flow-cache timeout</b>  |       |
| <b>show ip flow interface</b> | IPFIX |

### 31.1.12 ip flow-cache timeout

**ip flow-cache timeout**  
**no**

**ip flow-cache timeout** [**active** *minutes* | **inactive** *seconds*]

**no ip flow-cache timeout** [**active** | **inactive**]

**active** *minutes*

1 60

30

**inactive** *seconds*

10 600

15

30

15

```
Ruijie(config)# ip flow-cache timeout active 20
```

```
Ruijie(config)# ip flow-cache timeout inactive 10
```



**refresh-rate** *packets*

1 600

20 **-eets**

|                               |       |
|-------------------------------|-------|
|                               |       |
| <b>ip flow ingress</b>        |       |
| <b>ip flow egress</b>         |       |
| <b>ip flow-cache timeout</b>  |       |
| <b>show ip flow cache</b>     |       |
| <b>show ip flow interface</b> | IPFIX |

### 31.1.14 ip flow-top-talkers

**ip flow-top-talker**

top talker

**ip flow-top-talkers**

**no ip flow-top-talkers**

top talker

**top number sort-by**

**[bytes | packets]**

**no**

**top-talker**

Ruijie(config)#**ip flow-top-talkers**

### 31.1.15 mask (IPv4)

**mask**

**no**

**mask** {[destination | source] minimum *value*}

**no mask** {[destination | source] minimum }

**destination**

**source**

**minimum**

*value* 1 32

0 mask

IP

' ( )

' TOS ( )

' ( )

' Prefix-port ( )

' Prefix-TOS ( )

' Source prefix ( )

' Source prefix TOS ( )

|                               |       |
|-------------------------------|-------|
|                               |       |
| <b>ip flow ingress</b>        |       |
| <b>ip flow egress</b>         |       |
| <b>ip flow-cache timeout</b>  |       |
| <b>show ip flow cache</b>     |       |
| <b>show ip flow interface</b> | IPFIX |

### 31.1.16 match

top-talker

no

**match** { **byte-range** {*max-byte-number min-byte-number* | **max** *max-byte-number* | **min** *min-byte-number*} | **destination** {**address** *ip-address* [*mask* | */nn*] | **as** *as-number* | **port** {*max-port-number min-port-number* | **max** *max-port-number* | **min** *min-port-number*}} | **direction** {**egress** | **ingress**} | **input-interface** *interface-type interface-number* | **nexthop-address** *ip-address* [*mask* | */nn*] | **output-interface** *interface-type interface-number* | **packet-range** {*max-packets min-packets* | **max** *max-packets* | **min** *min-packets*} | **protocol** {*protocol-number* | **tcp** | **udp**} | **source** {**address** *ip-address* [*mask* | */nn*] | **as** *as-number* | **port** {*max-port-number min-port-number* | **max** *max-port-number* | **min** *min-port-number*}} | **tos** {*tos-byte* | **dscp** *dscp* | **precedence** *precedence*}}

**no match** { **byte-range** | **destination** [**address** | **as** | **port**] | **direction** | **flow-sampler** | **input-interface** | **nexthop-address** | **output-interface** | **packet-range** | **protocol** | **source** [**address** | **as** | **port**] | **tos**}

**byte-range** IP

*max-byte-number*

*min-byte-number*

IP

1–4294967295

**max** *max-byte-number* IP

1–4294967295

**min** *min-byte-number* IP

1–4294967295

**destination** {**address** *ip-address* [*mask* | */nn*] | **as** *as-number* | **port** {*max-port-number min-port-number* | **max** *max-port-number* | **min** *min-port-number*}}

**destination address** IP

---

*ip-address* IP  
*mask* IP 10 255.255.255.0  
*/nn* CIDR IP mask 255.255.255.0  
/24

**destination as**  
*as-number*

**destination port**  
*max-port-number*  
*min-port-number* 0-65535  
**max** *max-port-number* 0-65535  
**min** *min-port-number* 0-65535

**direction egress**  
**direction ingress**

**input-interface** *interface-type interface-number*

**nexthop-address** IP  
*ip-address* IP  
*mask* IP 10 255.255.255.0  
*/nn* CIDR IP mask 255.255.255.0  
/24

**output-interface** *interface-type interface-number*

**packet-range** IP  
*max-packets*  
*min-packets*  
IP IP 1-4294967295  
**max** *max-packets* IP 1-4294967295  
**min** *min-packets* IP 1-4294967295

**protocol**  
*protocol-number* 0-255

**tcp** tcp  
**udp** udp

**source address** IP  
*ip-address* IP  
*mask* IP 10 255.255.255.0  
*/nn* CIDR IP mask 255.255.255.0  
/24

**source as**

```

as-number
source port
max-port-number
min-port-number
                                0-65535
max max-port-number              0-65535
min min-port-number              0-65535
tos      TOS
tos-byte      tos
dscp dscp      TOS      dscp
precedence precedence      TOS      precedence

```

**sort-by**

```
ip flow-top-talker
```

```
Ruijie(config-flow-top-talks)#match input-interface
fa 0/1
```

**31.1.17 mode(Flow Sampler Configuration)**

```

no
mode random one-out-of packet-interval
packet-interval packet-interval

```

2/2

```
Ruijie# config terminal
Ruijie(config)# flow-sampler-map my_sampler
Ruijie(config-sampler)# mode random one-out-of 666
Ruijie(config-sampler)# exit
Ruijie(config)# interface gi 2/2
Ruijie(config-if)# flow-sampler my_sampler
Ruijie(config-if)# exit
```

|                     |  |
|---------------------|--|
|                     |  |
| <b>flow-sampler</b> |  |

### 31.1.18 sort-by

### 31.1.19 top

top-talker no  
top-talker

**top** *number*

**no top**

*number* top-talker 1-200

top-talker

top

Ruijie(config-flow-top-talks)#**top** 150

## 31.2 IPFIX

### 31.2.1 show flow-sampler

er-7(e2(n)46ae-ename

```
Ruijie# show flow-sampler my_sampler
Sampler : my_sampler, id : 1, packets matched : 10, mode :
random sampling mode
sampling interval is : 666
```

## 31.2.2 show ip flow cache

### show ip flow cache

```
show ip flow cache
```

### IP

```
Ruijie(config)# show ip flow cache
IP Flow Switching Cache, 4456448 bytes
3 active, 65533 inactive, 820628747 added
0 flow alloc failures
Exporting flows to 1.1.15.1 (2057)
820563238 flows exported in 34485239 udp datagrams, 0
failed
Last clearing of statistics 00:00:03
```

| Protocol    | Total     | Flows | Packets | Bytes | Packets |
|-------------|-----------|-------|---------|-------|---------|
| Active(Sec) | Idle(Sec) |       |         |       |         |
| -----       | Flows     | /Sec  | /Flow   | /Pkt  | /Sec    |
| /Flow       | /Flow     |       |         |       |         |
| TCP-BGP     | 71        | 0.0   | 1       | 49    | 0.0     |
| 2.5         | 15.8      |       |         |       |         |
| UDP-other   | 17        | 0.0   | 1       | 328   | 0.0     |
| 15.7        |           |       |         |       |         |
| ICMP        | 18966     | 6.7   | 10      | 28    | 72.9    |
|             |           |       |         |       | 0.1     |

```

22.9
Total:      19054      6.7      10      28      72.9      0.1
22.9

```

```

SrcIf          SrcIPAddress DstIf          DstIPAddress
Pr TOS Flgs Pkts
Port Msk AS          Port Msk AS NextHop
B/Pk Active
Et1/1          52.52.52.1   Fd4/0          42.42.42.1
01 55 10 3748
0000 /8 50          0000 /8 40 202.120.130.2
28 17.8
Et1/2          52.52.52.1   Fd4/0          42.42.42.1
01 CC 10 3568
0000 /8 50          0000 /8 40 202.120.130.2
28 17.8
Et1/2          10.1.3.2     Fd4/0          42.42.42.1
01 C0 10 1124
0000 /0 0           0000 /8 40 202.120.130.2
28 17.8
...

```

|                               |       |
|-------------------------------|-------|
|                               |       |
| <b>clear ip flow stats</b>    |       |
| <b>show ip flow interface</b> | IPFIX |

### 31.2.3 show ip flow cache aggregation

**show ip flow cache aggregation** *mode*

```

show ip flow cache aggregation { as | as-tos | destination-prefix |
destination-prefix-tos | prefix | prefix-port | prefix-tos |
protocol-port | protocol-port-tos | source-prefix |
source-prefix-tos}

```

**as**

**destination-prefix-tos** TOS

**prefix**

**prefix-port**

**prefix-tos** TOS

**protocol-port**

**protocol-port-tos** TOS

**source-prefix**

**source-prefix-tos** TOS

IP

```
Ruijie# sh ip flow cache aggregation protocol-port
IP Flow Switching Cache, 278544 bytes
2 active, 4094 inactive, 102 added
0 flow alloc failures
```

| Prot | SrcPort | DstPort | Flows | Pkts | B/Pk | Active |
|------|---------|---------|-------|------|------|--------|
| 0x01 | 0000    | 0000    | 15    | 17K  | 28   | 17.8   |
| 0x01 | 0000    | 0000    | 1     | 3568 | 28   | 17.8   |

## 31.2.4 show ip flow export

**show ip flow export**

**show ip flow export**



Exporting using source IP address 172.16.6.2  
Version 9 flow records  
Template ID = 260  
Template timeout = 120

## IP

```
Ruijie# show ip flow interface
FastEthernet 0/1
ip flow ingress
```

### 31.2.6 show ip flow top-talkers

```
( match)
sort-by
show ip flow top-talkers
```

```
Ruijie# show ip flow top-talkers
SrcIf SrcIPAddress      DstIf  DstIPAddress  Pr SrcP
DstP Bytes
Gi1/1  10.10.18.1           Gi1/2  172.16.10.232  11 00A1
00A1 144K
Gi1/1  10.10.19.1           Gi1/2  172.16.10.2    11 00A2
00A2 144K
Gi1/1  172.30.216.196       Gi1/2  172.16.10.2    06 0077
0077 135K
Gi1/1  10.162.37.71         Gi1/2  172.16.10.2    06 0050
0050 125K
Gi1/1  10.92.231.235        Gi1/2  172.16.10.2    06 0041
0041 115K
5 of 5 top talkers shown. 11 flows processed
```



## VRF

**clear ip route vrf** *vrf-name* { \* | *network* [*mask*]

|                 |     |
|-----------------|-----|
|                 |     |
| <i>vrf-name</i> | VRF |
| *               | VRF |
| <i>network</i>  |     |
| <i>mask</i>     |     |

```
Ruijie# clear ip route vrf redvrf *
```

**show ip route vrf**

RGOS10.1

### 32.1.3 ip vrf

VRF                      VRF                      no

**ip vrf** *vrf-name*

**no ip vrf** *vrf-name*

*vrf-name*                      VRF

VRF

```
Ruijie(config)# ip vrf redvrf
```

RGOS10.1

---

RGOS 10.3(4) S86 E MPLS  
 VRF VRF

### 32.1.4 rd

**rd rd\_value**

vrf rd VRF VRF VRF  
 rd VRF  
 VRF

**rd\_value**

1) rd\_value as\_num nn

an\_num nn

2) rd\_value ip\_addr:nn

ip\_addr IP nn

rd vrf rd

**vrf**

vrf RD RD RD  
 RD vrf RD

vrf RD RD

```
Ruijie(config)# ip vrf vrf1
Ruijie (config-vrf)# rd 100:1
```

|                    |     |
|--------------------|-----|
|                    |     |
| <b>ip vrf</b>      | vrf |
| <b>show ip vrf</b> | vrf |

RGOS10.3(3)

## 32.1.5 route-target

[no] route-target {*import|export|both*} *rt\_value*

vrf rt

*import*

### 32.1.6 ip vrf forwarding

```

VRF;          VRF          no
ip vrf forwarding vrf-name
no ip vrf forwarding vrf-name

vrf-name          VRF

VRF

```

VRF

```

Ruijie(config-if)# ip vrf forwarding redvrf

RGOS10.1

```

### 32.1.7 show ip vrf

```

VRF

show ip vrf [ brief | detail | interfaces ] [ vrf-name ]

brief          VRF
detail         VRF
interfaces     VRF
vrf-name      ( ) VRF

VRF

```

VRF

```

'      brief
'      detail

```



## 33 RIP

### 33.1

#### 33.1.1 address-family RIP

RIP

**address-family****no****address-family ipv4 vrf** *vrf-name***no address-family ipv4 vrf** *vrf-name*

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

RIP

**address-family**

(config-router-af)#

VRF RIP

VRF

RIP

VRF

RIP

**exit-address-family** **exit**

vpn1 VRF

vrf

RIP

Ruijie(config)# **ip vrf vpn1**Ruijie(config-vrf)# **exit**Ruijie(config)# **interface FastEthernet 1/0**Ruijie(config-if)# **ip vrf forwarding vpn1**Ruijie(config-if)# **ip address 192.168.1.1**

```

255.255.255.0
Ruijie(config)# router rip
Ruijie(config-router)# address-family ipv4 vrf vpn1
Ruijie(config-router-af)# network 192.168.1.0
Ruijie(config-router)# exit-address-family

```

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

### 33.1.2 auto-summary (RIP)

```

RIP                               auto-summary
no

```

```

auto-summary
no auto-summary

```

```

RIP
      RIPv1  RIPv2

```

```

RIP

```

```

'      RIP
'      RIP
'

```

```

      RIPv1
      RIPv2

```



```
Ruijie(config-router)# default-metric 3
Ruijie(config-router)# redistribute ospf 100
```

|                     |  |
|---------------------|--|
|                     |  |
| <b>redistribute</b> |  |

### 33.1.4 default-information originate(RIP)

RIP

```
default-information originate no
```

```
default-information originate [always] [metric metric-value]  
[route-map map-name]
```

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

|                                     |                             |
|-------------------------------------|-----------------------------|
|                                     |                             |
| <b>always</b>                       | RIP                         |
| <b>metric</b> <i>metric-value</i>   | <i>metric-value</i><br>1-15 |
| <b>route-map</b><br><i>map-name</i> | route-map ,<br>route-map    |

metric 1

RIP

**default-information originate**

**always** RIP

**show ip rip database** RIP

```

RIP
set metric
metric
route-map set metric
RIP

RIP

ip default-network
default-information originate

RIP
```

]

RIP

---

120

RIP

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 |  |

### 33.1.7 distribute-list out RIP

**distribute-list out no**

**distribute-list** {[*access-list-number* | *name*] | **prefix** *prefix-list-name*}  
**out** [*interface* | *protocol* [*process-id* | *process-name*]]

**no distribute-list** {[*access-list-number* | *name*] | **prefix** *prefix-list-name*}  
**out** [*interface* | *protocol* [*process-id* | *process-name*]]

| <i>access-list-number</i>             |     |
|---------------------------------------|-----|
| <b>prefix</b> <i>prefix-list-name</i> |     |
| <i>interface</i>                      | ( ) |

|                     |                                     |
|---------------------|-------------------------------------|
| <i>protocol</i>     | ( )                                 |
| <i>process-id</i>   | ( ) <i>protocol</i> OSPF<br>OSPF id |
| <i>process-name</i> | ( ) <i>protocol</i> ISIS<br>ISIS    |

RIP

192.168.12.0/24

```

Ruijie(config)# router rip
Ruijie(config-router)# network 200.4.4.0
Ruijie(config-router)# network 192.168.12.0
Ruijie(config-router)# distribute-list 10 out
Ruijie(config-router)# version 2
Ruijie(config)# access-list 10 permit 192.168.12.0
0.0.0.255

```

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

### 33.1.8 exit-address-family

**exit-address-family**

**exit-address-family**

---

**no**

**exit**

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

|                       |  |
|-----------------------|--|
|                       |  |
| <b>address-family</b> |  |

### 33.1.9 ip rip authentication key-chain

```

RIP          RIP          ip rip
authentication key-chain      no
ip rip authentication key-chain name-of-keychain
no ip rip authentication key-chain

```

|                         |     |
|-------------------------|-----|
|                         |     |
| <i>name-of-keychain</i> | RIP |

**key chain**

RIP

RIPv1

RIP

RIPv2

Serial 0

RIP

ripchain

```
Ruijie(config)# interface serial 0/0
```

```
Ruijie(config-if)# ip rip authentication key-chain
ripchain
```

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

### 33.1.10 ip rip authentication mode

RIP

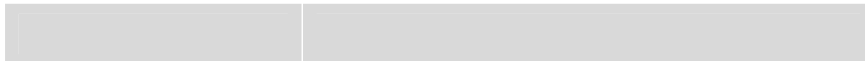
Serial 0

RIP

MD5

```
Ruijie(config)# interface serial 0/0
```

```
Ruijie(config-if)# ip rip authentication mode md5
```



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

### 33.1.12 ip rip default-information

```

                                RIP                               ip rip
default-information             no
ip rip default-information only originate [metric metric-value]
no ip rip default-information

```

|             |  |
|-------------|--|
|             |  |
| <b>only</b> |  |

ethernet0/0

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

| default-information originate | RIP |
|-------------------------------|-----|

### 33.1.13 ip rip receive enable

```
RIP
receive enable      no      RIP      ip rip
                  RIP      RIP      RIP
```

```
ip rip receive enable
no ip rip receive enable
```

RIP

```
no
default            RIP
                  RIP
```

Fastethernet 0/0 RIP

```
Ruijie(config)# interface fastethernet 0/0
Ruijie(config-if)# no ip rip receive enable
```

| ip rip send enable | RIP |
|--------------------|-----|
| passive-interface  | RIP |

### 33.1.14 ip rip receive version

```

RIP
ip rip receive version
no ip rip receive version
RIP
no
ip rip receive version [1] [2]

```

| 1 | RIPv1 |
|---|-------|
| 2 | RIPv2 |

**version**

```

RIP
version
RIPv1 RIPv2
version
Fastethernet 0/0
RIPv1 RIPv2

```

```

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

```

| version | RIP |
|---------|-----|

### 33.1.15 ip rip send enable

```

RIP
send enable
no
RIP
RIP
ip rip
RIP

```

**ip rip send enable**

---

**no ip rip send enable**

RIP

```

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

```

|                              |     |
|------------------------------|-----|
|                              |     |
| <b>ip rip receive enable</b> | RIP |
| <b>passive-interface</b>     | RIP |

### 33.1.16 ip rip send version

```

RIP
ip rip receive version
RIP
no
ip rip send version [1] [2]
no ip rip send version

```

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

**version**



```
Ruijie(config)# interface fastethernet 0/0
Ruijie(config-if)# ip rip v2-broadcast
```

|                |     |
|----------------|-----|
|                |     |
| <b>version</b> | RIP |

### 33.1.18 ip split-horizon (RIP)

```

RIP
no RIP
ip split-horizon
no ip split-horizon

IP

X.25

IP

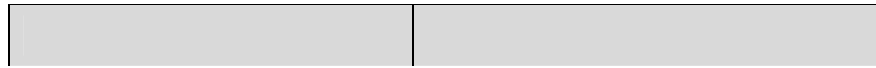
RIP
neighbor
show ip rip
RIP

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

```

RIP

---



neighbor RIP

RIP

|                     |     |
|---------------------|-----|
|                     |     |
| <b>auto-summary</b> | 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

### 33.1.22 offset-list(RIP)

RIP metric  
**offset-list** no offset

**offset-list** *access-list-number* {in | out} *offset* [*interface-type*  
*interface-number*]

**no offset-list** *access-list-number* {in | out} *offset* [*interface-type*  
*interface-number*]

|                         |  |
|-------------------------|--|
| <i>interface-number</i> |  |
|-------------------------|--|

offset

```

RIP
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

```

### 33.1.23 output-delay

---

```

RIP
25
512
25

```

**output-delay**

```

RIP
30

```

```

Ruijie(config)# router rip
Ruijie(config-router)# output-delay 30

```

### 33.1.24 passive-interface

```

passive-interface no

```

```

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

```

|                                     |         |
|-------------------------------------|---------|
|                                     |         |
| <b>default</b>                      | passive |
| <i>interface-type interface-num</i> |         |

```

passive

```

```

passive-interface default passive
no passive-interface intface-type interface-num
passive

```

```

ip rip send enable ip rip receive enable
RIP
passive RIP RIP
enable ip rip send enable ip rip receive

```

```

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

```

| <b>ip rip receive enable</b> | RIP |
|------------------------------|-----|
| <b>ip rip send enable</b>    | RIP |

### 33.1.25 redistribute RIP

```

redistribute
no
redistribute {bgp | isis [process-name] | ospf <1-65535> | connec
ted | static}[metric value ] [route-map route-map-name ][ match i
nternal | external type | nssa-external type ]
no redistribute {bgp | isis [process-name] | ospf <1-65535> |
connected | static}[metric value ] [route-map route-map-name ]
[ match internal | external type | nssa-external type ]

```

| <b>bgp   isis   ospf   connected   static</b> |        |
|-----------------------------------------------|--------|
| <b>metric</b>                                 | metric |
| <b>route-map</b>                              |        |
| <b>match</b>                                  | ospf   |
| <i>process-name</i>                           | ISIS   |
| <1-65535>                                     | OSPF   |

OSPF  
ISIS                    level-2  
                          metric        1  
route-map

RIP

RIP

OSPF



|              |                              |                              |                |
|--------------|------------------------------|------------------------------|----------------|
| <i>flush</i> | <i>flush</i><br><i>Flush</i> | RIP<br><i>invalid</i><br>120 | <i>invalid</i> |
|--------------|------------------------------|------------------------------|----------------|

30 180 120

RIP RIP

RIP **show ip rip**

RIP 10 30  
invalid  
invalid 90

```
Ruijie(config)# router rip
Ruijie(config-router)# timers basic 10 30 90
```

---

2Mbps

---

### 33.1.28 validate-update-source

RIP  
**validate-update-source no**

**validate-update-source**  
**no validate-update-source**

RIP

---

RIP  
RIP

IP

RIPv1 RIPv2

RIPv1

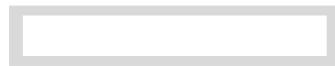
RIP  
**ip rip send version**

**ip rip receive version**  
RIP

RIP 2

Ruijie(config)# **router rip**

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



```

RIP
  rip      rip      metric  distance
VRF      VRF      VRF-id
```

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
```

## 33.2.2 show ip rip database

RIP

**show ip rip database**
**show ip rip database** [**vrf** *vrf-name*] [*network-number* {*network-mask*}]

| <b>vrf</b> <i>vrf-name</i> | VRF RIP |
|----------------------------|---------|
| <i>network-number</i>      |         |
| <i>network-mask</i>        |         |

RIP

RIP

```
Ruijie# show ip rip database
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
```

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
```

|  |  |
|--|--|
|  |  |
|--|--|

|             |  |
|-------------|--|
| show ip rip |  |
|-------------|--|

### 33.2.3 show ip rip external

RIP

show ip rip external

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

|                                               |         |
|-----------------------------------------------|---------|
|                                               |         |
| <b>bgp   connected   isis   ospf   static</b> |         |
| <b>vrf</b> <i>vrf-name</i>                    | VRF RIP |
| <i>process-name</i>                           | ISIS    |
| <1-65535>                                     | OSPF    |

RIP

```
Ruijie# show ip rip external connected
Protocol connected route:
[connected] 1.0.0.0/8 metric=0
nhop=0.0.0.0, if=2
[connected] 3.0.0.0/8 metric=0
nhop=0.0.0.0, if=16391
[connected] 4.4.0.0/16 metric=0
nhop=0.0.0.0, if=16388
[connected] 5.0.0.0/8 metric=0
nhop=0.0.0.0, if=16386
[connected] 192.168.195.0/24 metric=0
nhop=0.0.0.0, if=1
```

|                    |  |
|--------------------|--|
|                    |  |
| <b>show ip rip</b> |  |

### 33.2.4 show ip rip interface

RIP

**show ip rip interface****show ip rip interface [vrf *vrf-name*]**

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

RIP

```

Ruijie# show ip rip interface
FastEthernet 1/1 is down, line protocol is down
  RIP is not enabled on this interface
FastEthernet 1/0 is up, line protocol is up
  Routing Protocol: RIP
  Receive RIPv2 packets only
  Send RIPv2 packets only
  Passive interface: Disabled
  Split horizon: Enabled
  V2 Broadcast: Disabled
  Multicast register: Registered
  Interface Summary Rip:
    Not Configured
  Authentication mode: Text
  Authentication key-chain: ripk1
  Authentication text-password: ruijie
  Default-information: only, metric 5
  IP interface address:
    192.168.64.100/24

```

```

RIP BFD , :
Ruijie#show ip rip interface
VLAN 1 is up, line protocol is up
Routing Protocol: RIP
  Receive RIPv1 and RIPv2 packets
  Send RIPv1 packets only
  Receive RIP packet: Enabled
  Send RIP packet: Enabled
  Send RIP supernet routes: Enabled
  Passive interface: Disabled
  Split horizon: Enabled
  BFD: Enabled
  V2 Broadcast: Disabled
  Multicast registe: Registered
  Interface Summary Rip:
    Not Configured
  IP interface address:
2.2.2.111/24
```

RIP

---

RIP

Ruijie#

# 34 OSPF

## 34.1

### 34.1.1 area

```

no OSPF
area area-id
no area area-id
    
```

|            |              |
|------------|--------------|
| '          | '            |
| ' UfYU! ]X | ' CGD:<br>ID |

OSPF

```

no OSPF
area authentication area default-cost area filter-list
area nssa
    
```

OSPF

1.

2. network area

OSPF 2

```

Ruijie(config)# router ospf 2
Ruijie(config)# no area 2
    
```

|                |                |
|----------------|----------------|
| '              | '              |
| ' bYhkcf_ UfYU | ' CGD:<br>CGD: |

### 34.1.2 area authentication

OSPF **area authentication**  
**no** OSPF  
**area area-id authentication [message-digest]**  
**no area area-id authentication**

|                      |                              |
|----------------------|------------------------------|
| '                    | '                            |
| ' UfYU! ]X           | ' CGD:<br>I D                |
| ' aYggU[ Y! X] [ Ygh | ' A8) aYggU[ Y<br>X] [ Ygh ) |

RGOS  
 OSPF OSPF  
 MD5 **message-digest**  
**message-digest**  
 OSPF  
**ospf authentication-key** **ip**  
**message-digest-key** MD5 **ip ospf**

```

          OSPF              0              MD5
    backbone

```

```

Ruijie(config)# interface FastEthernet 0/0
Ruijie(config-if)# ip address 192.168.12.1
255.255.255.0
Ruijie(config-if)# ip ospf message-digest-key 1 md5
backbone

```

```
# OSPF
```

```

Ruijie(config)# router ospf 1
Ruijie(config-router)# network 192.168.12.0
0.0.0.255 area 0
Ruijie(config-router)# area 0 authentication
message-digest

```

|                                        |                        |
|----------------------------------------|------------------------|
|                                        |                        |
| <pre> ]d Ui h\Ybh] W h] cb! _Ym </pre> | <pre> cgdZ CGD: </pre> |

|             |      |      |
|-------------|------|------|
| <i>cost</i> | STUB | NSSA |
|-------------|------|------|

```

                ABR
            STUB                NSSA                ABR
                ABR

    OSPF                STUB    NSSA                area
stub area nssa area default-cost                STUB
                area stub                NSSA                area
nssa area default-cost                ABR
    
```

50

```

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

|              |             |
|--------------|-------------|
| '            | '           |
| ' UfYU ghi V | ' CGD.      |
| ' UfYU bggU  | ' CGD. BGG5 |

### 34.1.4 area filter-list

ABR

intra-area

**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> |  |

OSPF                    nssa                    area nssa  
 no                    nssa                    nssa

**area** *area-id* **nssa** [ **no-redistribution**] [**default-information-originate**  
 [**metric** <0-16777214> | **metric-type** <1-2>]] [**no-summary**]  
**no area** *area-id* **nssa** [ **no-redistribution**][**default-information-originate**]  
 [**no-summary**]

|                                          |                                                |
|------------------------------------------|------------------------------------------------|
| '                                        | '                                              |
| ' UfYU ] X                               | ' BGG5                                         |
| ' bc! fYX] ghf ] Vi h] cb                | '<br>bggU 56F<br><br>bggU                      |
| ' XYZU ` h! ] bZcf aUh] cb! cf] [ ] bUhY | '<br>+ @G5            bggU<br>BGG5 56F<br>5G6F |
| ' bc! gi aaUfm                           | '<br>bggU<br>f156Fk<br>@G5            bggU     |

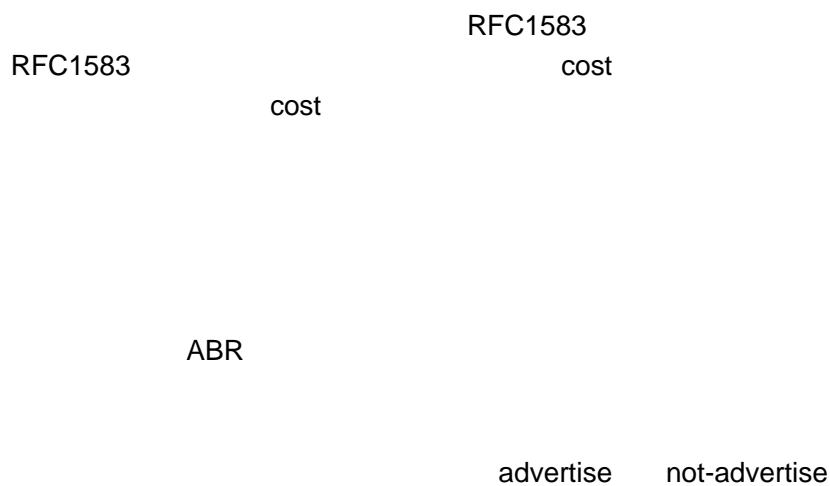
NSSA

**default-information-originate**                    Type-7 LSA  
 nssa    ABR    ASBR                    ABR

Type-7 LSA

|                          |            |      |      |
|--------------------------|------------|------|------|
|                          | NSSA       |      | LSA  |
| ABR                      | no-summary | ABR  | NSSA |
| summary LSAs             | Type-3 LSA |      |      |
| <b>area default-cost</b> |            | NSSA | ABR  |

|                                  |  |
|----------------------------------|--|
| <i>ip-address</i>                |  |
| <b>advertise   not-advertise</b> |  |
| <b>cost cost</b>                 |  |



OSPF

172.16.16.0/20

```
Ruijie(config)# router ospf 1
Ruijie(config-router)# network 172.16.0.0 0.0.15.255
area 0
Ruijie(config-router)# network 172.16.17.0 0.0.15.255
area 1
Ruijie(config-router)# area 1 range 172.16.16.0 255.255.240.0
```

### 34.1.7 area stub

OSPF

**area stub no**

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

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

| <i>area-id</i>    | STUB    |
|-------------------|---------|
| <b>no-summary</b> | ABR ABR |

OSPF

**area stub ABR**

```
Ruijie(config-router)# area 1 stub
```

|                                                    |                                                   |
|----------------------------------------------------|---------------------------------------------------|
| <b>authentication-key</b> <i>key</i>               | OSPF<br>service password-encryption               |
| <b>message-digest-key</b><br><i>key-id md5 key</i> | OSPF MD5<br>MD5<br>service<br>password-encryption |
| <b>authentication</b>                              |                                                   |
| <b>message-digest</b>                              | MD5                                               |
| <b>null</b>                                        |                                                   |

```

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

```

OSPF

ABR Stub Area      NSSA      ABR

```

router-id OSPF
show ip ospf neighbor

```

```

router-id
Loopback

```

```

area virtual-link
OSPF

```

**area authentication**

1

2.2.2.2

```
Ruijie(config)# router ospf 1
Ruijie(config-router)# network 172.16.0.0 0.0.15.255 area 0
Ruijie(config-router)# network 172.16.17.0 0.0.15.255area 1
    Ruijie(config-router)# area 1 virtual-link 2.2.2.2

    Ruijie(config)# router ospf 1                                À
    Ruijie(config-router)# network 172.16.17.0 0.0.15.255area 1
    Ruijie(config-router)#
```





Ruijie(config-router)# **no compatible rfc1583**

|                     |      |
|---------------------|------|
|                     |      |
| <b>show ip ospf</b> | ospf |

### 34.1.12 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*] [metric-type *type*] [route-map *map-name*]

|                                  |                            |
|----------------------------------|----------------------------|
|                                  |                            |
| <b>always</b>                    | OSPF                       |
| <b>metric <i>metric</i></b>      | 1                          |
| <b>metric-type <i>type</i></b>   | OSPF<br>1<br>2<br>1 2<br>2 |
| <b>route-map <i>map-name</i></b> | route-map ,<br>route-map   |

```

redistribute      default-information      OSPF
ASBR
OSPF
default-information originate

always          OSPF

show ip ospf database      OSPF
0.0.0.0                    OSPF
show ip route

default-information originate
default-metric

OSPF                      1                      2
1          1          2          show ip route
1

STUB

OSPF                      OSPF
1          50

Ruijie(config)# router ospf 1
Ruijie(config-router)# network 172.16.24.0 0.0.0.255
area 0
Ruijie(config-router)# default-information originate
always metric 50 metric-type 1
    
```

|                       |      |
|-----------------------|------|
|                       |      |
| show ip ospf database | OSPF |
| show ip route         | IP   |

### 34.1.13 default-metric

```

OSPF
default-metric      no
    
```

**default-metric** *metric*

**no default-metric**

|               |      |
|---------------|------|
|               |      |
| <i>metric</i> | OSPF |

20

**default-metric**

**redistribute**

**default-metric**

**default-information originate**

OSPF

OSPF

50

```
Ruijie(config)# router rip
Ruijie(config-router)# network 192.168.12.0
Ruijie(config-router)# version 2
Ruijie(config-router)# exit
Ruijie(config)# router ospf
Ruijie(config-router)# network 172.16.10.0 0.0.0.255
area 0
Ruijie(config-router)# default-metric 50
Ruijie(config-router)#redistribute rip subnets
```

|                     |      |
|---------------------|------|
|                     |      |
| <b>redistribute</b> |      |
| <b>show ip ospf</b> | ospf |

### 34.1.14 distance ospf

OSPF

**distance ospf** {intra-area <1-255> | inter-area <1-255> | external <1-255>}

**no distance ospf**

| <b>intra-area &lt;1-255&gt;</b> | 110 |
|---------------------------------|-----|
| <b>inter-area &lt;1-255&gt;</b> | 110 |
| <b>external &lt;1-255&gt;</b>   | 110 |

110

OSPF

OSPF

OSPF

160

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

```
Ruijie(config-router)# distance ospf external 160
```

### 34.1.15 distribute-list in

LSA

**distribute-list** {listname | gateway plist-name | prefix plist-name }  
**in** [interface-type num]

**no distribute-list** {listname | gateway plist-name | prefix plist-name }  
**in** [interface-type num]

|                                  |             |
|----------------------------------|-------------|
|                                  |             |
| <i>listname</i>                  | acl         |
| <b>gateway</b> <i>plist-name</i> | gateway     |
| <b>prefix</b> <i>plist-name</i>  | prefix-list |
| <b>interface-type</b> <i>num</i> | LSA         |



```
Ruijie(config)# access-list 3 permit 172.16.0.0
0.0.127.255
Ruijie(config)# router ospf 25
Ruijie(config-router)# redistribute rip metric 100
Ruijie(config-router)# distribute-list 3 in ethernet
1/0
Ruijie(config-router)# distribute-list 3 in ethernet
1/1
```

### 34.1.16 distribute-list out

```

redistribute
distribute-list {listname | gateway plist-name | prefix plist-name}
  
```

---

**out** [**bgp** | **connected** | **isis** *area-tag* | **ospf** *process-id*] **rip** | **static**]

| <i>listname</i>                  | acl         |
|----------------------------------|-------------|
| <b>gateway</b> <i>plist-name</i> | gateway     |
| <b>prefix</b> <i>plist-name</i>  | prefix-list |

[**bgp** | **connected** | **isis**  
*area-tag* | **ospf**  
*process-id* | **rip**



```

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]]
    
```



|                     |                                                                                                                                                                                                                                          |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>error</b></p> | <p>error traps<br/>error traps<br/><b>ifauthfailure</b><br/><b>ifconfigerror</b><br/><b>ifrxbadpacket</b><br/><b>virtifauthfailu</b><br/><b>re</b><br/><b>virtifconfigerr</b><br/><b>or</b><br/><b>virtifrxbadpac</b><br/><b>ket</b></p> |
|                     | <p>34-23</p>                                                                                                                                                                                                                             |

|            |                                                                                                                                |
|------------|--------------------------------------------------------------------------------------------------------------------------------|
| <b>lsa</b> | lsa traps<br>lsa traps<br><b>lsdbapproach<br/>overflow</b><br><br><b>lsdboverflow</b><br><br><b>maxagelsa<br/>originatelsa</b> |
|            | 34-24                                                                                                                          |

L

|                   |                                                                                                     |
|-------------------|-----------------------------------------------------------------------------------------------------|
| <b>retransmit</b> | retransmit traps<br>retransmit traps<br><b>ifxretransmit</b><br><b>virtifxretrans</b><br><b>mit</b> |
|-------------------|-----------------------------------------------------------------------------------------------------|

|                            |                                                                                                                                                                                                            |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>state-change</b></p> | <p>state-change traps<br/> state-change traps<br/> <b>ifstatechange</b><br/> <b>nbrstatechang</b><br/> <b>e</b><br/> <b>virtifstatechan</b><br/> <b>ge</b><br/> <b>virtnbrstatech</b><br/> <b>ange</b></p> |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

TRAP

**snmp-server**  
**enable traps ospf**

MIB

**snmp-server**

TRAP

OSPFv2 100 TRAP

Ruijie(config)# **router ospf 100**Ruijie(config)# **enable traps**

| <b>show ip ospf</b>       | OSPF       |
|---------------------------|------------|
| <b>enable mib-binding</b> | OSPFv2 MIB |

### 34.1.19

```
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 |

### 34.1.20 ip ospf authentication-key

```
OSPF ip ospf
authentication-key no
ip ospf authentication-key key
no ip ospf authentication-key
```

|     |   |
|-----|---|
|     |   |
| Key | 8 |

ip ospf authentication-key

OSPF  
OSPF

OSPF

```

                OSPF                100Mbps/Bandwidth    Bandwidth
                bandwidth

                OSPF
'   64K          cost  1562
'   E1          cost   48
'   10M         cost   10
'   100M        cost

ip ospf cost          OSPF

                serial 1/0        OSPF          100

Ruijie(config)# interface serial 1/0
Ruijie(config-if)# ip ospf cost 100

```

|  |  |
|--|--|
|  |  |
|--|--|

, 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
```

### 34.1.23 ip ospf dead-interval

```
OSPF ip
ospf dead-interval no
ip ospf dead-interval seconds
no ip ospf dead-interval
```

|                |  |
|----------------|--|
|                |  |
| <i>seconds</i> |  |

**ip ospf hello-interval**

```

OSPF          Hello          OSPF
              Hello
              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
    
```

|                               |            |
|-------------------------------|------------|
|                               |            |
| <b>ip ospf hello-interval</b> | OSPF Hello |

### 34.1.24 ip ospf disable all

```

ospf
ip ospf disable all
no ip ospf disable all
    
```

**network area**

serial 1/0 OSPF Hello

15

```
Ruijie(config)# interface serial 1/0
Ruijie(config-if)# ip address 172.16.10.1
255.255.255.0
Ruijie(config-if)# encapsulation ppp
Ruijie(config-if)# ip ospf hello-interval 15
```

|                              |      |
|------------------------------|------|
|                              |      |
| <b>ip ospf dead-interval</b> | OSPF |

### 34.1.26 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> | 255 |

MD5

**ip ospf message-digest-key**

OSPF  
OSPF

OSPF  
**authentication**

**area**

**ip ospf authentication**

RGOS

MD5

OSPF MD5

OSPF

FastEthernet 0/0

OSPF

hello5

```
Ruijie(config)# interface Serial 1/0
Ruijie(config-if)# ip address 172.16.24.2
255.255.255.0
Ruijie(config-if)# ip ospf authentication
message-digest
Ruijie(config-if)# ip ospf message-digest-key 10 md5
hello10
Ruijie(config-if)# ip ospf message-digest-key 5 md5
hello5
```

```
Ruijie(config)# interface Serial1/0
Ruijie(config-if)# no ip ospf message-digest-key 10 md5
hello10
```

|                               |      |
|-------------------------------|------|
|                               |      |
| <b>area authentication</b>    | OSPF |
| <b>ip ospf authentication</b> |      |

### 34.1.27 ip ospf mtu-ignore

```

no
ip ospf mtu-ignore
no ip ospf mtu-ignore
    
```

|  |  |
|--|--|
|  |  |
|  |  |

mtu

```

OSPF
MTU
    ,
    MTU,
    ,
    MTU
    MTU
    
```

serial 1/0 MTU

```

Ruijie(config)# interface serial 1/0
Ruijie(config-if)# ip ospf mtu-ignore
    
```

### 34.1.28 ip ospf network

```

OSPF
no
ip ospf network broadcast non-broadcast point-to-multipoint
oint [ non-broadcast ] point-to-point
    
```

|                                                |                      |
|------------------------------------------------|----------------------|
|                                                |                      |
| <b>broadcast</b>                               | OSPF                 |
| <b>non-broadcast</b>                           | OSPF<br>NBMA         |
| <b>point-to-multipoint<br/>[non-broadcast]</b> | OSPF , non-broadcast |
| <b>point-to-point</b>                          | OSPF                 |

' PPP SLIP X.25  
 ' NBMA X.25  
 '  
 '  
 OSPF  
 ' FDDI  
 ' X.25  
 ' HDLC PPP SLIP  
 OSPF  
 ' (NBMA) NBMA SVC  
 X.25 PVC  
 OSPF NBMA  
 Designated Router NBMA  
 '  
 OSPF  
 OSPF  
 ,

|                        |      |                 |
|------------------------|------|-----------------|
|                        | X.25 | OSPF            |
|                        |      | <b>X.25 map</b> |
| <b>frame-relay map</b> | X.25 |                 |
| OSPF                   | X.25 |                 |
|                        |      | OSPF            |
| ,                      |      |                 |
| ,                      |      |                 |
|                        | X.25 | IP              |
| broadcast              | .    |                 |

```
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)# 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
```

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
```





fastethernet 0/0 0

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

Ruijie(config-if)# **ip ospf priority 0**

|                        |      |
|------------------------|------|
|                        |      |
| <b>ip ospf network</b> | OSPF |

### 34.1.30 ip ospf retransmit-interval

LSU

**ip ospf retransmit-interval no**

**ip ospf retransmit-interval seconds**

**no ip ospf retransmit-interval**

|                |       |
|----------------|-------|
|                |       |
| <i>Seconds</i> | LSU 5 |

5

LSU LSU

**ip ospf retransmit-interval**

LSA

LSU

area

virtual-link

retransmit-interval

serial 1/0      LSU      10

```
Ruijie(config)# interface serial 1/0
Ruijie(config-if)# ip ospf retransmit-interval 10
```

|                   |      |
|-------------------|------|
|                   |      |
| area virtual-link | OSPF |

### 34.1.31 ip ospf transmit delay

```
OSPF      LSU      ip ospf
transmit delay      no
ip ospf transmit delay seconds
no ip ospf transmit delay
```

|         |                    |
|---------|--------------------|
|         |                    |
| Seconds | OSPF      LSU<br>1 |

1

```
LSU      LSAs      Age
ip ospf transmit delay
LSU      area
virtual-link      retransmit-interval
RGOS      Age      3600      LSA
LSA
```

serial1/0 5

```
Ruijie(config)# interface serial 1/0
Ruijie(config-if)# ip ospf transmit delay 10
```

|                   |      |
|-------------------|------|
|                   |      |
| area virtual-link | OSPF |

### 34.1.32 log-adj-changes

no default

```
log-adj-changes [detail]
no log-adj-changes [detail]
```

|        |  |
|--------|--|
|        |  |
| detail |  |

Full detail Full

```
Ruijie(config)# router ospf 1
Ruijie(config-router)# log-adj-changes detail
```

|  |  |
|--|--|
|  |  |
|--|--|

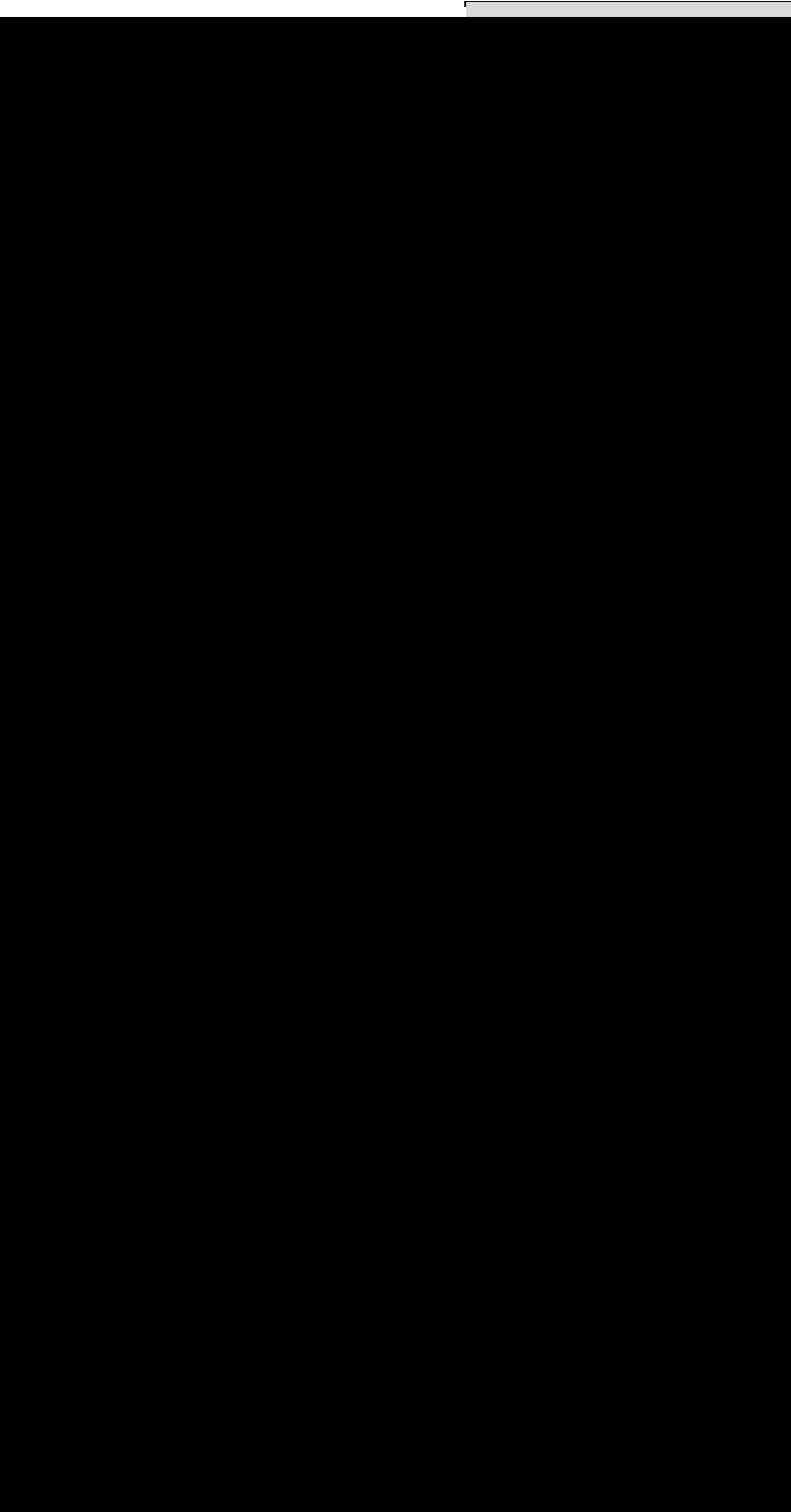
|                           |
|---------------------------|
| <code>show ip ospf</code> |
|---------------------------|

|                   |
|-------------------|
| <code>ospf</code> |
|-------------------|

### 34.1.33 max-concurrent-dd

DD

`max-concurrent-dd <1-65535>`



```
cost]
no neighbor ip-address
```

|                                        |                                              |
|----------------------------------------|----------------------------------------------|
|                                        |                                              |
| <i>ip-address</i>                      | IP                                           |
| <b>poll-interval</b><br><i>seconds</i> | 120<br>Non-broadcast(NBMA)                   |
| <b>priority</b><br><i>priority</i>     | Non-broadcast(NBMA)                          |
| <b>Cost cost</b>                       | , cost point-to-multipoint [ non-broadcast ] |

```
RGOS
IP                               IP
    NBMA
        Hello    OSPF                Hello    Hello
            0        Hello            OSPF        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
```



```

                                OSPF    network    IP
                                OSPF
                                0 1 172.16.16.0    IP
192.168.12.0/24                    1
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

```

|                    |      |
|--------------------|------|
|                    |      |
| <b>router ospf</b> | OSPF |

### 34.1.36 overflow database

```

                                OSPF    LSA
overflow database <0-4294967294> hard | soft
no overflow database

```

|                    |                           |
|--------------------|---------------------------|
|                    |                           |
| <1-4294967294>     | LSA                       |
| <b>hard   soft</b> | hard LSA OSPF<br>soft LSA |

OSPF                      **hard**                      OSPF  
**soft**

LSA      10                      OSPF 10

```

Ruijie# config terminal
Ruijie(config)# router ospf 10
Ruijie(config-router)# overflow database 10 hard
    
```

### 34.1.37 overflow database external

external LSA

**overflow database external** *max-dbsize wait-time*  
**no overflow database external**

| <i>max-dbsize</i> | external lsa                      AS<br><br>0-2147483647 |
|-------------------|----------------------------------------------------------|
| <i>wait-time</i>  | 0-65535                                                  |

external-LSA

external-LSA

external-LSA

```

external-LSA          max-dbsize
external-LSA          external-LSA
wait-time             external-LSA
    
```

```

Ruijie# config terminal
Ruijie(config)# router ospf 10
Ruijie(config-router)# overflow database external 10 3
    
```

### 34.1.38 overflow memory-lack

```

                OSPF    OVERFLOW
no
overflow memory-lack
no overflow memory-lack
    
```

|    |               |
|----|---------------|
|    |               |
| no | OVERFLOW OSPF |

```

                OSPF    OVERFLOW
    
```

```

OSPF    OVERFLOW
    
```

```

                OSPF    OVERFLOW
    
```

```

OSPF                NULL
                   OVERFLOW
    
```

```

clear ip ospf process          OSPF
OSPF OVERFLOW
no          OSPF          OVERFLOW
                                OSPF
    
```

OSPF OVERFLOW

```

Ruijie# config terminal
Ruijie(config)# router ospf 10
Ruijie(config-router)# no overflow memory-lack
    
```

| clear ip ospf process  | OSPF |
|------------------------|------|
| show ip protocols ospf | OSPF |

### 34.1.39 passive-interface

no

```

passive-interface [default | type number]
no passive-interface [default | type number]
    
```

| <i>type number</i> |  |
|--------------------|--|
| default            |  |

, OSPF

serial 1/0



```
Ruijie(config-router)# redistribute isis isis-001
level-1
```

Show run

```
router ospf 1
redistribute ospf 2 match external 1 internal subnets
redistribute isis isis-001 level-1-2
```

### 34.1.41 router ospf

```

          OSPF
no          OSPF
          router ospf
router ospf process-id [vrf vrf-name]
no router ospf process-id

```

|                   |                                                                          |
|-------------------|--------------------------------------------------------------------------|
|                   |                                                                          |
| <i>process-id</i> | ospf                                                                     |
| <i>vrf-name</i>   | <div style="text-align: center;">VRF</div> OSPF                      VRF |



|                          |  |
|--------------------------|--|
|                          |  |
| <b>show ip protocols</b> |  |

### 34.1.43 summary-address

OSPF

**summary-address**                    **no**

**summary-address** *ip-address net-mask* [**not-advertise** | **tag**  
 <0-4294967295> | ]

|                      |    |
|----------------------|----|
|                      |    |
| <i>ip-address</i>    | IP |
| <i>net-mask</i>      |    |
| <b>not-advertise</b> |    |

OSPF  
 OSPF

**area rang**                    area range                    OSPF  
 summary-address                    OSPF  
                   **NSSA**    **summary-address**                    **NSSA**    **ABR**

100.100.0.0/16

redRuijie(config)# **router ospf 20**

```
Ruijie(config-router)# summary-address 100.100.0.0
255.255.0.0
Ruijie(config-router)# redistribute static subnets
Ruijie(config-router)# network 200.2.2.0 0.0.0.255
area 1
Ruijie(config-router)# network 172.16.24.0 0.0.0.255
area 0
Ruijie(config-router)# area 1 nssa
```

|                   |      |
|-------------------|------|
|                   |      |
| <b>area range</b> | OSPF |

### 34.1.44 timers lsa-group-pacing

LSA

**no**

**timers lsa-group-pacing** *seconds*

**no timers lsa-group-pacing**

|                |                  |
|----------------|------------------|
|                |                  |
| <i>seconds</i> | LSA<br>: 10-1800 |

: 240

LSA

120

```
Ruijie(config)#router ospf 20
```

```
Ruijie(config-router)#timers lsa-group-pacing 120
```



*spf-delay*   *spf-holdtime*

OSPF

|                         |                                                    |
|-------------------------|----------------------------------------------------|
| <i>spf-delay</i>        | SPF<br>1-600000<br>OSPF<br>SPF<br><i>spf-delay</i> |
| <i>spf-holdtime</i>     | SPF<br>1-600000                                    |
| <i>spf-max-waittime</i> | SPF<br>1-600000                                    |

*spf-delay* 1000

*spf-holdtime* 5000

*spf-max-waittime* 10000

```

spf-delay          SPF
          SPF          SPF
spf-holdtime      SPF
          spf-max-waittime
          SPF          SPF
          spf-holdtime
spf-delay  spf-holdtime
spf-max-waittime          SPF

timers spf          SPF

          timers throttle spf
    
```

---

```

:
1  spf-holdtime          spf-delay          spf-holdtime
   spf-delay
2  spf-max-waittime          spf-holdtime          spf-max-waittime
   spf-holdtime
3  timers throttle spf          timers spf
4  timers spf  timers throttle spf          timers
   throttle spf
    
```

```

                    OSPF   SPF
                    5     1000   90000
                    5ms  1s    3s    7s    15s   31s   63s   89s   179s  179+90 .....
Ruijie(config)# router ospf 20
Ruijie(config-router)# timers spf 5 1000 90000
    
```

|                     |                                                           |
|---------------------|-----------------------------------------------------------|
|                     |                                                           |
| <b>show ip ospf</b> | ospf                                                      |
| <b>timers spf</b>   | SPF 10.4<br>RGOS SPF<br>timers<br>throttle spf timers spf |

## 34.2

### 34.2.1 show ip ospf

```

                    OSPF
                    show ip ospf
                    show ip ospf [process-id]
    
```

|                   |      |
|-------------------|------|
|                   |      |
| <i>process-id</i> | ospf |

## OSPF

**show ip ospf**

```
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
isenabled
Supports only single TOS(TOS0) routes
Supports opaque LSA
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
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 isselected

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
isenabled
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

|                                         |                            |
|-----------------------------------------|----------------------------|
|                                         |                            |
| Router ID                               |                            |
| Process uptime                          | OSPF router-id<br>0.0.0.0  |
| Bound to VRF                            | OSPF VRF                   |
| Conforms to RFC2328                     | RFC2328                    |
| RFC1583Compatibility flag               | RFC1583<br>RFC2328<br>ASBR |
| Support Tos                             | TOS0                       |
| Supports opaque LSA                     | opaque-LSA                 |
| Router Type                             | OSPF normal<br>ABR ASBR    |
| SPF Delay                               | SPF                        |
| SPF-holdtime                            | SPF                        |
| LsaGroupPacing                          | LSA                        |
| Incomming current DD exchange neighbors | incomming<br>exstart       |
| Outgoing current DD exchange neighbors  | outgoing<br>exstart        |
| Number of external LSA                  | LSA                        |
| External LSA Checksum Sum               | LSA                        |

|                                                              |                               |
|--------------------------------------------------------------|-------------------------------|
| Number of opaque LSA                                         | opaque-LSA                    |
| Opaque LSA Checksum Sum                                      | opaque-LSA                    |
| Number of non-default external LSA                           | external-LSA                  |
| External LSA database limit                                  | external-LSA                  |
| Exit database overflow state interval                        | overflow                      |
| Database overflow state                                      | OSPF overflow                 |
| Number of LSA originated                                     | LSA                           |
| Number of LSA received                                       | LSA                           |
| Log Neighbor Adjency Changes                                 |                               |
| Number of areas attached to this router                      |                               |
| Area type                                                    | , Default, Stub,NSSA          |
| Number of interfaces in this area                            |                               |
| Number of fully adjacent neighbors in this area              | Full                          |
| Number of fully adjacent virtual neighbors through this area | Full                          |
| Area authentication                                          |                               |
| SPF algorithm last executed                                  | SPF                           |
| SPF algorithm executed times                                 | SPF                           |
| Number of LSA                                                | LSA                           |
| Checksum Sum                                                 | LSA                           |
| NSSA Translator State                                        | LSA NSSA External ABR<br>OSPF |
| BFD is enabled                                               | OSPF BFD                      |

### 34.2.2 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 |

OSPF ABR ASBR OSPF  
**show ip route** 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
```

|  |  |
|--|--|
|  |  |
|--|--|

|                  |               |
|------------------|---------------|
| FastEthernet 0/1 |               |
| ABR, ASBR        | ASBR ABR ASBR |
| Area 0.0.0.1     |               |
| select           | ASBR select   |

### 34.2.3 show ip ospf database

OSPF  
ospf database

show ip

LSAs

**show ip ospf** [*process-id area-id*] **database**

**show ip ospf** [*process-id area-id*] **database** [*adv-router ip-address*]

**show ip ospf** [*process-id area-id*] **database** [*self-originate | max-age*]

**show ip ospf** [*process-id area-id*] **database** [*router*] [*link-state-id*]

**show ip ospf** [*process-id area-id*] **database** [*router*] [*adv-router ip-address*]

**show ip ospf** [*process-id area-id*] **database** [*router*] [*self-originate*]

**show ip ospf** [*process-id area-id*] **database** [*network*][*link-state-id*]

**show ip ospf** [*process-id area-id*] **database** [*network*] [*link-state-id*]  
[*adv-router ip-address*]

**show ip ospf** [*process-id area-id*] **database** [*network*] [*link-state-id*]  
[*self-originate*]

**show ip ospf** [*process-id area-id*] **database** [*summary*] [*link-state-id*]

**show ip ospf** [*process-id area-id*] **database** [*summary*] [*link-state-id*]  
[*adv-router ip-address*]

**show ip ospf** [*process-id area-id*] **database** [*summary*] [*link-state-id*]  
[*self-originate*]

**show ip ospf** [*process-id area-id*] **database** [*asbr-summary*]  
[*link-state-id*]

**show ip ospf** [*process-id area-id*] **database** [*asbr-summary*]

*[link-state-id]* **adv-router** *ip-address*

|                         |             |
|-------------------------|-------------|
| <b>opaque-area</b>      | LSA         |
| <b>opaque-as</b>        | LSA         |
| <b>opaque-link</b>      | LSA         |
| <b>database-summary</b> | OSPF<br>LSA |

OSPF

OSPF

**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**

|                           |              |
|---------------------------|--------------|
|                           |              |
| OSPF Router with ID       | OSPF<br>OSPF |
| Router Link States        |              |
| Net Link States           |              |
| Summary Net Link States   |              |
| NSSA-external Link States |              |
| AS External Link States   |              |
| Link ID                   |              |
| ADV Router                |              |

|            |     |
|------------|-----|
| Age        |     |
| Seq#       | LSA |
| Cksum      |     |
| Link-Count |     |
| Route      | LSA |
| Tag        |     |

**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
Options: 0x2 (*|-|-|-|-|E|-)
LS Type: ASBR-summary-LSA
Link State ID: 3.3.3.3 (AS Boundary Router address)
Advertising Router: 1.1.1.1
LS Seq Number: 80000001
Checksum: 0xbe8c
Length: 28
Network Mask: /0
TOS: 0 Metric: 1
```

**show ip ospf database asbr-summary**

|                        |      |
|------------------------|------|
|                        |      |
| OSPF Router with ID    | OSPF |
| AS Summary Link States | AS   |
| LS age                 |      |
| Options                |      |
| LS Type                |      |
| Link State ID          |      |
| Advertising Router     |      |
| LS Seq Number          |      |

|              |                  |
|--------------|------------------|
| Checksum     |                  |
| Length       |                  |
| Network Mask |                  |
| TOS          | TOS            0 |
| Metric       |                  |

**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: /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**



|               |  |
|---------------|--|
| LS Seq Number |  |
| Checksum      |  |
| Length        |  |
| Network Mask  |  |

|                    |  |
|--------------------|--|
| LS age             |  |
| Options            |  |
| LS Type            |  |
| Link State ID      |  |
| Advertising Router |  |
| LS Seq Number      |  |
| Checksum           |  |
| Length             |  |
| Network Mask       |  |
| Attached Router    |  |

**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 Router with ID | OSPF |
| Router Link States  |      |

|                    |        |
|--------------------|--------|
| LS age             |        |
| Options            |        |
| Flag               | router |
| LS Type            |        |
| Link State ID      |        |
| Advertising Router |        |
| LS Seq Number      |        |
| Checksum           |        |

Length

|                         |                  |
|-------------------------|------------------|
| OSPF Router with ID     | OSPF             |
| Summary Net Link States |                  |
| LS age                  |                  |
| Options                 |                  |
| LS Type                 |                  |
| Link State ID           |                  |
| Advertising Router      |                  |
| LS Seq Number           |                  |
| Checksum                |                  |
| Length                  |                  |
| Network Mask            |                  |
| TOS                     | TOS            0 |
| Metric                  |                  |

**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

4f292.74 7052a.44 674.660.001 Tc 0 -1. T\*<15th

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**

**show ip ospf database database-summary**

```
Ruijie# show ip ospf database database-summary
OSPF process 1:
Router Link States      : 4
Network Link States    : 2
Summary Link States    : 4
ASBR-Summary Link States : 0
AS External Link States : 4
NSSA-external Link States: 2
```

**show ip ospf database database-summary**

| OSPF Process       |                |
|--------------------|----------------|
| Router Link        | OSPF LSA       |
| Network Link       | OSPF LSA       |
| Summary Link       | OSPF LSA       |
| ASBR-Summary Link  | OSPFASBR LSA   |
| AS External Link   | OSPF LSA       |
| NSSA-external Link | ,OSPF NSSA LSA |



```

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**

|                              |                               |
|------------------------------|-------------------------------|
|                              |                               |
| FastEthernet 0/0 State       | Down UP                       |
| 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<br>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     |
| BFD enabled             | OSPF BFD |

### 34.2.5 show ip ospf neighbor

OSPF **show ip ospf**  
**neighbor**

**show ip ospf** [*process-id*] **neighbor** [[**detail**] | [[*interface-type*  
*interface-number*] [*neighbor-id*]]]

|                                                  |  |
|--------------------------------------------------|--|
|                                                  |  |
| <b>detail</b>                                    |  |
| <i>interface-type</i><br><i>interface-number</i> |  |
| <i>neighbor-id</i>                               |  |

OSPF

**show ip ospf neighbor**

```
Ruijie# show ip ospf neighbor
OSPF process 1, 1 Neighbors, 1 is Full:
Neighbor ID      Pri   State           BFD State  Dead Time
Address          Interface
3.3.3.3          1     Full/BDR        Up         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
BFD session state up
```

**show ip ospf neighbor**

| Neighbor ID |      |
|-------------|------|
| Pri         | DR   |
| State       |      |
| Dead Time   | Dead |

|                                            |                                                       |
|--------------------------------------------|-------------------------------------------------------|
| Address                                    |                                                       |
| Interface                                  |                                                       |
| interface address                          |                                                       |
| In the area                                |                                                       |
| via interface                              |                                                       |
| Neighbor priority                          | OSPF                                                  |
| State                                      | OSPF FULL<br>DR<br>BDR<br>DROTHER<br>DR/BDR<br>DR BDR |
| State changes times                        |                                                       |
| Dead Time                                  |                                                       |
| DR                                         | ( Hello DR )                                          |
| BDR                                        | ( Hello BDR )                                         |
| Options                                    | Hello E 0<br>STUB<br>STUB                             |
| Dead timer due in                          |                                                       |
| Neighbor up time                           |                                                       |
| Database Summary List                      | DD                                                    |
| Link State Request List                    | LS                                                    |
| Link State Retransmission List             |                                                       |
| Crypt Sequence Number                      | MD5                                                   |
| Thread Inactivity Timer                    |                                                       |
| Thread Database Description Retransmission | DD                                                    |
| Thread Link State Request Retransmission   | LS                                                    |
| Thread Link State Update Retransmission    | LS                                                    |

|                   |            |
|-------------------|------------|
| Thread Poll Timer | Poll Timer |
|-------------------|------------|

### 34.2.6 show ip ospf route

```
ospf
```

```
show ip ospf [process-id] route[count]
```

|                   |      |      |
|-------------------|------|------|
|                   |      |      |
| <i>process-id</i> | ospf | ospf |
| <b>count</b>      | 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 |  |

|     |      |
|-----|------|
| [1] | cost |
| via |      |

### 34.2.7 show ip ospf summary-address

OSPF

**show ip ospf summary-address**

**show ip ospf summary-address**

NSSA ABR

#### **show ip ospf summary-address**

```
Ruijie# show ip ospf summary-address
Summary Address Summary Mask Advertise Status
Aggregated subnets
-----
202.101.0.0          255.255.0.0          advertise
Inactive 0
Ruijie#
```

|                 |  |
|-----------------|--|
|                 |  |
| Summary Address |  |
| Summary Mask    |  |

|                    |  |
|--------------------|--|
| Advertise          |  |
| Status             |  |
| Aggregated subnets |  |

### 34.2.8 show ip ospf virtual-link

```

OSPF                               show ip ospf
virtual-link
show ip ospf [process-id] virtual-link
    
```

|  |  |
|--|--|
|  |  |
|  |  |

**show ip ospf neighbor**

**show ip ospf virtual-links**

```

Ruijie# show ip ospf virtual-links
Virtual Link VLINK0 to router 1.1.1.1 is up
Transit area 0.0.0.1 via interface FastEthernet 0/1
Local address 10.0.0.37/32
Remote address 10.0.0.27/32
Transmit Delay is 1 sec, State Point-To-Point,
Timer intervals configured, Hello 10, Dead 40, Wait 40,
Retransmit 5
Hello due in 00:00:05
    
```

Adjacency state Full

| Virtual Link VLINK0 to router |   |
|-------------------------------|---|
| Virtual Link state            | . |
| Transit area                  |   |
| via interface                 |   |
| Local address                 |   |
| Remote Address                |   |
| Transmit Delay                |   |

# 35 BGP

## 35.1

### 35.1.1 address-family ipv4

```

          address-family IPv4      BGP
exit-address-family      BGP
address-family ipv4 [unicast]
no address-family ipv4 [unicast]

```

|         |      |
|---------|------|
|         |      |
| unicast | IPv4 |

BGP

BGP

BGP

IPv4

exit-address-family

```

Ruijie(config)# router bgp 65000
Ruijie(config-router)# address-family ipv4

```

|                     |  |
|---------------------|--|
|                     |  |
| exit-address-family |  |

### 35.1.2 address-family ipv4 vrf

```

          address-family IPv4 VRF      BGP
vrf                no                vrf
          exit-address-family      BGP

```

**address-family ipv4 vrf** *vrf-name*

**no address-family ipv4 vrf** *vrf-name*

|                 |     |
|-----------------|-----|
|                 |     |
| <i>vrf-name</i> | vrf |

vrf

BGP

```

          PE  CE
          BGP                exit-address-family

```

```

Ruijie(config)# router bgp 65000
Ruijie(config-router)# address-family ipv4 vrf vpn1

```

|                            |  |
|----------------------------|--|
|                            |  |
| <b>exit-address-family</b> |  |

### 35.1.3 address-family vpnv4

```

          PE          VPN
address-family VPN          exit-address-family
address-family VPN
address-family vpnv4 [unicast]
no address-family vpnv4 [unicast]

```

|  |  |
|--|--|
|  |  |
|--|--|

|                |      |
|----------------|------|
| <b>unicast</b> | IPv4 |
|----------------|------|

vpn

BGP

vpn

PE

vpn

BGP

**exit-address-family**

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# address-family vpnv4
```

|                            |  |
|----------------------------|--|
|                            |  |
| <b>exit-address-family</b> |  |

### 35.1.4 aggregate-address IPv4

BGP IPv4

no

**aggregate-address** *ip-address mask* [**as-set**][**ummary-only**]

**no aggregate-address** *ip-addres mask* [**as-set**][**summary-only**]

|                     |    |
|---------------------|----|
|                     |    |
| <i>ip-address</i>   |    |
| <i>mask</i>         |    |
| <b>as-set</b>       | AS |
| <b>summary-only</b> |    |

BGP                      BGP IPv4                      BGP IPv4 VRF

BGP

**aggregate-address summary-only**

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# aggregate-address 10.0.0.0
255.0.0.0 as-set
```

|            |     |
|------------|-----|
|            |     |
| router bgp | BGP |

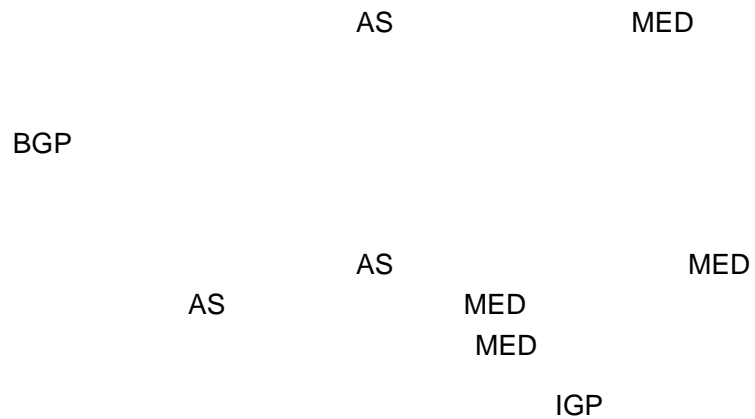
### 35.1.5 bgp always-compare-med

BGP                      Multi Exit Discriminator    MED

**no**

**bgp always-compare-med**

**no bgp always-compare-med**



```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# bgp always-compare-med
```

| <b>show ip bgp</b>                       | BGP       |
|------------------------------------------|-----------|
| <b>bgp bestpath med confed</b>           | AS<br>MED |
| <b>bgp bestpath med missing-as-worst</b> | MED       |
| <b>bgp deterministic-med</b>             | AS        |

### 35.1.6 bgp bestpath as-path ignore

```
no
bgp bestpath as-path ignore
no bgp bestpath as-path ignore
```

AS

BGP

BGP(1771)

|                    |     |
|--------------------|-----|
|                    |     |
| <b>show ip bgp</b> | BGP |

### 35.1.7 bgp bestpath compare-confed-aspash

ASPATH

ASPATH

**no**

```

router ID                                     router ID
no
bgp bestpath compare-routerid
no bgp bestpath compare-routerid
    
```

EBGP peers

BGP

EBGP

```

peers
router ID
    
```

```

Ruijie(config)# router bgp 65000
Ruijie(config-router)# bgp bestpath compare-routerid
    
```

|                      |               |
|----------------------|---------------|
|                      |               |
| <b>show ip bgp</b>   | BGP           |
| <b>bgp router-id</b> | BGP Router ID |

### 35.1.9 bgp bestpath med confed

```

AS
MED no
bgp bestpath med confed [missing-as-worst]
no bgp bestpath med confed [missing-as-worst]
    
```

|  |  |
|--|--|
|  |  |
|--|--|

|                         |     |
|-------------------------|-----|
| <b>missing-as-worst</b> | MED |
|-------------------------|-----|

AS

MED

BGP

AS

MED

```
Ruijie(config)# router bgp 65000
```

```
Ruijie(config-router)# bgp bestpath med confed
```

```
[REDACTED] 02 16 Tf0Td( )TjET174.7gAg1C163q29
```

```

0          MED          MED          MED

```

BGP

```

0          MED          MED          MED
          MED          MED

```

```

Ruijie(config)# router bgp 65000
Ruijie(config-router)# bgp bestpath med
missing-as-worst

```

|                     |     |
|---------------------|-----|
|                     |     |
| <b>show ip bgp</b>  | BGP |
| <b>bgp bestpath</b> |     |

BGP

**reflection**

**no bgp client-to-client**

Ruijie(config)#

router ID

ID

BGP speakers  
BGP speaker EBGP IBGP  
BGP speakers EBGP  
MED

BGP speakers  
MED

EBGP

AS

---

15

15

---

```
Ruijie(config-router)# bgp confederation peers 65000  
65100
```

|                                     |  |
|-------------------------------------|--|
|                                     |  |
| <b>bgp confederation identifier</b> |  |

### 35.1.15 bgp default ipv4-unicast

```

                                address family    IPv4
no
bgp default ipv4-unicast
no bgp default ipv4-unicast

```

ipv4-unicast

BGP

```

                                BGP            address family    ipv4

```

```
Ruijie(config-router)# bgp default ipv4-unicast
```





### 35.1.18 bgp enforce-first-as

```

                                AS_PATH                AS
UPDATE                          no
bgp enforce-first-as
no bgp enforce-first-as

```

BGP

```

                                UPDATE                AS

```

```
Ruijie(config-router)# bgp enforce-first-as
```

|                    |     |
|--------------------|-----|
|                    |     |
| <b>show ip bgp</b> | BGP |

### 35.1.19 bgp fast-external-fallover

```
#Qd1Rp 063'Sh,w, Uó , 9 } / BGPnoCÀK•Ó'—r CÃ X!%o Äfast-ext527
```

BGP

EBGP

```
Ruijie(config-router)# bgp faster-external-fallover
```

|            |     |
|------------|-----|
|            |     |
| router bgp | BGP |

### 35.1.20 bgp log-neighbor-changes

no debug BGP

---

```
bgp log-neighbor-changes  
no bgp log-neighbor-changes
```

```
BGP bg4BC82-G7Tc 0.002Tj/C2_0 1 41-2.520 1 <01_0 1 T43309C31 T9Tf0 Tc 2
```

```
bgp faster-external-fallover
```

```
acBGPW) BabB9AR7Sawv1A#2xyFvoajA#Nxy(2)waw c NWvcBNpK@K@bNcaN54M@
```



BGP

---

ipv4

peer ipv4

| <b>neighbor soft-reconfiguration inbound</b> | BGP session ( ) BGP |
|----------------------------------------------|---------------------|
| <b>show ip bgp</b>                           | BGP                 |

### 35.1.23 clear ip bgp dampening

**clear ip bgp [ipv4 unicast] dampening [address mask]**

| <b>ipv4 unicast</b> | IPv4 |
|---------------------|------|
| <i>address</i>      | IP   |
| <i>mask</i>         |      |

BGP  
BGP

Ruijie# **clear ip bgp dampening 192.168.0.0 255.255.0.0**

| <b>show ip bgp dampening dampened-paths</b> |  |
|---------------------------------------------|--|
| <b>bgp dampening</b>                        |  |

### 35.1.24 clear ip bgp external

## EBGP

**clear ip bgp external [ipv4 unicast] [[soft] [in | out]]**

| <b>ipv4 unicast</b> | ipv4             |
|---------------------|------------------|
| <b>in</b>           | soft             |
| <b>out</b>          | soft BGP speaker |
| <b>soft in</b>      |                  |
| <b>soft out</b>     |                  |

## BGP

Ruijie# **clear ip bgp external in**

| <b>clear ip bgp</b>          | BGP |
|------------------------------|-----|
| <b>show ip bgp neighbors</b> | BGP |

### 35.1.25 clear ip bgp flap-statistics

**clear ip bgp flap-statistics [address[ mask]]**

| <i>address</i> | IP |
|----------------|----|

|             |  |
|-------------|--|
| <i>mask</i> |  |
|-------------|--|



|                 |  |
|-----------------|--|
| <b>soft out</b> |  |
|-----------------|--|

vrf

BGP

```
Ruijie# clear ip bgp vrf my-vrf in
```

|                     |     |
|---------------------|-----|
|                     |     |
| <b>clear ip bgp</b> | BGP |
| <b>show ip bgp</b>  | BGP |

### 35.1.28 default-informnation originate

no

```
[no] default-informnation originate
```

no

BGP

```
network
originate
IGP
```

```
default-informnation
network
```

Ruijie(config-router)# **default-information originate**

|                     |  |
|---------------------|--|
|                     |  |
| <b>network</b>      |  |
| <b>redistribute</b> |  |

### 35.1.29 default-metric

BGP metric  
**no**  
**default-metric** *number*  
**no default-metric**

|               |                       |
|---------------|-----------------------|
|               |                       |
| <i>number</i> | metric 1.. 4294967295 |

**no** default-metric

BGP

BGP metric  
 metric

---

metric **redistribute metric**  
 metric  
**default-metric** connected metric  
 0

---

```
Ruijie(config-router)# default-metric 45
```

|                     |  |
|---------------------|--|
|                     |  |
| <b>redistribute</b> |  |

### 35.1.30 distance bgp

BGP

no

**distance bgp** *external-distance internal-distance local-distance*

**no distance bgp** [*external-distance internal-distance local-distance*]

|                          |                                  |               |
|--------------------------|----------------------------------|---------------|
|                          |                                  |               |
| <i>external-distance</i> | EBGP peers<br>1..255             |               |
| <i>internal-distance</i> | IBGP peers<br>1..255             |               |
| <i>local-distance</i>    | peers<br><b>network backdoor</b> | IGP<br>1..255 |

```
external-distance 20
```

```
internal-distance 200
```

```
local-distance 200
```

BGP

BGP

1. external-distance IGP (OSPF RIP )

2. internal-distance local-distance IGP

```
Ruijie(config-router)# distance bgp 20 20 200
```

|                                              |                     |
|----------------------------------------------|---------------------|
|                                              |                     |
| <b>neighbor soft-reconfiguration inbound</b> | BGP session ( ) BGP |
| <b>show ip bgp</b>                           | BGP                 |

### 35.1.31 exit-address-family

```

BGP address-family
exit-address-family

```

```
BGP address-family
```

```

bgp address-family
bgp

```

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

|                            |                            |
|----------------------------|----------------------------|
|                            |                            |
| <b>address-family ipv4</b> | <b>address-family ipv4</b> |

### 35.1.32 ip as-path access-list

```

AS no

```

**ip as-path access-list** *path-list-num* {**permit** | **deny**}

*regular-expression*

**no ip as-path access-list** *path-list-num*

| <i>path-list-num</i>      | AS<br>AS 1---500 |
|---------------------------|------------------|
| <b>permit</b>             |                  |
| <b>deny</b>               |                  |
| <i>regular-expression</i> | 1..255           |

## BGP

```
Ruijie(config-router)# ip as-path access-list 1 deny
^123$
```

| <b>neighbor filter-list</b>     | as-path |
|---------------------------------|---------|
| <b>neighbor distribute-list</b> |         |

### 35.1.33 neighbor activate

no

**neighbor** {*peer-address* | *peer-group-name*} **activate**

**no neighbor** {*peer-address* | *peer-group-name*} **activate**



*peer-address*

|                        |          |
|------------------------|----------|
| <i>peer-group-name</i> | 32       |
| <i>seconds</i>         | : 1..600 |

IBGP : 15seconds

EBGP : 30seconds

BGP

BGP

|               |              |   |
|---------------|--------------|---|
| <i>number</i> | AS<br>[1,10] | 3 |
|---------------|--------------|---|

allowas-in

BGP

BGP IPv4

BGP

IPv4VRF

spoke\_hub

PE

PE

vrf

PE

PE

vrf

CE

vrf

CE

PE

IBGP

EBGP

Ruijie(config)# CECE

|                        |    |
|------------------------|----|
| <i>peer-group-name</i> | 32 |
|------------------------|----|

as-override

BGP            BGP IPv4                    BGP    IPv4VRF

```

      BGP
      AS
      BGP
      AS
      vpn
      CE
      PE
      CE
      AS
      EBGP
      CE
      PE
      CE
      AS

```

```

Ruijie(config)# router bgp 60
Ruijie(config-router)# neighbor 10.0.0.1 remote-as 100
Ruijie(config-router)# address-family ipv4 vrf vpn1
Ruijie(config-router-af)# neighbor 10.0.0.1
as-override

```

|  |  |      |
|--|--|------|
|  |  | .500 |
|--|--|------|

| <i>peer-address</i>    |                           |
|------------------------|---------------------------|
| <i>peer-group-name</i> | 32                        |
| <i>map-tag</i>         | route map<br>route map 32 |

BGP

|                        |           |
|------------------------|-----------|
| <i>peer-address</i>    |           |
| <i>peer-group-name</i> | 32        |
| <i>text</i>            | ( )<br>80 |

### BGP

```
Ruijie(config)# router bgp 60
Ruijie(config-router)# neighbor 10.1.1.1 remote-as 80
Ruijie(config-router)# neighbor 10.1.1.1 description
xyz.com
```

| <b>router bgp</b>         | BGP     |
|---------------------------|---------|
| <b>neighbor remote-as</b> | BGP ( ) |

### 35.1.39 neighbor distribute-list

```
BGP                                ACL
no                                ACL
neighbor {peer-address | peer-group-name} distribute-list
access-list-number {in | out}
no neighbor {peer-address | peer-group-name} distribute-list
access-list-number {in | out}
```

| <i>peer-address</i> | IPv4<br>IPv6 |
|---------------------|--------------|

|                           |     |
|---------------------------|-----|
| <i>peer-group-name</i>    | 32  |
| <i>access-list-number</i> | ACL |
| <b>in</b>                 | ACL |
| <b>out</b>                | ACL |

BGP                    BGP IPv4                    BGP IPv6  
                           BGP IPv4 VRF                    BGP VPNv4  
  
                                           (in)                    (out)                    neighbor  
 prefix-list  
                                           BGP  
                                                                                           **neighbor distribute-list**

```
Ruijie(config)# router bgp 60
```

```
Ruijie(config-router)# neighbor 10.1.1.1 remote-as B&ç&q ÓiFp p Â ð WÍ
```



## BGP

no

**neighbor** {*peer-address* | *peer-group-name*} **filter-list** *access-list-number* {**in** | **out**}

**no neighbor** {*peer-address* | *peer-group-name*} **filter-list** *access-list-number* {**in** | **out**}

| <i>peer-address</i>       | IPv6<br>IPv4 |
|---------------------------|--------------|
| <i>peer-group-name</i>    | 32           |
| <i>access-list-number</i> | as-path list |
| <b>in</b>                 | as-path list |
| <b>out</b>                | as-path list |

BGP            BGP IPv4            BGP IPv6  
BGP IPv4 VRF            BGP VPNv4

## BGP

## neighbor filter-list

```
Ruijie(config)# ip as-path access-list 1 deny _123_
Ruijie(config)# router bgp 65000
Ruijie(config-router)# neighbor 10.0.0.1 remote-as 65100
Ruijie(config-router)# neighbor 10.0.0.1 filter-list 1 out
```

|  |  |
|--|--|
|  |  |
|--|--|

|                               |              |
|-------------------------------|--------------|
| <b>router bgp</b>             | BGP          |
| <b>neighbor remote-as</b>     | BGP          |
| <b>ip as-path access-list</b> | AS_PATH list |
| <b>match as-path</b>          | AS_PATH list |

### 35.1.42 neighbor maximum-prefix

BGP

no

**neighbor** {*peer-address* | *peer-group-name*} **maximum-prefix**  
*maximum* [*threshold*] [**warning-only**]

**no neighbor** {*peer-address* | *peer-group-name*} **maximum-prefix**

|                        |              |
|------------------------|--------------|
|                        |              |
| <i>peer-address</i>    | IPv4<br>IPv6 |
| <i>peer-group-name</i> | 32           |
| <i>maximum</i>         |              |
| <i>threshold</i>       |              |
| <b>warning-only</b>    | BGP          |

BGP

BGP IPv4

BGP IPv6

BGP IPv4 VRF

BGP

warning-only

BGP

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# neighbor 10.0.0.1
maximum-prefix 1000
```

| <b>router bgp</b>         | BGP |
|---------------------------|-----|
| <b>neighbor remote-as</b> | BGP |

### 35.1.43 neighbor next-hop-self

```
BGP
BGP speaker no
neighbor {peer-address | peer-group-name} next-hop-self
no neighbor {peer-address | peer-group-name} next-hop-self
```

| <i>peer-address</i>    | IPv6 IPv4 |
|------------------------|-----------|
| <i>peer-group-name</i> | 32        |

```
BGP BGP IPv4 BGP IPv6
BGP IPv4 VRF
```

( Frame Relay X.25)

BGP speakers

BGP

```
Ruijie(config)# router bgp 65000  
Ruijie(config-router)# neighbor 10.0.0.1 next-hop-self
```

## BGP

password

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# neighbor 10.0.0.1 password
Red-Giant
```

| <b>router bgp</b>         | BGP |
|---------------------------|-----|
| <b>neighbor remote-as</b> | BGP |

### 35.1.45 neighbor peer-group (assigning members)

```
no          BGP          BGP
           BGP
neighbor peer-address peer-group peer-group-name
no neighbor peer-address peer-group peer-group-name
```

| <i>peer-address</i>    | IPv6 IPv4 |
|------------------------|-----------|
| <i>peer-group-name</i> | 32        |

BGP

**remote-as update-source local-as reconnect-interval times  
advertisemet-interval default-originate next-hop-self remove-p  
rivate-as send-community distribute-list out filter-list out p  
refix-list out route-map out unsuppress-map route-reflector-c  
lient**

EBGP peer-group IBGP  
peer-group

Ruijie(config)# **router bgp 65000**



|                         |                   |
|-------------------------|-------------------|
| <i>prefix-list-name</i> | prefix-list<br>32 |
| <b>in</b>               | prefix list       |
| <b>out</b>              | prefix list       |

BGP BGP IPv4 BGP IPv6  
 BGP IPv4 VRF BGP VPNv4

(in) (out) neighbor

**distribute-list**

BGP

neighbor prefix-list in

```
Ruijie(config)# ip prefix-list bgp-filter deny
10.0.0.1/16
Ruijie(config)# router bgp 65000
Ruijie(config-router)# neighbor 10.0.0.1 prefix-list
bgp-filter in
```

|                           |     |
|---------------------------|-----|
|                           |     |
| <b>router bgp</b>         | BGP |
| <b>neighbor remote-as</b> | BGP |
| <b>ip prefix-list</b>     | ip  |

### 35.1.48 neighbor remote-as

BGP ( ) no  
 ( )

**neighbor** {*peer-address* | *peer-group-name*} **remote-as** *as-number*

**no neighbor** {*peer-address* | *peer-group-name*} **remote-as** *as-number*

|                        |              |
|------------------------|--------------|
| <i>peer-address</i>    | IPv6<br>IPv4 |
| <i>peer-group-name</i> | 32           |

```

BGP          BGP IPv4          BGP IPv6
      BGP IPv4 VRF

      EBGP
AS          AS          EBGP AS
      AS
AS          64512 65535
    
```

```

Ruijie(config)# router bgp 65000
Ruijie(config-router)# neighbor 10.0.0.1
remove-private-as
    
```

|                           |     |
|---------------------------|-----|
|                           |     |
| <b>router bgp</b>         | BGP |
| <b>neighbor remote-as</b> | BGP |

### 35.1.50 neighbor route-map

**no**

```

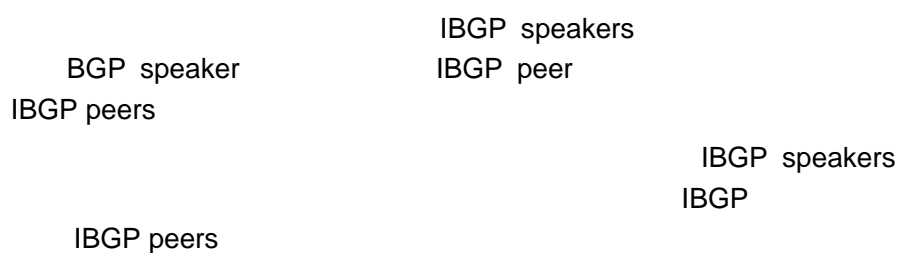
neighbor {peer-address | peer-group-name} route-map map-tag {in | out}
no neighbor {peer-address | peer-group-name} route-map map-tag {in | out}
    
```

|  |  |
|--|--|
|  |  |
|--|--|

hÚA Ÿ `# @ SÁ S"u Ö'pĭ TÂ #lë-Þ ÆðÔsm1 / ðÁ t !fØu ZŪÛ #r?#ÆP vQ ñ ÐU # || X~† P <30€ ,ÖÃ6Ñ Ö 0ÑÍÓP `4

| <i>ip-address</i>      |    |
|------------------------|----|
| <i>peer-group-name</i> | 32 |

BGP



```

Ruijie(config)# router bgp 65000
Ruijie(config-router)# neighbor 10.0.0.1
route-reflector-client

```

| <b>router bgp</b>                      | BGP |
|----------------------------------------|-----|
| <b>neighbor remote-as</b>              | BGP |
| <b>bgp cluster-id</b>                  | ID  |
| <b>bgp client-to-client reflection</b> |     |

### 35.1.52 neighbor send-community

BGP **no**

```

neighbor {peer-address | peer-group-name} send-community
[both|standard|extended]
no neighbor {peer-address | peer-group-name} send-community

```

**[both|standard|extended]**



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| <i>peer-address</i>    | IPv6<br>IPv4 |
|------------------------|--------------|
| <i>peer-group-name</i> | 32           |

| <i>peer-address</i>    | IPv6<br>IPv4 |
|------------------------|--------------|
| <i>peer-group-name</i> | 32           |

BGP

BGP                      BGP        ( )

**show ip bgp neighbors**

BGP

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# neighbor 10.0.0.1
soft-reconfiguration inbound
```

| <b>router bgp</b>            | BGP |
|------------------------------|-----|
| <b>neighbor remote-as</b>    | BGP |
| <b>show ip bgp neighbors</b> | BGP |
| <b>clear ip bgp</b>          | BGP |

**35.1.55 neighbor soo**,    **no**

**neighbor** [*peer-address* | *peer-group-name*] **soo** **soo-value**

**no neighbor** [*peer-address* | *peer-group-name*] **soo**

|                        |                                         |
|------------------------|-----------------------------------------|
|                        |                                         |
| <i>peer-address</i>    |                                         |
| <i>peer-group-name</i> | 32                                      |
|                        | soo      soo_value                      |
| <i>soo-value</i>       | 1   soo_value   as_num   nn      an_num |
|                        | *                                       |

**neighbor** [*peer-address* | *peer-group-name*] **timers** *keepalive* *holdtime*  
**no neighbor** [*peer-address* | *peer-group-name*] **timers** *keepalive*  
*holdtime*

|                        |                                           |
|------------------------|-------------------------------------------|
|                        |                                           |
| <i>peer-address</i>    | IPv4<br>IPv6                              |
| <i>peer-group-name</i> | 32                                        |
| <i>keepalive</i>       | BGP<br>message      KEEPALIVE<br>0..65535 |
| <i>holdtime</i>        | BGP<br>0..65535                           |

*keepalive*: 60

*holdtime*: 180

BGP

```

      keepalive      holdtime
      peer  peer-group      peer  peer
group
      BGP

```

Ruijie(config)# **router bgp** 65000

Ruijie(config-router)# **neighbor** 10.0.0.1 80 240

|                   |                                  |
|-------------------|----------------------------------|
|                   |                                  |
| <b>router bgp</b> | BGP                              |
| <b>timers bgp</b> | <i>keepalive</i> <i>holdtime</i> |

### 35.1.57 neighbor unsuppress-map

**aggregate-address****no**

**neighbor** {*peer-address* | *peer-group-name*} **unsuppress-map**  
*map-tag*

**no neighbor** {*peer-address* | *peer-group-name*} **unsuppress-map**

| <i>peer-address</i>    |                           |
|------------------------|---------------------------|
| <i>peer-group-name</i> | 32                        |
| <i>map-tag</i>         | route-map<br>route map 32 |

BGP

BGP

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# neighbor 10.0.0.1
unsuppress-map unspress-route
```

| <b>router bgp</b>         | BGP       |
|---------------------------|-----------|
| <b>neighbor remote-as</b> | BGP       |
| <b>aggregate-address</b>  |           |
| <b>route-map</b>          | route-map |

### 35.1.58 neighbor update-source

IBGP

BGP

BGP

**no**

**neighbor** {*peer-address* | *peer-group-name*} **update-source**  
*interface-type interface-index*

**no neighbor** {*peer-address* | *peer-group-name*} **update-source**  
*interface-type interface-index*

| <i>peer-address</i>    | IPv6 | IPv4 |
|------------------------|------|------|
| <i>peer-group-name</i> | 32   |      |
| <i>interface-type</i>  |      | '    |

A

|                    |     |
|--------------------|-----|
| neighbor remote-as | BGP |
|--------------------|-----|

### 35.1.59 neighbor version

no                    BGP                    BGP

**neighbor** {*ip-address*|*peer-group-name*} **weight** *number*  
**no neighbor** {*ip-address*|*peer-group-name*} **weight**

| <i>ip-address</i>      |           |
|------------------------|-----------|
| <i>peer-group-name</i> | 32        |
| <i>number</i>          | 0...65535 |

32768 0

BGP

route-map set weight

Ruijie(config-router)# **neighbor 10.1.1.1 weight 73**

| <b>router bgp</b>         | BGP |
|---------------------------|-----|
| <b>neighbor remote-as</b> | BGP |

### 35.1.61 network(BGP)

BGP speaker no

**network** *network-number* **mask** *mask* [**route-map** *map-tag*]  
**[backdoor]**  
**no network** *network-number* **mask** *mask* [**route-map**] [**backdoor**]

|                       |                                      |
|-----------------------|--------------------------------------|
|                       |                                      |
| <i>network-number</i> |                                      |
| <i>mask</i>           |                                      |
| <i>map-tag</i>        | route-map<br>route map            32 |
| <b>backdoor</b>       |                                      |

BGP

IGP                      BGP

route-map

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# network 10.0.0.1 mask
255.255.0.0
```

|                                |         |
|--------------------------------|---------|
|                                |         |
| <b>router bgp</b>              | BGP     |
| <b>redistribute</b>            |         |
| <b>Network synchronization</b> | Network |

### 35.1.62 network synchronization

BGP speaker                      network  
**no**                                      network

**network synchronization**  
**no network synchronization**

BGP

network

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# network synchronization
```

|                     |     |
|---------------------|-----|
|                     |     |
| <b>router bgp</b>   | BGP |
| <b>redistribute</b> |     |
| <b>network(BGP)</b> |     |

### 35.1.63 redistribute

BGP

no

```
redistribute protocol-type [route-map map-tag] [metric metric-value]
no redistribute protocol-type [route-map map-tag] [metric
metric-value]
```



BGP

BGP

BGP

IPv4

BGP

IPv6

**redistribute ospf** *process-id* [**route-map** *map-tag*] [**metric** *metric-value*]  
**[match** **internal** **external** [1|2] **nssa-external** [1|2]]

**no redistribute ospf** *process-id* [**route-map** *map-tag*] [**metric**  
*metric-value*] [**match** {**internal|external** [1|2]|**nssa-external** [1|2]}]

|                                   |                                      |
|-----------------------------------|--------------------------------------|
|                                   |                                      |
| <i>process-id</i>                 | OSPF                                 |
| <b>route-map</b> <i>map-tag</i>   | <b>route-map</b><br><b>route-map</b> |
| <b>metric</b> <i>metric-value</i> | metric                               |
| <b>match</b>                      | OSPF                                 |
| <b>internal</b>                   | OSPF internal<br>ospf match          |
| <b>external</b> [1 2]             | OSPF external<br>1 2<br>1 2          |
| <b>nssa-external</b> [1 2]        | OSPF nssa-external<br>1 2<br>1 2     |

OSPF

BGP

BGP IPv4

BGP IPv6

BGP IPv4 VRF

/

**no**

redistribute

no

no

```
OSPF                                match    OSPF
                                route-map metric
                                metric    route-map route-map
                                route-map route-map
metric                               metric
```

```
Ruijie(config-router)# redistribute ospf 2 route-map
static-rmap
```

```
Ruijie(config-router)# no redistribute ospf 4 match
external route-map ospf-rmap
```

```
Ruijie(config-router)# no redistribute ospf 78
```



**level-1-2**

isis level-1

|                          |  |
|--------------------------|--|
|                          |  |
| <b>show ip protocols</b> |  |

### 35.1.66 router bgp

BGP

BGP

**no**

BGP

**router bgp** *as-number*

**no router bgp** *as-number*

**no synchronization**

```

keepalive 60
holdtime 180
    
```

BGP

```

                keepalive          holdtime
                peer  peer-group          peer  peer
group
                BGP
    
```

```

Ruijie(config)# router bgp 65000
Ruijie(config-router)# timers bgp 80 240
    
```

|                        |                           |
|------------------------|---------------------------|
|                        |                           |
| <b>neighbor timers</b> | <i>keepalive holdtime</i> |

## 35.2

### 35.2.1 show ip bgp

BGP

```

show ip bgp [{network | network-mask}] [longer-prefixes]
    
```

|  |  |
|--|--|
|  |  |
|--|--|

## BGP

```
Ruijie# show ip bgp
Status codes: s suppressed, d damped, h history, * valid,
> b7.Ct 474- internal
```

|                               |  |
|-------------------------------|--|
| <b>bgp dampening</b>          |  |
| <b>clear ip bgp dampening</b> |  |

### 35.2.3 show ip bgp community

community BGP

**show ip bgp community** *community-number* [**exact -match**]

|                         |                                                          |
|-------------------------|----------------------------------------------------------|
|                         |                                                          |
| <i>community-number</i> | AA:NN( /2<br>internet<br>no-export local-as no-advertise |
| <b>exact -match</b>     |                                                          |

community

```
Ruijie# show ip bgp community local-as 111:12345
Status codes: s suppressed, d damped, h history, * valid,
> best, i - internal
Origin codes: i - IGP, e - EGP, ? - incomplete
Status Network      Next Hop      Metric  LocPrf  Path
-----
*> 211.21.21.0/24 110.110.110.10 0        1000    200
300
*> 211.21.23.0/24 110.110.110.10 0        1000    200
300
*> 211.21.25.0/24 110.110.110.10 0        1000    300
*> 211.21.26.0/24 110.110.110.10 0        1000    300
*> 211.21.27.0/24 110.110.110.10 0        1000    200
```

### 35.2.4 show ip bgp community-list

## BGP

**show ip bgp community-list *community-name* [exact-match]**

|                       |  |
|-----------------------|--|
|                       |  |
| <i>community-name</i> |  |
| <b>exact-match</b>    |  |

## BGP

```
Ruijie# show ip bgp community-list my_comm
Status codes: s suppressed, d damped, h history, * valid,
> best, i - internal
Origin codes: i - IGP, e - EGP, ? - incomplete
Status Network      Next Hop      Metric  LocPrf  Path
-----
*> 211.21.21.0/24    110.110.110.10  0        1000    200
300
*> 211.21.23.0/24    110.110.110.10  0        1000    200
300
*> 211.21.25.0/24    110.110.110.10  0        1000    300
*> 211.21.26.0/24    110.110.110.10  0        1000    300
*> 211.21.27.0/24    110.110.110.10  0        1000    200
```

|                          |  |
|--------------------------|--|
|                          |  |
| <b>ip community-list</b> |  |

### 35.2.5 show ip bgp dampening dampened-paths

**show ip bgp dampening dampened-paths**



## BGP

```
Ruijie# show ip bgp dampening flap-statistics
Status codes: s suppressed, d damped, h history, * valid,
> best, i - internal
Origin codes: i - IGP, e - EGP, ? - incomplete
Status Network          From          Flaps  Duration
Reuse  Path
-----
h      192.168.64.0/24    110.110.110.10    2
00:19:17      1000 i
h      201.234.1.0/24     110.110.110.10    2
00:19:17      1000 ?
h      201.234.2.0/23     110.110.110.10    2
00:19:17      1000 ?
h      201.234.2.0/23     110.110.110.10    2
00:19:17      1000 ?
h      201.234.2.0/23     110.110.110.10    2
00:19:17      1000 ?
h      201.234.2.0/23     110.110.110.10    2
00:19:17      1000 ?
```

**35.2.7 show ip bgp dampening parameters**

## BGP

```
show ip bgp dampening parameters
```

## BGP

```
Ruijie (config-router)# bgp dampening 25 10000 10000 200
Ruijie# show ip bgp dampening parameters
dampening 25 10000 10000 200
Dampening Control Block(s):
Reachability Half-Life time      : 25 min
Reuse penalty                    : 10000
Suppress penalty                 : 10000
Max suppress time                : 200 min
Max penalty (ceil)              : 29800000
Min penalty (floor)             : 5000
```

### 35.2.8 show ip bgp filter-list

**show ip bgp filter-list** *path-list-number*

| <i>path-list-number</i> |  |
|-------------------------|--|

```
Ruijie(config)# ip as-path access-list 5 permit .*
Ruijie# show ip bgp filter-list 5
BGP table version is 1, local router ID is 192.168.88.200
```

```

Status codes: s suppressed, d damped, h history, * valid,
> best, i - internal,
S Stale
Origin codes: i - IGP, e - EGP, ? - incomplete
Network      Next Hop      Metric LocPrf Weight Path
*> 192.168.88.0      0.0.0.0      32768 ?
Total number of prefixes 1

```

### 35.2.9 show ip bgp inconsistent-as

AS

**show ip bgp inconsistent-as**

AS

Ruijie# **show ip bgp inconsistent-as**

### 35.2.10 show ip bgp neighbors

BGP

**show ip bgp neighbors** [*neighbor-address*] [**received-routes** | **routes**  
| **advertised-routes**]

|                         |      |
|-------------------------|------|
|                         |      |
| <i>neighbor-address</i> |      |
| <b>received-routes</b>  | peer |
| <b>routes</b>           | peer |

|                   |  |
|-------------------|--|
| advertised-routes |  |
|-------------------|--|

## BGP

```
Ruijie# show ip bgp neighbors
BGP neighbor      : 12.12.12.2
Remote AS         : 100
Local AS          : 100
Neighbor type     : internal
BGP version       : 4
Remote ID         : 192.168.4.2
BGP state         : Established, up for 00:53:30
Min advertisement interval(secs): 15
Configured holdtime : 90
Configured keepalive : 30
Hold time         : 90
keepalive         : 30
Neighbor capabilities : ignore
Address family IPv4 Unicast: advertised , recieved
Route refresh     : advertised , recieved
Connections established : 1
Connections dropped : 0
Last reset       : never
Local host      : 12.12.12.1 Local port : 179
Remote host     : 12.12.12.2 Remote port : 1067
Maximum-Prefix limit : 4294967295
Threshold for warning : 0%
Accepted prefixes : 0
Prefix advertised : 6
Received messages : 110
Sent messages     : 116
Received notifications : 0
Sent notifications : 0
Route refresh received : 0
Route refresh sent : 0

Ruijie# show ip bgp neighbors 15.15.15.5 routes
Status codes: s suppressed, d damped, h history, * valid,
> best, i - internal
Origin codes: i - IGP, e - EGP, ? - incomplete
```

| Status | Network      | Next Hop   | Metric | LocPrf |
|--------|--------------|------------|--------|--------|
| *>i    | 58.1.1.0/24  | 58.58.58.8 |        | 58     |
| 100    | 800 ?        |            |        |        |
| *>i    | 58.1.2.0/24  | 58.58.58.8 |        | 58     |
| 100    | 800 ?        |            |        |        |
| *>i    | 58.1.3.0/24  | 58.58.58.8 |        | 58     |
| 100    | 800 ?        |            |        |        |
| *>i    | 58.1.4.0/24  | 58.58.58.8 |        | 58     |
| 100    | 800 ?        |            |        |        |
| *>i    | 58.1.5.0/24  | 58.58.58.8 |        | 58     |
| 100    | 800 ?        |            |        |        |
| *>i    | 58.1.6.0/24  | 58.58.58.8 |        | 58     |
| 100    | 800 ?        |            |        |        |
| *>i    | 58.1.7.0/24  | 58.58.58.8 |        | 58     |
| 100    | 800 ?        |            |        |        |
| *>i    | 58.1.8.0/24  | 58.58.58.8 |        | 58     |
| 100    | 800 ?        |            |        |        |
| *>i    | 58.1.9.0/24  | 58.58.58.8 |        | 58     |
| 100    | 800 ?        |            |        |        |
| *>i    | 58.1.10.0/24 | 58.58.58.8 |        | 58     |
| 100    | 800 ?        |            |        |        |
| *>i    | 67.1.1.0/24  | 67.67.67.7 |        | 67     |
| 100    | 700 ?        |            |        |        |
| *>i    | 67.1.2.0/24  | 67.67.67.7 |        | 67     |
| 100    | 700 ?        |            |        |        |
| *>i    | 67.1.3.0/24  | 67.67.67.7 |        | 67     |
| 100    | 700 ?        |            |        |        |
| *>i    | 67.1.4.0/24  | 67.67.67.7 |        | 67     |
| 100    | 700 ?        |            |        |        |
| *>i    | 67.1.5.0/24  | 67.67.67.7 |        | 67     |
| 100    | 700 ?        |            |        |        |
| *>i    | 67.1.6.0/24  | 67.67.67.7 |        | 67     |
| 100    | 700 ?        |            |        |        |

### 35.2.11 show ip bgp paths

```
show ip bgp paths
```

---

```
Ruijie# show ip bgp paths
```

### 35.2.12 show ip bgp quote-regexp

AS

BGP

```
show ip bgp quote-regexp regexp
```

| <i>regexp</i> | AS |
|---------------|----|

AS

BGP

```
Ruijie# show ip bgp quote-regexp "_300_"
Status codes: s suppressed, d damped, h history, * valid,
> best, i - internal
Origin codes: i - IGP, e - EGP, ? - incomplete
Network      Next Hop      Metric  LocPrf  Path
```

```

*> 211.21.21.0/24 110.110.110.10 0 1000 200
300
*> 211.21.23.0/24 110.110.110.10 0 1000 200
300
*> 211.21.25.0/24 110.110.110.10 0 1000 300
*> 211.21.26.0/24 110.110.110.10 0 1000 300

```

### 35.2.13 show ip bgp regexp

AS

BGP

```
show ip bgp regexp regexp
```

| <i>regexp</i> | AS |
|---------------|----|

AS

BGP

```

Ruijie# show ip bgp regexp _300_
Status codes: s suppressed, d damped, h history, * valid,
> best, i - internal valid, Network0.0003 l Hop0.0003 Tc 0.0 Mc 0.e

```

## BGP

**show ip bgp summary**

## BGP

```

Ruijie # show ip bgp summary
BGP router identifier 192.168.88.200, local AS number
500
BGP table version is 1
1 BGP AS-PATH entries
0 BGP community entries
Neighbor      V    AS MsgRcvd MsgSent  TblVer  InQ
OutQ Up/Down  State/PfxRcd
1.1.1.1      4    200     0      0      0     0   0
never Active
Total number of neighbors 1

```

|                   |         |
|-------------------|---------|
|                   |         |
| <b>router bgp</b> | BGP T J |

E

|                 |  |
|-----------------|--|
| <i>network</i>  |  |
| <b>neighbor</b> |  |
| <b>summary</b>  |  |
| <b>label</b>    |  |



|                              |  |
|------------------------------|--|
|                              |  |
| <i>community-list-number</i> |  |
| <i>community-list-name</i>   |  |

```
Ruijie# show ip community-list  
Community-list standard local  
permit local-AS  
Community-list standard Red-Giant  
permit 0:10  
deny 0:20
```

---

# 36

## 36.1

### 36.1.1 distribute-list in

**distribute-list in**                      **no**

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

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

| <i>access-list-number</i>                     |        |
|-----------------------------------------------|--------|
| <b>prefix</b> <i>prefix-list-name</i>         |        |
| <b>gateway</b> <i>prefix-list-name</i>        |        |
| <i>interface-type</i> <i>interface-number</i> | (    ) |

OSPF

OSPF

---

RIP Fastethernet 0/0  
172.16

```
router rip
network 200.168.23.0
distribute-list/T.Bh fastethernet 0/0
no auto-summary
!
access-list/T.permit/72.16.0.0 0.0.255.255
```

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

### 36.1.2 distribute-listout

**distribute-listout**                    **no**

**no distribute-list** {[*access-list-number* | *name*] | **prefix** *prefix-list-name*}  
**out** [*interface* | *protocol* | *process-id*]

| <i>access-list-number</i>             |        |
|---------------------------------------|--------|
| <b>prefix</b> <i>prefix-list-name</i> |        |
| <i>interface</i>                      | (    ) |
| <i>protocol</i>                       | (    ) |



---

AA:NN(

*community-number*

---

|                |  |
|----------------|--|
|                |  |
| <i>network</i> |  |

0.0.0.0/0

**default-network**

\*\*\*

connected

192.168.100.0

```
ip route 192.168.100.0 255.255.255.0 serial 0/1
ip default-network 192.168.100.0
```

200.200.200.0

200.200.200.0

```
ip default-network 200.200.200.0
```

|                      |    |
|----------------------|----|
|                      |    |
| <b>show ip route</b> | IP |

### 36.1.5 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-list-name</i>      |                        |
| <i>seq-number</i>            | 1 2147483647<br>5<br>5 |
| <b>deny</b>                  |                        |
| <b>permit</b>                |                        |
| <i>ip-prefix</i>             | IP 0 32                |
| <i>minimum-prefix-length</i> | )<br><b>ge</b>         |
| <i>maximum-prefix-length</i> | )<br><b>le</b>         |

```

ip prefix-list          IP          permit deny
                                ge     le
                                ip-prefix
                                ip-prefix
                                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

```

---

```

                                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

```

### 36.1.6 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> |  |

```

                                OSPF          RIP
                                IP            IP
                                IP  201.1.1.0/24
                                )

```

```

Ruijie# configure terminal
Ruijie(config)# ip prefix-list pre description Deny
routes from Net-A

```

---

**ip prefix-list description**

**no**

**ip prefix-list sequence-number**

( IP OSPF RIP  
IP ÉEliö !4Ôce-i•à ë>T0jT1,7Rat(02s0P@d<21A8,652x7Iro8

---

|                       |  |
|-----------------------|--|
| <b>permanent</b>      |  |
| <i>number</i>         |  |
| <b>disable/enable</b> |  |

1

OSPF 110  
125 OSPF

vrf vrf

1 **show ip route weight**  
weight WCMP

weight

WCMP 32  
WCMP

route 0.0.0.0 0.0.0.0 Fastethernet 0/0

ip

---

```
ip route 172.16.100.0 255.255.255.0 fastethernet 0/0
192.168.12.1
```

|                      |    |
|----------------------|----|
|                      |    |
| <b>show ip route</b> | IP |

### 36.1.9 ip routing

```
no ip routing
```

```
ip routing
```

```
no ip routing
```

```
IP
```

```
no ip routing
```

```
no ip routing
```

```
no ip routing
```

```
no ip routing
```

### 36.1.10 ip static route-limit

```
no ip static route-limit
```

```
ip static route-limit number
```

```
ip static route-limit number
```

|  |  |
|--|--|
|  |  |
|--|--|

|               |         |
|---------------|---------|
| <i>number</i> | 1-10000 |
|---------------|---------|

1000

**route-limit** **ip static**  
**show running config**

900

ip static route-limit 900

### 36.1.11 ipv6 prefix-list

IPv6 **ipv6**  
**prefix-list** **no**  
**ipv6 prefix-list** *prefix-lis-name* [ **seq** *seq-number* ] { **deny** | **permit** }  
*ipv6-prefix* [ **ge** *minimum-prefix-length* ] [ **le** *maximum-prefix-length* ]  
**no ipv6 prefix-list** *prefix-lis-name* [ **seq** *seq-number* ] { **deny** | **permit** }  
*ipv6-prefix* [ **ge** *minimum-prefix-length* ] [ **le** *maximum-prefix-length* ]

|                        |                                |
|------------------------|--------------------------------|
|                        |                                |
| <i>prefix-lis-name</i> |                                |
| <i>seq-number</i>      | 1 2147483647<br><br>5<br><br>5 |
| <b>deny</b>            |                                |



---

### 36.1.12 ipv6 prefix-list description

IPv6 **ipv6 prefix-list**  
**description** **no**  
**ipv6 prefix-list** *prefix-lis-name* **description** *descripton-text*

| <i>prefix-lis-name</i> | IPv6 |
|------------------------|------|
| <i>descripton-text</i> | IPv6 |

( IP 201.1.1.0/24 OSPF RIP IP

---

```
                OSPF                RIP
                IP                    IP
(                IP 201.1.1.0/24        )
```

```
Ruijie# configure terminal
Ruijie(config)# ipv6 prefix-list pre description Deny
routes from Net-A
```

### **36.1.14 match as-path**

---

|                            |         |
|----------------------------|---------|
| <b>match metric</b>        |         |
| <b>match origin</b>        |         |
| <b>set as-path prepend</b> | AS_PATH |
| <b>set metric</b>          |         |
| <b>set metric-type</b>     |         |

### **36.1.15 match community**

---

```

set match 1 match 1

```

```

ip community-list 1 permit 100:2 100:30
route-map set_lopref
match community 1 exact-match
set local-preference 20

```

|                            |         |
|----------------------------|---------|
|                            |         |
| <b>match as-path</b>       | AS_PATH |
| <b>match metric</b>        |         |
| <b>match origin</b>        |         |
| <b>set as-path prepend</b> | AS_PATH |
| <b>set metric</b>          |         |
| <b>set metric-type</b>     |         |

### 36.1.16 match interface

```

interface no match

```

**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          RIP
                OSPF
                route maps
          1          match          1
set          match          set
```

```
          OSPF          RIP
fastethernet 0/0  RIP
```

```
router ospf
redistribute rip subnets route-map redrip
network 192.168.12.0 0.0.0.255 area 0
```

```
route-map redrip permit 10
match interface fastethernet 0/0
```

| <b>match ip address</b>      |  |
|------------------------------|--|
| <b>match ip next-hop</b>     |  |
| <b>match ip route-source</b> |  |
| <b>match metric</b>          |  |
| <b>match route-type</b>      |  |
| <b>match tag</b>             |  |
| <b>set metric</b>            |  |
| <b>set metric-type</b>       |  |
| <b>set tag</b>               |  |

---

## 36.1.17 match ip address

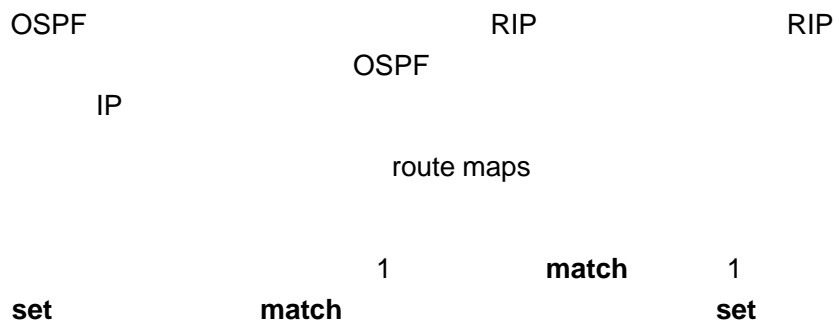
**match ip address**                      **no**

**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>                  |  |
| <i>access-list-name</i>                    |  |
| <b>prefix-list</b> <i>prefix-list-name</i> |  |

**match ip address**



---

```

                                OSPF          RIP
                                10  RIP      OSPF
                                type-1      40

```

```

router ospf
redistribute rip subnets route-map redrip
network 192.168.12.0 0.0.0.255 area 0
access-list 10 permit 200.168.23.0
route-map redrip permit 10
match ip address 10
set metric 40
set metric-type type-1

```

|                              |  |
|------------------------------|--|
|                              |  |
| <b>access-list</b>           |  |
| <b>match interface</b>       |  |
| <b>match ip next-hop</b>     |  |
| <b>match ip route-source</b> |  |
| <b>match metric</b>          |  |
| <b>match route-type</b>      |  |
| <b>match tag</b>             |  |
| <b>set metric</b>            |  |
| <b>set metric-type</b>       |  |
| <b>set tag</b>               |  |

### 36.1.18 match ip next-hop

```

IP
match ip next-hop no

```

```

match ip next-hop {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...]}

```

```

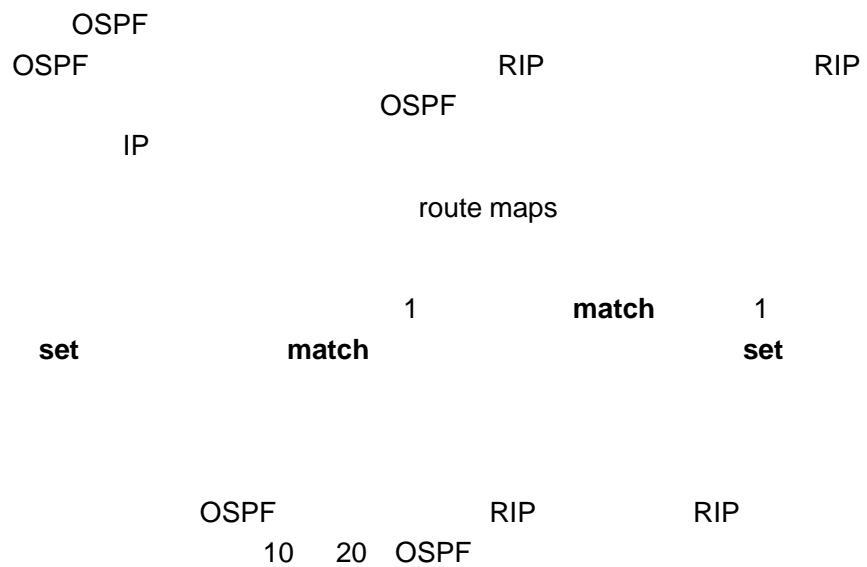
no match ip next-hop {access-list-number [access-list-number... |
access-list-name...] | access-list-name [access-list-number... |
access-list-name] | prefix-list prefix-list-name [prefix-list-name...]}

```

---

|                                            |  |
|--------------------------------------------|--|
|                                            |  |
| <i>access-list-number</i>                  |  |
| <i>access-list-name</i>                    |  |
| <b>prefix-list</b> <i>prefix-list-name</i> |  |

**match ip next-hop**



```

router ospf
redistribute rip subnets route-map redrip
network 192.168.12.0 0.0.0.255 area 0
access-list 10 permit 192.168.100.1
access-list 20 permit 172.16.10.1
route-map redrip permit 10
match ip next-hop 10 20

```

|  |  |
|--|--|
|  |  |
|--|--|

---

|                              |  |
|------------------------------|--|
| <b>match ip address</b>      |  |
| <b>match interface</b>       |  |
| <b>match ip route-source</b> |  |
| <b>match metric</b>          |  |
| <b>match route-type</b>      |  |
| <b>match tag</b>             |  |
| <b>set metric</b>            |  |
| <b>set metric-type</b>       |  |
| <b>set tag</b>               |  |

### 36.1.19 match ip route-source

IP

**match ip route-source**                      **no**

**match ip route-source** {*access-list-number* [*access-list-number...* | *access-list-name...*] | *access-list-name* [*access-list-number...* | *access-list-name*] | **prefix-list** *prefix-list-name* [*prefix-list-name...*]}

**no match ip route-source** {*access-list-number* [*access-list-number...* | *access-list-name...*] | *access-list-name* [*access-list-number...* | *access-list-name*] | **prefix-list** *prefix-list-name* [*prefix-list-name...*]}

|                                            |  |
|--------------------------------------------|--|
|                                            |  |
| <i>access-list-number</i>                  |  |
| <i>access-list-name</i>                    |  |
| <b>prefix-list</b> <i>prefix-list-name</i> |  |

**match ip route-source**

---

OSPF

RIP

RIP

OSPF

IP

route maps

**set**

**match**

1

**match**

1

**set**

OSPF

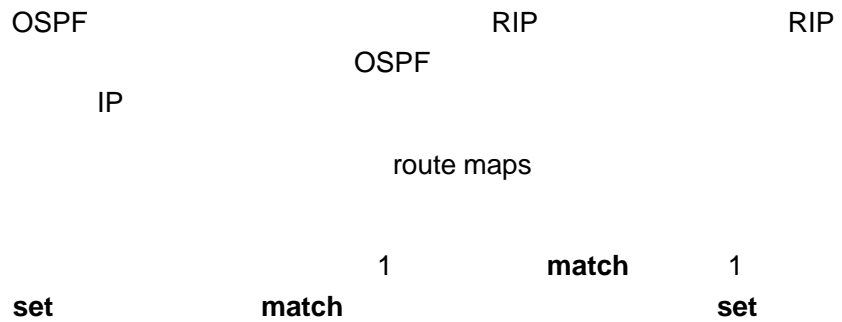
RIP

---

**match ipv6 address** { *access-list-name* | **prefix-list** *prefix-list-name* }

**no match ipv6 address**

|                                            |      |
|--------------------------------------------|------|
|                                            |      |
| <i>access-list-name</i>                    |      |
| <b>prefix-list</b> <i>prefix-list-name</i> | IPv6 |



```
10 OSPF
type-1 RIP OSPF
40 OSPF
RIP
```

```
ipv6 router ospf
 redistribute rip subnets route-map redrip
 ipv6 access-list v6acl
 10 permit ipv6 2620::/64 any
 route-map redrip permit 10
 match ipv6 address v6acl
 set metric 30
```

---

|                                |      |
|--------------------------------|------|
|                                |      |
| <b>ipv6 access-list</b>        | IPv6 |
| <b>match interface</b>         |      |
| <b>match ipv6 next-hop</b>     | IPv6 |
| <b>match ipv6 route-source</b> | IPv6 |
| <b>match metric</b>            |      |
| <b>match route-type</b>        |      |
| <b>match tag</b>               |      |
| <b>set metric</b>              |      |
| <b>set metric-type</b>         |      |
| <b>set tag</b>                 |      |

### 36.1.21 match ipv6 next-hop

IPv6

**match ipv6 address**                    **no**

**match ipv6 next-hop** { *access-list-name* | **prefix-list** *prefix-list-name* }

**no match ipv6 next-hop**

|                                            |      |
|--------------------------------------------|------|
|                                            |      |
| <i>access-list-name</i>                    |      |
| <b>prefix-list</b> <i>prefix-list-name</i> | IPv6 |

---

|                                |  |  |
|--------------------------------|--|--|
|                                |  |  |
|                                |  |  |
|                                |  |  |
| <b>match ipv6 route-source</b> |  |  |
|                                |  |  |
|                                |  |  |
|                                |  |  |
|                                |  |  |
|                                |  |  |

---

## 36.1.22 match ipv6 route-source

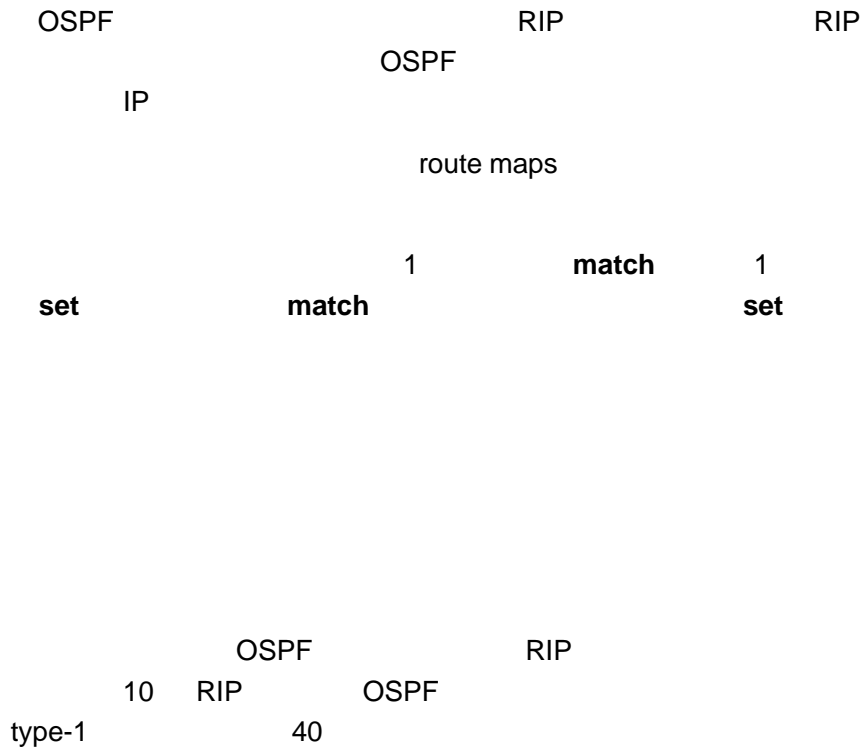
IPv6

**match ipv6 address** **no**

**match ipv6 route-source** { *access-list-name* | **prefix-list** *prefix-list-name* }

**no match ipv6 route-source**

|                                            |      |
|--------------------------------------------|------|
|                                            |      |
| <i>access-list-name</i>                    |      |
| <b>prefix-list</b> <i>prefix-list-name</i> | IPv6 |



```

ipv6 router ospf
redistribute rip subnets route-map redrip
ipv6 access-list v6acl
10 permit ipv6 5200::/64 any
route-map redrip permit 10
match ipv6 route-source v6acl
set metric 50

```

| <b>ipv6 access-list</b>        | IPv6 |
|--------------------------------|------|
| <b>match interface</b>         |      |
| <b>match ipv6 address</b>      | IPv6 |
| <b>match ipv6 route-source</b> | IPv6 |
| <b>match metric</b>            |      |
| <b>match route-type</b>        |      |
| <b>match tag</b>               |      |
| <b>set metric</b>              |      |
| <b>set metric-type</b>         |      |
| <b>set tag</b>                 |      |

### 36.1.23 match length

**length** **IP** **match**  
**length** **no**

**match length** *min-length max-length*  
**no match length** *min-length max-length*

| <i>min-length</i> | IP |
|-------------------|----|
| <i>max-length</i> | IP |

---

1

serial 1/0 500  
fastethernet 1/0

```
interface fastethernet 1/0  
ip policy route-map smallpak
```

```
route-map smallpak permit 10  
match length 0 500  
set interface fastethernet 0/0
```

| <b>route-map</b>               |    |
|--------------------------------|----|
| <b>match ip address</b>        |    |
| <b>set default interface</b>   |    |
| <b>set interface</b>           |    |
| <b>set ip default next-hop</b> | IP |
| <b>set ip next-hop</b>         | IP |
| <b>set ip precedence</b>       | IP |

### 36.1.24 match metric

no match metric

---

**match metric** *metric*

**no match metric**



---

|                       |  |
|-----------------------|--|
| match ip next-hop     |  |
| match ip route-source |  |
| match route-type      |  |
| match tag             |  |

set ip precedence C2\_0 1 Tf0 Tc 0 Tw 14.663 0.017 Td1412135447A107DA13D7143C32B0

¿

```

match origin incomplete
set community no-export

```

| <b>match as-path</b>       | AS_PATH |
|----------------------------|---------|
| <b>match metric</b>        |         |
| <b>match origin</b>        |         |
| <b>set as-path prepend</b> | AS_PATH |
| <b>set metric</b>          |         |
| <b>set origin</b>          |         |

### 36.1.26 match route-type

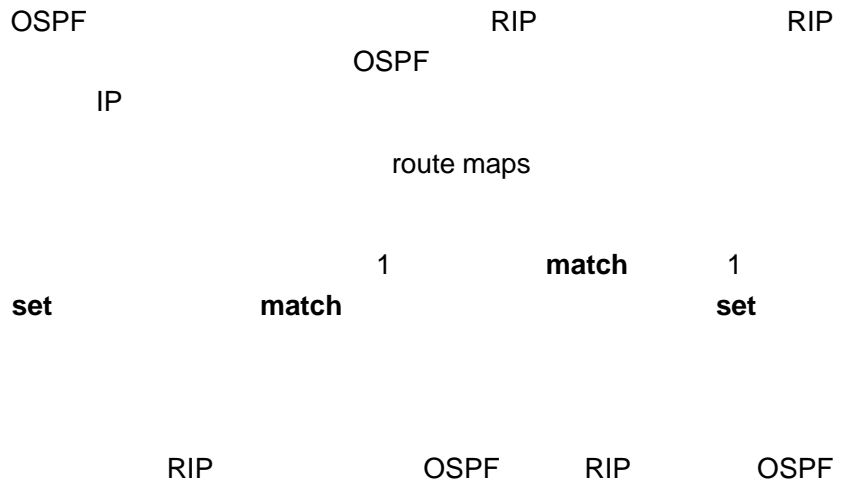
**match route-type**

**no**

**match route-type** {local | internal | external [type-1 | type-2] | level-1 | level-2}

**no match route-type** {local | internal | external [type-1 | type-2] | level-1 | level-2}

| <b>local</b>             |             |
|--------------------------|-------------|
| <b>Internal</b>          | OSPF        |
| <b>external</b>          | (BGP OSPF ) |
| <b>type-1   type-2</b>   | OSPF 1 2    |
| <b>level-1   level-2</b> | ISIS 1 2    |



```

router rip
redistribute ospf route-map redrip
network 192.168.12.0

route-map redrip permit 10
match route-type internal
  
```

| <b>access-list</b>           |  |
|------------------------------|--|
| <b>match ip address</b>      |  |
| <b>match interface</b>       |  |
| <b>match ip next-hop</b>     |  |
| <b>match ip route-source</b> |  |
| <b>match metric</b>          |  |
| <b>match tag</b>             |  |
| <b>set metric</b>            |  |
| <b>set metric-type</b>       |  |
| <b>set tag</b>               |  |

### 36.1.27 match tag

```

match tag no
  
```

---

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

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

|            |  |
|------------|--|
|            |  |
| <i>tag</i> |  |

**match tag**

tag

OSPF

OSPF

RIP

RIP

---

|                              |  |
|------------------------------|--|
| <b>match interface</b>       |  |
| <b>match ip route-source</b> |  |
| <b>match metric</b>          |  |
| <b>match ip next-hop</b>     |  |
| <b>match route-type</b>      |  |
| <b>set metric</b>            |  |
| <b>set metric-type</b>       |  |
| <b>set tag</b>               |  |

### 36.1.28 maximum-paths

no

**maximum-paths**

---

## 36.1.29 route-map

route-map

no

**route-map** *route-map-name* [**permit** | **deny**] [*sequence-number*]

**no route-map** *route-map-name* [**permit** | **deny**] [*sequence-number*]

| <i>route-map-name</i>  |                                       |
|------------------------|---------------------------------------|
| <b>permit</b>          | match permit set set permit match set |
| <b>deny</b>            | match deny deny match set             |
| <i>sequence-number</i> |                                       |

RGIOS

---

OSPF

RIP

RIP

OSPF

IP

route maps

**set**

**match**

1

**match**

1

**set**

1)

10

*sequence-number*

---

|              |  |
|--------------|--|
|              |  |
| Redistribute |  |

### 36.1.30 set aggregator as

match AS  
**set aggregator as** no

**set aggregator as** *as-num ip\_addr*

**no set aggregator as** [*as-num ip\_addr*]

|                  |    |
|------------------|----|
|                  |    |
| <i>as-number</i> | AS |
| <i>ip_addr</i>   |    |

BGP

as,ip-addr

|                        |           |
|------------------------|-----------|
| <b>set community</b>   | COMMUNITY |
| <b>set metric</b>      |           |
| <b>set metric-type</b> |           |

### 36.1.31 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

```

```

route-map set-as-path
match as-path 1
set as-path prepend 100 101 102

```

|                        |           |
|------------------------|-----------|
|                        |           |
| <b>match as-path</b>   | AS_PATH   |
| <b>match community</b> |           |
| <b>match metric</b>    |           |
| <b>match origin</b>    |           |
| <b>set community</b>   | COMMUNITY |
| <b>set metric</b>      |           |



---

| <b>match as-path</b>        | AS_PATH |
|-----------------------------|---------|
| <b>match metric</b>         |         |
| <b>match origin</b>         |         |
| <b>set as-path prepend</b>  | AS_PATH |
| <b>set local-preference</b> |         |
| <b>set metric-type</b>      |         |

### 36.1.33 set community

match COMMUNITY  
**set community no**

**set community** {*community-number*[*community-number ...*] **additive**

```

match as-path 1
set community 109:10

```

```

route-map SET_COMMUNITY 20 permit
match as-path 2
set community no-export

```

| <b>match as-path</b>       | AS_PATH |
|----------------------------|---------|
| <b>match community</b>     |         |
| <b>match metric</b>        |         |
| <b>match origin</b>        |         |
| <b>set as-path prepend</b> | AS_PATH |
| <b>set origin</b>          |         |
| <b>set metric-type</b>     |         |

### 36.1.34 set dampening

```

match set
dampening no

```

```

set dampening half-life reuse suppress max-suppress-time
no set dampening

```

| <i>half-life</i>         | 1..45( ) 15            |
|--------------------------|------------------------|
| <i>reuse</i>             | 1..20000 750           |
| <i>suppress</i>          | 1..20000 2000          |
| <i>max-suppress-time</i> | 1..255( ) 4* half-life |

---

```

route-map tag
match as path 10
set dampening 30 1500 10000 120

```

```

router bgp 100
neighbor 172.16.233.52 route-map tag in

```

| <b>match as-path</b>        | AS_PATH |
|-----------------------------|---------|
| <b>match community</b>      |         |
| <b>match metric</b>         |         |
| <b>match origin</b>         |         |
| <b>set as-path prepend</b>  | AS_PATH |
| <b>set metric</b>           |         |
| <b>set local-preference</b> |         |

### 36.1.35 set extcommunity

```

match
set extcommunity no

```

```

set extcommunity {rt extend-community-value | soo
extend-community-value}

```

```

no set extcommunity {rt | soo}

```

| <b>rt</b>  | RT  |
|------------|-----|
| <b>soo</b> | SOO |

---

|                               |              |
|-------------------------------|--------------|
| <i>extend-community-value</i> | 5'D-vp04+@zä |
|-------------------------------|--------------|

---

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

|                                |      |        |
|--------------------------------|------|--------|
| set                            | WCMP | WCMP   |
|                                |      | weight |
|                                | WCMP |        |
| <b>set ip default next-hop</b> | IP   | 32     |

---

```
access-list 1 permit ip 1.1.1.1 0.0.0.0
access-list 2 permit ip 2.2.2.2 0.0.0.0
```

```
interface async 1
ip policy route-map equal-access
```

```
route-map equal-access permit 10
match ip address 1
set ip default next-hop 6.6.6.6
route-map equal-access permit 20
match ip address 2
set ip default next-hop 7.7.7.7
route-map equal-access permit 30
set default interface null0
```

|                         |  |
|-------------------------|--|
|                         |  |
| <b>route-map</b>        |  |
| <b>match ip address</b> |  |

---

|                                |    |
|--------------------------------|----|
|                                |    |
| <b>route-map</b>               |    |
| <b>match ip address</b>        |    |
| <b>set default interface</b>   |    |
| <b>set default interface</b>   |    |
| <b>set interface</b>           |    |
| <b>set ip default next-hop</b> | IP |
| <b>set ip precedence</b>       | IP |

### 36.1.38 set ip next-hop

match
IP  
**set ip next-hop** no

**set ip next-hop** *ip-address* [*weight*] [...*ip-address* [*weight*]  
**no set ip next-hop** *ip-address* [*weight*] [...*ip-address* [*weight*]

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

---

```

      set
      WCMP
      WCMP
      set ip next-hop
      ip address
      next-hop
      next-hop
      WCMP
      weight
      weight
      weight
      next-hop
      set
      WCMP
      weight
      weight
      1
      match
  
```

1

set

```

      serial 1/0
      10.0.0.0/8
      172.16.0.0/16
      192.168.100.1
      172.16.100.1
  
```

```

interface serial 1/0
ip policy route-map load-balance
  
```

```

access-list 10 permit 10.0.0.0 0.255.255.255
access-list 20 permit 172.16.0.0 0.0.255.255
  
```

```

route-map load-balance permit 10
match ip address 10
set ip next-hop 192.168.100.1
  
```

```

route-map load-balance permit 20
match ip address 20
set ip next-hop 172.16.100.1
  
```

```

route-map load-balance permit 30
set interface Null0
  
```

---

|                                |    |
|--------------------------------|----|
|                                |    |
| <b>route-map</b>               |    |
| <b>match ip address</b>        |    |
| <b>set default interface</b>   |    |
| <b>set default interface</b>   |    |
| <b>set interface</b>           |    |
| <b>set ip default next-hop</b> | IP |
| <b>set ip precedence</b>       | IP |

### 36.1.39 set ip next-hop verify-availability

IP

**next-hop verify-availability**      **no**      **set ip**

---

```

ip policy route-map load-balance

access-list 10 permit 10.0.0.0 0.255.255.255
access-list 20 permit 172.16.0.0 0.0.255.255

route-map load-balance permit 10
match ip address 10
set ip next-hop 192.168.100.1

route-map load-balance permit 20
match ip address 20
set ip next-hop 172.16.100.1

route-map load-balance permit 30
set interface Null0

```

|                                |    |
|--------------------------------|----|
|                                |    |
| <b>route-map</b>               |    |
| <b>match ip address</b>        |    |
| <b>set default interface</b>   |    |
| <b>set default interface</b>   |    |
| <b>set interface</b>           |    |
| <b>set ip default next-hop</b> | IP |
| <b>set ip precedence</b>       | IP |

### 36.1.40 set level

```

match
set level          no

set level {level 1 | level 2 | level 1-2 | stub-area | backbone}
no set level

```

---

OSPF

RIP

backbone

```
router ospf
redistribute rip subnets route-map redrip
network 192.168.12.0 0.0.0.255 area 0

route-map redrip permit 10
set level backbone
```

| <b>match interface</b>       |  |
|------------------------------|--|
| <b>match ip address</b>      |  |
| <b>match ip next-hop</b>     |  |
| <b>match ip route-source</b> |  |
| <b>match metric</b>          |  |
| <b>match route-type</b>      |  |
| <b>match tag</b>             |  |
| <b>set metric-type</b>       |  |
| <b>set tag</b>               |  |

### 36.1.41 set local-preference

```
match LOCAL_PREFERENCE
set local-preference no
```

```
set local-preference number
```

```
no set local-preference
```

| <i>number</i> | 0..4294967295 |
|---------------|---------------|



---

---

|                  |  |
|------------------|--|
| <b>match tag</b> |  |
|------------------|--|

**set metric-type**

|                |  |  |
|----------------|--|--|
| <b>set tag</b> |  |  |
|----------------|--|--|

---

```

route-map redrip permit 10
set metric-type type-1

```

|                              |  |
|------------------------------|--|
|                              |  |
| <b>match interface</b>       |  |
| <b>match ip address</b>      |  |
| <b>match ip next-hop</b>     |  |
| <b>match ip route-source</b> |  |
| <b>match metric</b>          |  |
| <b>match route-type</b>      |  |
| <b>match tag</b>             |  |
| <b>set metric</b>            |  |
| <b>set tag</b>               |  |

### 36.1.44 set next-hop

```

match IP
set next-hop no

```

```

set next-hop ip-address
no set next-hop ip-address

```

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



---

|                   |     |
|-------------------|-----|
| <b>egp</b>        | EGP |
| <b>igp</b>        | IGP |
| <b>Incomplete</b> |     |

```

route-map SET_ORIGIN 10 permit
match as-path 1
set origin igp
route-map SET_ORIGIN 20 permit
match as-path 2
set origin egp

```

|                             |         |
|-----------------------------|---------|
|                             |         |
| <b>match as-path</b>        | AS_PATH |
| <b>match metric</b>         |         |
| <b>match origin</b>         |         |
| <b>set as-path prepend</b>  | AS_PATH |
| <b>set metric</b>           |         |
| <b>set local-preference</b> |         |

### 36.1.46 set originator-id

```

match
set originator-id no
set originator-id ip-addr
no originator-id [ip-addr]

```



---

|            |  |
|------------|--|
|            |  |
| <i>tag</i> |  |

OSPF                      RIP  
 100

```

router ospf
redistribute rip subnets route-map redrip
network 192.168.12.0 0.0.0.255 area 0
route-map redrip permit 10
set tag 100
  
```

|                              |  |
|------------------------------|--|
|                              |  |
| <b>match interface</b>       |  |
| <b>match ip address</b>      |  |
| <b>match ip next-hop</b>     |  |
| <b>match ip route-source</b> |  |
| <b>match metric</b>          |  |
| <b>match route-type</b>      |  |
| <b>match tag</b>             |  |
| <b>set metric</b>            |  |
| <b>set metric-type</b>       |  |

### 36.1.48 set weight

match BGP  
**set weight** no  
**set weight** *number*  
**no set weight**

|               |           |
|---------------|-----------|
|               |           |
| <i>number</i> | 0...65535 |

BGP

neighbor weight  
32768

BGP

1.1.1.1 BGP in 100

```

router bgp 1
neighbor 1.1.1.1 route-map nei-rmap-in in
route-map nei-rmap-in permit 10
set weight 100

```

|                        |           |
|------------------------|-----------|
|                        |           |
| <b>match as-path</b>   | AS_PATH   |
| <b>match community</b> |           |
| <b>match metric</b>    |           |
| <b>match origin</b>    |           |
| <b>set community</b>   | COMMUNITY |
| <b>set metric</b>      |           |

---

|                 |  |
|-----------------|--|
| set metric-type |  |
|-----------------|--|

**36.1.49 ip ref ecmp load-balance source**

ECMP/WCMP

HASH(KEY(SIP,[DIP] [TCP/UDP Port] [ UDF]))

Hash

|             |     |             |                     |
|-------------|-----|-------------|---------------------|
| HASH        | 2   | CRC32_Upper |                     |
| CRC32_Lower | KEY | KEY         | @@@HASH() Td(KEY)Tj |

---

## 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 | deny permit<br>set |
| Set clauses   | match              |

## 36.2.2 show ip community-list

**show ip community-list** [*community-list-number*|*community-list-name*]

---

|                              |  |
|------------------------------|--|
|                              |  |
| <i>community-list-number</i> |  |
| <i>community-list-name</i>   |  |

```
Ruijie# show ip community-list
Community-list standard local
permit local-AS
Community-list standard Red-Giant
permit 0:10
deny 0:20
```

### 36.2.3 show ip prefix-list

**show ip prefix-list**

**show ip prefix-list [ *prefix-name* ]**

|             |  |
|-------------|--|
|             |  |
| prefix-name |  |

---

```
Ruijie# show ip prefix-list
ip prefix-list pre: 2 entries
seq 5 permit 192.168.64.0/24
seq 10 permit 192.2.2.0/24
```

### 36.2.4 show ip route

IP **show ip route**

**show ip route** [[vrf *vrf\_name*] [*network* [*mask*] | **count** | **protocol** [*process-id*] | **weight** ]]

|                            |                                                                   |
|----------------------------|-------------------------------------------------------------------|
|                            |                                                                   |
| <b>vrf</b> <i>vrf_name</i> | VRF                                                               |
| <i>network</i>             |                                                                   |
| <i>mask</i>                |                                                                   |
| <b>count</b>               |                                                                   |
| <b>protocol</b>            | <b>static</b><br><b>connected,</b><br><b>bgp, isis, ospf, rip</b> |
| <i>process-id</i>          |                                                                   |
| <b>weight</b>              |                                                                   |

**show ip route**

---

Ruijie# **show ip route**

Codes: C - connected, S - static, R - RIP, B - BGP  
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  
i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2  
- IS-IS level-2  
ia - IS-IS inter area, \* - candidate default

Gateway of last resort is no set

S 20.0.0.0/8 is directly connected, VLAN 1  
S 22.0.0.0/8 [1/0] via 20.0.0.1  
O E2 30.0.0.0/8 [110/20] via 192.1.1.1, 00:00:06, VLAN  
1  
R 40.0.0.0/8 [120/20] via 192.1.1.2, 00:00:23, VLAN  
1  
~~B 50.0.0.0/8 [120/0] via 192.1.1.3, 00:00:41~~  
C 192.1.1.0/24 is directly connected, VLAN 1  
C 192.1.1.254/32 is local host.

**show ip route**

| O  | C<br>S<br>R RIP<br>B BGP<br>O OSPF                            |                 |
|----|---------------------------------------------------------------|-----------------|
|    | i IS-IS                                                       |                 |
| E2 | E1 OSPF<br>E2 OSPF<br>N1 OSPF NSSA<br>N2 OSPF NSSA<br>IA OSPF | 1<br>2<br>IS-IS |

---

|              |    |
|--------------|----|
| Via 20.0.0.1 | IP |
| 00:00:06     |    |
| VLAN 1       |    |

**show ip route network**

```
Ruijie# show ip route 30.0.0.0
Routing entry for 30.0.0.0/8
Distance 110, metric 20
Routing Descriptor Blocks:
*192.1.1.1, 00:01:11 ago, via VLAN 1, generated by OSPF,
extern 2
```

**show ip route network**



---

## IPv6

```
Ruijie# show ipv6 prefix-list  
ipv6 prefix-list p6: 2 entries  
permit 13::/20  
permit 14::/20
```

---

|           |  |
|-----------|--|
| adj_nodes |  |
| res_adj   |  |

---

# 37

## 37.1

### 37.1.1 ip policy route-map

**ip policy route-map**

**no**

**ip policy route-map** *route-map*

**no ip policy route-map**

|                  |  |
|------------------|--|
|                  |  |
| <i>route-map</i> |  |

1

ACL

ACL

ACL

---

---

---

```

                                FE0
10.0.0.1                        196.168.4.6                20.0.0.1
                                196.168.5.6

```

```

access-list 1 permit 10.0.0.1
access-list 2 permit 20.0.0.1
route-map lab1 permit 10
match ip address 1
set ip next-hop 196.168.4.6
exit
route-map lab1 permit 20
match ip address 2
set ip next-hop 196.168.5.6
exit
interface FastEthernet 0/0
ip policy route-map lab1
exit

```

| access-list             |              |
|-------------------------|--------------|
| route-map               |              |
| set ip next-hop         |              |
| set ip default next-hop |              |
| set ip dscp             | IP      DSCP |
| match ip address        |              |
| match length            |              |

route-map

### 37.1.2 ip policy

```

set ip next-hop
ip policy                      no

```

```

ip policy {load-balance|redundance}
no ip policy

```



# 38 IPv6

## 38.1

IPv6

- ' ping ipv6
- ' ipv6 address
- ' ipv6 enable
- ' ipv6 hop-limit
- ' ipv6 neighbor
- ' ipv6 source-route
- ' ipv6 route
- ' ipv6 ns-linklocal-src
- ' ipv6 nd ns-interval
- ' ipv6 nd reachable-time
- ' ipv6 nd prefix
- ' ipv6 nd ra-lifetime
- ' ipv6 nd ra-interval
- ' ipv6 nd ra-hoplimit
- ' ipv6 nd ra-mtu
- ' ipv6 nd managed-config-flag
- ' ipv6 nd other-config-flag
- ' ipv6 nd dad attempts
- ' ipv6 nd suppress-ra
- ' ipv6 redirects
- ' clear ipv6 neighbors
- ' tunnel destination
- ' tunnel mode ipv6ip
- ' tunnel source
- ' tunnel ttl

### 38.1.1 ping ipv6

## IPV6

**ping ipv6** [*ipv6-address*]

*ipv6-address*

ping

| ! |                  |
|---|------------------|
| . |                  |
| U |                  |
| R |                  |
| F |                  |
| A |                  |
| D | Down<br>IPV6 ( ) |
| ? |                  |

Ruijie# **ping ipv6 fec0::1**

### 38.1.2 ipv6 address

IPV6 , no

**ipv6 address** *ipv6-prefix/prefix-length* [eui-64]

**no ipv6 address** [*ipv6-prefix/prefix-length*] [eui-64]

*ipv6-prefix* IPV6 , RFC2373  
16

*prefix-length* IPV6 IPV6

S86 IPv6 [0,64] [128,128]

---

**eui-64** IPV6 64 ID

eui-64 64 IPV6  
Up

**no ipv6 address**

**no ipv6 address ipv6-prefix/prefix-length eui-64**  
**ipv6 address ipv6-prefix/prefix-length eui-64**

```
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::1/64 eui-64
Ruijie(config-if)# no ipv6 address 2002:1::1/64 eui-64 X IPV6
```

**ipv6 enable**

**no ipv6 enable**

IPv6

2

,

IP  
IP

IPv6

IPv6

```
hardware-address          XXXX.XXXX.XXXX
48  MAC  'X'
```

```

                    ARP                    IPV6
                    NDP
                    Reachble
clear ipv6 neighbors      ( NDP)
```

**show ipv6 neighbors**

```
Ruijie(config)# ipv6 neighbor 2001::1 vlan 1
00d0.f811.1111
```

|                             |  |
|-----------------------------|--|
|                             |  |
| <b>show ipv6 interface</b>  |  |
| <b>clear ipv6 neighbors</b> |  |

### 38.1.6 ipv6 source-route

```
IPv6          no
IPv6          -  !
```

0

IPv6

0

IPv6

```
Ruijie(config)# no ipv6 source-route
```

### 38.1.7 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]}
```

```
ipv6-prefix IPV6
```

RFC2373

```
prefix-length IPV6
```

'/'

---

```
S86
```

[0,64]

[128,128]

---

```
ipv6-address
```

RFC2373

```
interface-id
```

Ruijie(config)# **ipv6 route 2001::/64 vlan 1 2005::1**

|                        |      |
|------------------------|------|
|                        |      |
| <b>show ipv6 route</b> | IPv6 |

### 38.1.8 ipv6 ns-linklocal-src

**no ipv6 ns-linklocal-src**

**ipv6 ns-linklocal-src**

**no ipv6 ns-linklocal-src**

Ruijie(config)# **no ipv6 ns-linklocal-src**

### 38.1.9 ipv6 nd ns-interval

(NS)

no

**ipv6 nd ns-interval *milliseconds***

**no ipv6 nd ns-interval**

milliseconds  
1000-4294672953600000

(RA) 0( )  
1000ms(1 )

(RA)

Ruijie(config-if)# **ipv6 nd ns-interval 2000**

|                            |  |
|----------------------------|--|
|                            |  |
| <b>show ipv6 interface</b> |  |

### 38.1.10 ipv6 nd reachable-time

NDP

no

**ipv6 nd reachable-time** *milliseconds*

**no ipv6 nd reachable-time**

*milliseconds*  
0-3600000

(RA) 0( )  
30000ms(30 )

```

(RA)
0
RFC4861
0.5 1.5

```

```
Ruijie(config-if)# ipv6 nd reachable-time 1000000
```

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

### 38.1.11 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 ] }

ipv6-prefix  IPV6          RFC2373
prefix-length  IPV6          '/'
valid-lifetime
preferred-lifetime
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

address (RA) ipv6

**ipv6 nd prefix default**

ipv6 nd prefix default

ipv6 nd prefix default

**at** *valid-date preferred-date*

2

0

SVI 1

Ruijie(config)#**interface vlan 1**

Ruijie(config-if)# **ipv6 nd prefix 2001::/64 infinite**  
2592000

SVI 1 ( )

Ruijie(config)# **interface vlan 1**

Ruijie(config-if)# **ipv6 nd prefix default no-autoconfig**

|                            |         |
|----------------------------|---------|
|                            |         |
| <b>show ipv6 interface</b> | ra-info |

### 38.1.12 ipv6 nd ra-lifetime

```

(RA)
no
ipv6 nd ra-lifetime seconds
no ipv6 nd ra-lifetime

seconds                                0-9000

1800

```

```

“ ” (RA)

0 (RA) 0 (ra-interval)

```

```

Ruijie(config)# interface vlan 1
Ruijie(config-if)# ipv6 nd ra-lifetime 2000

```

|                            |         |
|----------------------------|---------|
|                            |         |
| <b>show ipv6 interface</b> | ra-info |
| <b>ipv6 nd ra-interval</b> |         |
| <b>ipv6 nd ra-hoplimit</b> |         |
| <b>ipv6 nd ra-mtu</b>      | MTU     |

### **38.1.13 ipv6 nd ra-interval**

(RA)

## **38.1.14 ipv6 nd ra-hoplimit**



```
Ruijie(config)# int vlan 1  
Ruijie(config)# ipv6 nd managed-config-flag
```



```
show ipv6 interface
```

|                            |  |
|----------------------------|--|
|                            |  |
| <b>show ipv6 interface</b> |  |

### 38.1.18 ipv6 nd suppress-ra

```

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

```

IPv6

ipv6 suppress-ra

```

Ruijie(conifgf)# interface vlan 1
Ruijie(config-if)# ipv6 nd suppress-ra

```

|                            |         |
|----------------------------|---------|
|                            |         |
| <b>show ipv6 interface</b> | ra-info |

### 38.1.19 ipv6 redirects

```

IPV6
ICMPv6
no ICMPv6
ipv6 redirects
no ipv6 redirects

```

IPV6

ICMPv6

```

ICMPv6
  100      ICMPv6      (100pps)
    
```

```

Ruijie(config)# interface vlan 1
Ruijie(config-if)# ipv6 redirects
    
```

|                            |  |
|----------------------------|--|
|                            |  |
| <b>show ipv6 interface</b> |  |

### 38.1.20 clear ipv6 neighbors

```

clear ipv6 neighbors
    
```

RDP

```

Ruijie# clear ipv6 neighbors
    
```

|                            |  |
|----------------------------|--|
|                            |  |
| <b>ipv6 neighbor</b>       |  |
| <b>show ipv6 neighbors</b> |  |

### 38.1.21 tunnel mode ipv6ip

```

IPv6      IPV6      ,      no
    
```

**tunnel mode ipv6ip [6to4 | isatap]**

**no tunnel mode**

**6to4**

6to4

**isatap**

ISATAP

IPv6

(6to4 isatap)

IPv6 :

Ruijie(config)# **interface tunnel**

---

*interface-type interface-number*

IPv4

IPv4

IPv4 , IPv4  
( 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
```

|                           |     |
|---------------------------|-----|
|                           |     |
| <b>tunnel mode</b>        |     |
| <b>tunnel destination</b> |     |
| <b>tunnel ttl</b>         | TTL |

### 38.1.24 tunnel ttl

IPv6 IPv4 TTL , no  
128

**tunnel ttl value**

**no tunnel ttl**

*value* TTL

128

IPv6      IPv4      TTL

```
Ruijie(config)# interface tunnel 1  
Ruijie(config-if)# tunnel ttl 64
```

| <b>tunnel mode</b>        |  |
|---------------------------|--|
| <b>tunnel source</b>      |  |
| <b>tunnel destination</b> |  |

## 38.2

### 38.2.1 show ipv6 route

IPV6

**show ipv6 route [static**

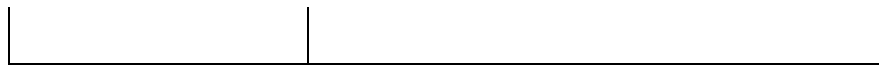
```
Ruijie# show ipv6 route
Codes: C - Connected, L - Local, S - Static, R - RIP,
B - BGP
      I1 - ISIS L1, I2 - ISIS L2, IA - IIS interarea
L   ::1/128
    via ::1, loopback 0
C   fa::/64
    via ::, vlan 1
L   fa::1/128
    via ::, loopback 0
C   2001::/64
    via ::, vlan 2
L   2001::1/128
    via ::, loopback 0
L   fe80::/10
    via ::1, Null0
C   fe80::/64
    via ::, vlan 1
```

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
```

```
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                                                                                                                                                                                                                                                                                                           |
| Interface      |                                                                                                                                                                                                                                                                                                               |
| State          | : state/H(R)<br>STATE :<br>INCOMP( Incomplete)—<br>(NS)<br>(NA).<br>REACH(Reachable) —<br><br>STALE—<br><br>NUD(Neighbor<br>Unreachability Detection)<br>DELAY— STALE<br>STALE DELAY<br>DELAY_FIRST_PROBE_TIME seconds(5 )<br><br>DELAY PROBE<br>(NS) NUD.<br>PROBE— NUD<br>RetransTimer milliseconds<br>(NS) |



```
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]
```

```

ND advertised reachable time is 0 milliseconds
ND advertised retransmit time is 0 milliseconds
ND advertised CurHopLimit is 64
Prefixes: (total: 1)
fec0:1:1:1::/64(Def,Auto,vltime: 2592000, pltime:
604800, flags: LA)
    
```

**ra-info**

|                          |                                 |
|--------------------------|---------------------------------|
|                          |                                 |
| RA timer is stopped (on) |                                 |
| waits                    |                                 |
| initcount                | RA                              |
| RA(out/in/inconsistent)  | out:<br>in:<br>inconsistent:    |
| RS(input)                |                                 |
| Link-layer address       |                                 |
| Physical MTU             | MTU                             |
| !M   M                   | !M<br>managed-config-flag<br>M: |
| !O   O                   | !O<br>other-config-flag<br>O:   |

**ra-info (Prefix)**

|                 |  |
|-----------------|--|
|                 |  |
| total           |  |
| fec0:1:1:1::/64 |  |

---

|            |                    |
|------------|--------------------|
| Def        |                    |
| Auto   CFG | Auto<br>IPV6 , CFG |
| !Adv       |                    |
| vlttime    | ( )                |
| pltime     | ( )                |
| L   !L     | L on-link<br>!L    |
| A   !A     | A auto-config , !A |

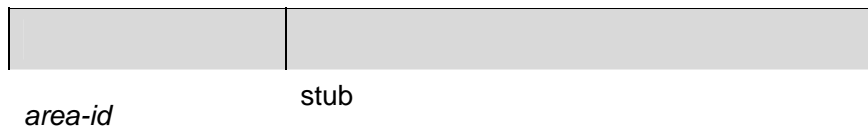
# 39 OSPFv3

## 39.1

### 39.1.1 area default-cost

stub ABR no stub NSSA

**area** *area-id* **default-cost** *cost*  
**no area** *area-id* **default-cost**



## 39.1.2 area range

no

**area** *area-id* **range** *ipv6-prefix/prefix-length* [**advertise**|**not-advertise**]

**no area** *area-id* **range** *ipv6-prefix/prefix-length*

| <i>area-id</i>                   | IPv4 |
|----------------------------------|------|
| <i>ipv6-prefix/prefix-length</i> |      |
| <b>not-advertise</b>             | A    |

```

no          stub          Stub
           stub          Stub
area area-id stub [no-summary]
no area area-id stub [no-summary]
    
```

|                   |      |      |                       |             |
|-------------------|------|------|-----------------------|-------------|
|                   |      |      |                       |             |
| <i>area-id</i>    | stub | NSSA |                       | IPv6        |
| <i>no-summary</i> |      | stub | ABR<br>3 LSA<br>3 LSA | ABR<br>stub |

Stub

OSPFv3

```

no area area-id stub
no area area-id ( )
stub ABR 3 LSA
stub NSSA ABR no-su
mmary 3 LSA NSSA
    
```

Stub 10 ABR Stub

```

ipv6 router ospf 1
area 10 stub
area 10 stub no-summary
    
```

|                            |        |
|----------------------------|--------|
|                            |        |
| <b>area default-cost</b>   | Stub   |
| <b>show ipv6 ospf area</b> | OSPFv3 |

### 39.1.4 area virtual-link

**no**

```

'                               stub          NSSA
'                               hello-interval  dead-interval
instance
'   no area area-id             (             )
    
```

---

```

ipv6 router ospf 1
area 1 virtual-link 192.1.1.1
    
```

| <b>show ipv6 ospf</b>               | OSPFv3 |
|-------------------------------------|--------|
| <b>show ipv6 ospf neighbor</b>      | OSPFv3 |
| <b>show ipv6 ospf virtual-links</b> | OSPFv3 |

### 39.1.5 auto-cost

OSPF

**no**

**auto-cost** [reference-bandwidth *ref-bw*]

**no auto-cost** [reference-bandwidth ]

| <b>reference-bandwidth</b> | Mbps                   |
|----------------------------|------------------------|
| <i>ref-bw</i>              | 1-4294967      100Mbps |

100Mbps

OSPFv3

**no auto-cost reference-bandwidth**

**ipv6 ospf cost**

10M

```

ipv6 router ospf 1
auto-cost reference-bandwidth 5

```

|                       |        |
|-----------------------|--------|
|                       |        |
| <b>ipv6 ospf cost</b> |        |
| <b>show ipv6 ospf</b> | OSPFv3 |

**39.1.6 clear ipv6 ospf process**

OSPF

```
clear ipv6 ospf {process | process-id}
```

|                   |                |
|-------------------|----------------|
|                   |                |
| <i>process-id</i> | ospf <1-65535> |

ospf

```

en
clear ipv6 ospf process

```

**39.1.7 default-information originate**

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**] [**route-map** *map-name*]

| <b>always</b>               | OSPF      |
|-----------------------------|-----------|
| <b>metric</b> <i>metric</i> | 1<br>OSPF |

**metric-type** *type*

default-information originate always

|                                |        |
|--------------------------------|--------|
|                                |        |
| <b>redistribute</b>            |        |
| <b>show ipv6 ospf</b>          | OSPFv3 |
| <b>show ipv6 ospf database</b> | OSPFv3 |

### 39.1.8 default-metric

**no**

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

**no default-metric**

|                     |               |
|---------------------|---------------|
|                     |               |
| <i>metric-value</i> | 1-16777214 20 |

20

OSPFv3

**redistribute**

1. **default-information originate**

2. 20

metric 10

default-metric 10

|                       |        |
|-----------------------|--------|
|                       |        |
| <b>redistribute</b>   |        |
| <b>show ipv6 ospf</b> | OSPFv3 |

### 39.1.9 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           |
| <b>area</b> <i>area-id</i>         | OSPFv3<br>IPv6 |
| <b>instance</b> <i>instance-id</i> | OSPFv3         |

```

router ospf      OSPFv3
no ipv6 ospf area      OSPFv3
no ipv6 router ospf   OSPFv3
                    instance-id
                    OSPFv3

                    int fastethernet 0/0      OSPFv3

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



### 39.1.11 ipv6 ospf dead-interval

```

hello                                no
ipv6 ospf dead-interval seconds [instance instance-id]
no ipv6 ospf dead-interval [instance instance-id]
    
```

|                                    |            |
|------------------------------------|------------|
|                                    |            |
| <i>seconds</i>                     | 1-65535( ) |
| <b>instance</b> <i>instance-id</i> | OSPFv3     |

```
ip ospf hello-interval 4
```

```
hello 4 hello
```

1. hello
- 2.

60s

```
ipv6 ospf dead-interval 60
```

|                                    |        |
|------------------------------------|--------|
|                                    |        |
| <b>ipv6 ospf hello-interval</b>    | Hello  |
| <b>show ipv6 ospf interface</b>    | OSPFv3 |
| <b>instance</b> <i>instance-id</i> | OSPFv3 |

### 39.1.12 ipv6 ospf hello-interval





## OSPFv3

```
ipv6 ospf network point-to-point
```

| <b>ipv6 ospf priority</b>          |        |
|------------------------------------|--------|
| <b>show ipv6 ospf interface</b>    | OSPFv3 |
| <b>instance <i>instance-id</i></b> | OSPFv3 |

**39.1.15 ipv6 ospf priority****no****ipv6 ospf priority**

```

DR/BDR( / )
DR/BDR DR BDR
Router-ID DR BDR
DR/BDR DR BDR
DR BDR
DR BDR
DR/BDR DR BDR
ipv6 ospf priority 0
    
```

|                                    |        |
|------------------------------------|--------|
|                                    |        |
| <b>ipv6 ospf network</b>           |        |
| <b>router-id</b>                   |        |
| <b>show ipv6 ospf interface</b>    | OSPFv3 |
| <b>instance <i>instance-id</i></b> | OSPFv3 |

### 39.1.16 ipv6 ospf retransmit-interval

```

LSA no
ipv6 ospf retransmit-interval seconds [instance instance-id]
no ipv6 ospf retransmit-interval [instance instance-id]
    
```

LSA

LSA

LSA

10s

`ipv6 ospf retransmit-interval 10`

|                                    |        |
|------------------------------------|--------|
|                                    |        |
| <b>show ipv6 ospf interface</b>    | OSPFv3 |
| <b>instance</b> <i>instance-id</i> | OSPFv3 |

### 39.1.17 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<br>1-65535( ) |
| <b>instance</b> <i>instance-id</i> | OSPFv3<br>0-255.  |

1

LSA

LSA

`ipv6 ospf transmit-delay 2`

|                                 |        |
|---------------------------------|--------|
|                                 |        |
| <b>show ipv6 ospf interface</b> | OSPFv3 |

### 39.1.18 ipv6 router ospf

OSPFv3

**no**

OSPFv3

**ipv6 router ospf** *process-id*  
**no ipv6 router ospf** *process-id*

|                   |      |
|-------------------|------|
|                   |      |
| <i>process-id</i> | OSPF |

OSPFv3

OSPFv3

OSPFv3

OSPFv3

ipv6 router ospf 1

|                       |        |
|-----------------------|--------|
|                       |        |
| <b>ipv6 ospf area</b> | OSPFv3 |
| <b>show ipv6 ospf</b> | OSPFv3 |

### 39.1.19 log-adj-changes

**no default**

**log-adj-changes [detail]**

**no log-adj-changes [detail]**

|               |  |
|---------------|--|
|               |  |
| <b>detail</b> |  |

FULL

```
Ruijie(config)# router ospf 1
Ruijie(config-router)# log-adj-changes detail
```

|                       |      |
|-----------------------|------|
|                       |      |
| <b>show ipv6 ospf</b> | ospf |

**39.1.20 max-concurrent-dd**

DD

**max-concurrent-dd** *number*  
**no max-concurrent-dd**

|               |            |
|---------------|------------|
|               |            |
| <i>number</i> | , 1-65535. |

```

max-concurrent-dd 4 4
DD
router ipv6 ospf 1
max-concurrent-dd 4
    
```

### 39.1.21 passive-interface

**no**

```

passive-interface {default | interface-type interface-number }
no passive-interface {default | interface-type interface-number }
    
```

| <i>default</i>                                   |  |
|--------------------------------------------------|--|
| <i>interface-type</i><br><i>interface-number</i> |  |

OSPFv3

hello

OSPF

VLAN1          OSPFv3

```

passive-interface default
no passive-interface vlan 1
    
```

| <b>ipv6 ospf area</b>          | OSPFv3 |
|--------------------------------|--------|
| <b>show ipv6 ospf</b>          | OSPFv3 |
| <b>show ipv6 ospf neighbor</b> | OSPFv3 |

### 39.1.22 redistribute

OSPFv3

**no**

**redistribute** *protocol* [**metric** *metric-value*] [**metric-type** *type-value*][**route-map** *map-tag*] [**match** [**internal** | [**external** | **nssa-external**

```

OSPF                                match                                OSPF
                                OSPF
                                route-map match
                                tag metric metric-type
route-map                          set
                                route-map test                        match
metric 20  set metric 30
redistribute connect metric 10 route-map test
                                metric 20 metric
30
    
```

|                                      |        |
|--------------------------------------|--------|
|                                      |        |
| <b>default-information originate</b> |        |
| <b>default-metric</b>                |        |
| <b>summary-prefix</b>                |        |
| <b>show ipv6 ospf</b>                | OSPFv3 |
| <b>show ipv6 ospf database</b>       | OSPFv3 |

### 39.1.23 router-id

```

                                (Router ID)                            no
Router ID                        Router ID
router-id router-id
no router-id
    
```

|                  |      |
|------------------|------|
|                  |      |
| <i>router-id</i> | IPv4 |

OSPFv3

OSPFv3

```
spf-delay 5
spf-holdtime 10
```

OSPFv3

```
spf-delay spf-holdtime OSPF
```

```
timers spf 2 4
```

| <b>clear ipv6 ospf</b> | OSPFv3 |
|------------------------|--------|
| <b>show ipv6 ospf</b>  | OSPFv3 |

## 39.2

### 39.2.1 show ipv6 ospf

OSPFv3

```
show ipv6 ospf [process-id]
```

| <i>process- id</i> | ospf , 1-65535. |
|--------------------|-----------------|

OSPFv3

```
Ruijie# show ipv6 ospf
Routing Process "OSPFv3 (1)" with ID 1.1.1.1
Process uptime is 24 minutes
SPF schedule delay 5 secs, Hold time between SPFs 10 secs
```

```

Minimum LSA interval 5 secs, Minimum LSA arrival 1 secs
Number of incoming current DD exchange neighbors 0/5
Number of outgoing current DD exchange neighbors 0/5
Number of external LSA 0. Checksum Sum 0x0000
Number of AS-Scoped Unknown LSA 0
Number of LSA originated 11
Number of LSA received 4
Log Neighbor Adjency 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
Number of LSA 3. Checksum Sum 0x1DDF1
Number of Unknown LSA 0

```

OSPFv3 BFD , "BFD is enabled",

```

Ruijie# show ipv6 ospf
Routing Process "OSPFv3 (1)" with ID 1.1.1.1
Process uptime is 24 minutes
SPF schedule delay 5 secs, Hold time between SPFs 10 secs
Minimum LSA interval 5 secs, Minimum LSA arrival 1 secs
Number of incoming current DD exchange neighbors 0/5
Number of outgoing current DD exchange neighbors 0/5
Number of external LSA 0. Checksum Sum 0x0000
Number of AS-Scoped Unknown LSA 0
Number of LSA originated 11
Number of LSA received 4
Log Neighbor Adjency Changes : Enabled
Number of areas in this router is 2
BFD is enabled
Area BACKBONE(0)
Number of interfaces in this area is 1(1)
SPF algorithm executed 4 times
Number of LSA 3. Checksum Sum 0

```

|                                      |        |
|--------------------------------------|--------|
|                                      |        |
| <b>ipv6 router ospf</b>              | OSPFv3 |
| <b>default-information originate</b> |        |

|                       |                      |
|-----------------------|----------------------|
| <b>default-metric</b> |                      |
| <i>router-id</i>      | OSPFv3               |
| <b>timers spf</b>     | OSPFv3<br>SPF<br>SPF |

### 39.2.2 show ipv6 ospf database

OSPFv3

**show ipv6 ospf [**

```

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 |

### 39.2.3 show ipv6 ospf interface

OSPFv3

**show ipv6 ospf interface** [*interface-type interface-number*]

|                       |  |
|-----------------------|--|
|                       |  |
| <i>interface-type</i> |  |

```
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
```



```

Database Summary List 0
Link State Request List 0
Link State Retransmission List 0
      BFD
BFD session state up
Ruijie# show ipv6 ospf neighbor detail
Neighbor      2.2.2.2,      interface      address
fe80::c800:eff:fe84:1c
In the area 0.0.0.0 via interface FastEthernet 1/0
Neighbor priority is 1, State is Full, 6 state changes
DR is 2.2.2.2 BDR is 1.1.1.1
Options is 0x000013 (-|R|-|-|E|V6)
Dead timer due in 00:00:36
Database Summary List 0
Link State Request List 0
Link State Retransmission List 0
BFD session state up

```

|                                 |        |
|---------------------------------|--------|
|                                 |        |
| <b>ipv6 router ospf</b>         | OSPFv3 |
| <b>ipv6 ospf area</b>           | OSPFv3 |
| <b>area virtual-link</b>        | OSPFv3 |
| <b>show ipv6 ospf interface</b> | OSPFv3 |

### 39.2.5 show ipv6 ospf route

OSPFv3

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

|                   |                   |
|-------------------|-------------------|
|                   |                   |
| <i>process-id</i> | OSPFv3 , 1-65535. |
| <i>count</i>      | OSPFv3            |

## OSPF

```

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 2222::/64                                1/20
via fe80::c800:eff:fe84:1c, FastEthernet 1/0
O 3333::/64                                  11
via fe80::c800:eff:fe84:1c, FastEthernet 1/0, Area
0.0.0.0

```

| ipv6 router ospf | OSPFv3 |
|------------------|--------|

## 39.2.6 show ipv6 ospf topology

## OSPFv3

```
show ipv6 ospf [process- id] topology [area area-id]
```

| <i>process- id</i> | OSPFv3 , 1-65535. |
|--------------------|-------------------|
| <i>area-id</i>     |                   |

## OSPFv3

```

Ruijie# show ipv6 ospf topology
OSPFv3 Process (1)
OSPFv3 paths to Area (0.0.0.0) routers
Router ID      Bits  Metric  Next-Hop
Interface
1.1.1.1        EB   --

```

```
2.2.2.2          E 1          2.2.2.2
FastEthernet 1/0
```

```
OSPFv3 paths to Area (0.0.0.1) routers
Router ID      Bits Metric  Next-Hop
Interface
1.1.1.1       B  --
```

| <b>ipv6 router ospf</b> | OSPFv3 |
|-------------------------|--------|
| <b>area range</b>       | OSPF   |

### 39.2.7 show ipv6 ospf virtual-links

OSPFv3

**show ipv6 ospf [process- id] virtual-links**

| <i>process- id</i> | OSPFv3 , 1-65535. |
|--------------------|-------------------|

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 3333::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
```



# 40 IGMP

## 40.1 IGMP

```
' clear ip igmp group
' clear ip igmp interface
' ip igmp access-group
' ip igmp join-group
' ip igmp static-group
' ip igmp immediate-leave group-list
' ip igmp last-member-query-count
' ip igmp last-member-query-interz
'
```

**clear ip igmp group***[group-address | interface-type interface-number]*

|  |  |
|--|--|
|  |  |
|  |  |

*group-address*

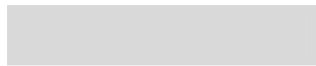


## 40.1.4 ip igmp join-group

no

**ip igmp join-group** *group-address*

**no ip igmp join-group** *group-address*



|                      |  |
|----------------------|--|
| <i>group-address</i> |  |
|----------------------|--|

Eth0      236.6.6.6

```
Ruijie# configure terminal
Ruijie(config)# interface ethernet 0
Ruijie(config-if)# ip igmp static-group 236.6.6.6
Ruijie(config-if)# exit
```

#### 40.1.6 ip igmp immediate-leave group-list

IGMPversion2    IGMPversion3

no

**ip igmp immediate-leave group-list *access-list***

**no ip igmp immediate-leave group-list**

|                    |  |
|--------------------|--|
|                    |  |
| <i>access-list</i> |  |

IGMP

2s

IGMP

IGMP

```

Ruijie# configure terminal
Ruijie(config)# access-list 1 permit 225.192.20.0
0.0.0.255
Ruijie(config)# interface ethernet 0/1
Ruijie(config-if)# ip igmp immediate-leave group-list
1
Ruijie(config-if)# exit

```

**ip igmp last-member-query-interval**

### 40.1.7 ip igmp last-member-query-count

```

last-member-query-count leave
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

13.

**ip igmp immediate-leave**

### 40.1.9 ip igmp limit ( )

igmp states

no

**ip igmp limit ~~number~~ *except***

*access-list*]

**no ip igmp limit**

|                    |                             |
|--------------------|-----------------------------|
|                    |                             |
| <i>number</i>      | IGMP<br>1-16384             |
| <b>except</b>      | <i>access-list</i><br>limit |
| <i>access-list</i> |                             |

no

**ip igmp query-interval** *seconds*

**no ip igmp query-interval**

|                |           |
|----------------|-----------|
|                |           |
| <i>seconds</i> | s 1 18000 |

125

Ethernet 0

120s

Ruijie(config-if)# **ip igmp query-interval 120**

Ethernet 0

Ruijie(config-if)# **no ip igmp query-interval**

#### 40.1.11 ip igmp query-max-response-time

no

**ip igmp query-max-response-time** *seconds*

**no ip igmp query-max-response-time**

|                |        |
|----------------|--------|
|                |        |
| <i>seconds</i> | s 1 25 |

10s

## IGMPv2

Ethernet 0

20s

```
Ruijie(config-if)# ip igmp query-max-response-time 20
```

Ethernet 0

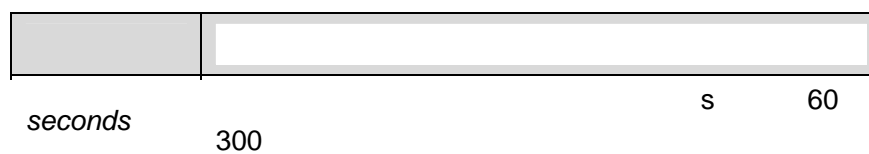
```
Ruijie(config-if)# no ip igmp query-max-response-time
```

### 40.1.12 ip igmp query-timeout

no

```
ip igmp query-timeout seconds
```

```
no ip igmp query-timeout
```



Ethernet 0

```
Ruijie(config-if)# no ip igmp query-timeout
```

### 40.1.13 ip igmp robustness-variable

no

**ip igmp robustness-variable** *number*

**no ip igmp robustness-variable**

|               |     |
|---------------|-----|
|               |     |
| <i>number</i> | 2-7 |

2

3

```
Ruijie# configure terminal
```

```
Ruijie(config)# interface ethernet 0
```

```
Ruijie(config-if)# ip igmp robustness-variable 3
```

### 40.1.14 ip igmp version

IGMP

no

**ip igmp version** {1 | 2 | 3}

**no ip igmp version**

|  |  |
|--|--|
|  |  |
|--|--|

---

|             |       |
|-------------|-------|
| {1   2   3} | <1-3> |
|-------------|-------|

2.

igmp

igmp

2

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

#### 40.1.15 ip igmp limit ( )

igmp

no

```
ip igmp limit number [except access-list]  
no ip igmp limit number [except access-list]
```

IGMP  
IGMP

300

Ruijie config # ip igmp limit 300

### 40.1.16 ip igmp proxy-service

mroute-proxy  
mroute-proxy

**ip igmp proxy-service**

**no ip igmp proxy-service**

proxy-service

proxy-service 255 32  
proxy-service  
proxy-service mroute-proxy  
proxy-service  
switchport ip igmp  
**mroute-proxy interface**

proxy-service

Ruijie(config-if)# ip igmp proxy-service

### 40.1.17 ip igmp mroute-proxy

---

```
ip igmp mroute-proxy interfname
```

```
no ip igmp mroute-proxy
```

|                   |  |
|-------------------|--|
|                   |  |
| <i>interfname</i> |  |

```
proxy-service
```

```
gmp
```

```
mroute-proxy
```

```
Ruijie(config-if)# ip igmp mroute-proxy fa 0/1
```

#### 40.1.18 ip igmp ssm-map enable

```
igmp ssm-map
```

```
ip igmp ssm-map enable
```

```
no ip igmp ssm-map enable
```

```
ip igmp ssm-map static
```

```
igmp ssm-map
```

```
Ruijie(config)# ip igmp ssm-map enable
```

### 40.1.19 ip igmp ssm-map static

ssm-map

**ip igmp ssm-map static** *access-list a.b.c.d*

**no ip igmp ssm-map static** *access-list a.b.c.d*

|                    |     |                           |  |
|--------------------|-----|---------------------------|--|
|                    |     |                           |  |
| <i>access-list</i> | Acl | <1-99>  <1300-1999>  WORD |  |
| <i>a.b.c.d</i>     |     |                           |  |

**ip igmp ssm-map enable**

v3

ACL 11 192.168.2.2,

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

### 40.1.20 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>           |  |
|                         |  |

```
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
```

```
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
```

## 40.1.21 show ip igmp interface

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

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

```
Ruijie# show ip igmp interface
Interface vlan 1(Index 4294967295)
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
```

#### 40.1.22 show ip igmp ssm-mapping

IGMP ssm-map

**show ip igmp ssm-mapping** [ *A.B.C.D* ]

|                |  |
|----------------|--|
|                |  |
| <i>A.B.C.D</i> |  |

## IGMP ssm-map

### ssm-map

```
Ruijie# sh ip igmp ssm-mapping  
SSM Mapping : Enabled  
Database    : Static mappings configured
```

### 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
```

# 41 PIM-DM

## 41.1 PIM-DM

PIM-DM

```
' ip pim dense-mode
' ip pim neighbor-filter
' ip pim query-interval
' ip pim state-refresh disable
' ip pim state-refresh origination-interval
' show ip pim dense-mode interface
' show ip pim dense-mode neighbor
' show ip pim dense-mode nexthop
' show ip pim dense-mode mroute
```

### 41.1.1 ip pim dense-mode

```
no PIM-DM ip pim dense-mode
PIM-DM
```

**ip pim dense-mode**  
**no ip pim dense-mode**

PIM-DM

```
Ruijie# configure terminal
Ruijie(config)# interface fastethernet 0/1
Ruijie(config-if)# ip pim dense-mode
```

/

```
Ruijie# configure terminal
Ruijie(config)# interface fastethernet 0/1
Ruijie(config-if)# ip pim neighbor-filter 14
```

/

**ip pim neighbor-filter**

1.               ACL                                       PIM  
           ACL                                                               PIM
2.                    peering                               PIM  
                       PIM                                               PIM  
                                                               PIM

**41.1.3 ip pim query-interval**

hello interval                                                                                       §

### 41.1.4 ip pim state-refresh disable

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

```
ip pim state-refresh disable
```

```
no ip pim state-refresh disable
```

```
SR Cap                          Hello          Hello
```

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

---

```
ip pim state-refresh disable
                                PIM-DM
```

---

### 41.1.5 ip pim state-refresh origination-interval

```
                                PIM-DM          ip pim
state-refresh origination-interval
                                no
```

---

**ip pim state-refresh origination-interval** *interval-seconds*

**no ip pim state-refresh origination-interval**

|                         |         |
|-------------------------|---------|
|                         |         |
| <i>interval-seconds</i> | <1-100> |

60

```
Ruijie# configure terminal
Ruijie(config)# interface fastethernet 0/1
Ruijie(config-if)# ip pim state-refresh
origination-interval 65
```

### 41.1.6 show ip pim dense-mode interface

PIM-DM **show ip pim dense-mode interface**

**show ip pim dense-mode interface** [ *interface-type interface-number* ] [ *detail* ]

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

/ /

**show ip pim dense-mode interface**

```
Ruijie# show ip pim dense-mode interface
Address      Interface      VIFIndex  Ver/  Nbr
              Mode          Count
10.10.10.10  FastEthernet  0/45      3     v2/D  1
```

50.50.50.50    VLAN 4                            2    v2/D    1

| Address   | PIM-DM            IP |
|-----------|----------------------|
| Interface | PIM-DM               |
| VIF Index | VIF            ID    |
| Ver/Mode  | PIM    /             |
| Nbr Count | PIM-DM               |

|                  |     |
|------------------|-----|
|                  |     |
| Neighbor-Address |     |
| Interface        |     |
| Uptime/Expires   |     |
| Ver              | PIM |

### 41.1.8 show ip pim dense-mode nexthop

PIM-DM

**show ip pim dense-mode nexthop**

**show ip pim dense-mode nexthop**

/ /

PIM-DM

Ruijie# **show ip pim dense-mode nexthop**

```

Destination  Nexthop  Nexthop  Nexthop  Metric  Pref
              Num    Addr    Interface
1.1.1.111    1        50.50.50.1  VLAN 4    0       1
    
```

|              |  |
|--------------|--|
|              |  |
| Destination  |  |
| Nexthop Num  |  |
| Nexthop Addr |  |

Nexthop Interface

p4 Tc 10.5 0 0 10.5 180.6 268.8803

PIM-DM

**show ip pim dense-mode mroute**

**show ip pim dense-mode mroute [ *A.B.C.D A.B.C.D* ] [ *summary* ]**



## 42 PIM-SM

### 42.1 PIM-SM

#### PIM-SM

- ' **clear ip mroute**
- ' **clear ip mroute statistics**
- ' **clear ip pim sparse-mode bsr rp-set**
- ' **ip multicast-routing**
- ' **ip pim accept-register list**
- ' **ip pim bsr-candidate**
- ' **ip pim cisco-register-checksum**
- ' **ip pim dr-priority**
- ' **ip pim ignore-rp-set-priority**
- ' **ip pim jp-timer**
- ' **ip pim mib**
- ' **ip pim neighbor-filter**
- ' **ip pim query-interval**
- ' **ip pim register-rate-limit**
- ' **ip pim register-rp-reachability**
- ' **ip pim register-source**
- ' **ip pim register-suppression**
- ' **ip pim rp-address**
- ' **ip pim rp-candidate**
- ' **ip pim rp-1 Tf-0.E0t**
- ' **ip pim sparse-mode**
- ' **ip pim spt-threshold**
- ' **ip pim ssm**
- ' **show debugging**
- ' **show ip pim sparse-mode bsr-router**

- ' **show ip pim sparse-mode interface**
- ' **show ip pim sparse-mode local-members**
- ' **show ip pim sparse-mode mroute**
- ' **show ip pim sparse-mode neighbor**
- ' **show ip pim sparse-mode nexthop**
- ' **show ip pim sparse-mode rp mapping**
- ' **show ip pim sparse-mode rp-hash**

### 42.1.1 clear ip mroute

**clear ip mroute** { \* | *group\_address* [*source\_address*] }

|                                               |  |
|-----------------------------------------------|--|
|                                               |  |
| *                                             |  |
| <i>group_address</i>                          |  |
| <i>group_address</i><br><i>source_address</i> |  |

```
Ruijie# clear ip mroute *
Ruijie# clear ip mroute 224.2.2.2
Ruijie# clear ip mroute 224.2.2.2 2.2.2.2
```

### 42.1.2 clear ip mroute statistics

**clear ip mroute statistics** { \* | *group\_address* [*source\_address*] }

|   |  |
|---|--|
|   |  |
| * |  |

|                                               |  |
|-----------------------------------------------|--|
| <i>group_address</i>                          |  |
| <i>group_address</i><br><i>source_address</i> |  |

```
Ruijie# clear ip mroute statistics *  
Ruijie# clear ip mroute statistics 224.2.2.2  
Ruijie# clear ip mroute statistics 224.2.2.2 2.2.2.2
```

PIM-SM  
PIM-SM

**ip pim sparse-mode**

```
Ruijie(config)# ip multicast-routing
```

## 42.1.5 ip pim accept-register list

**ip pim accept-register list** *access-list*

| <i>access-list</i> | access-list<br><2000 2699> | <100 199><br>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**

## 42.1.6 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<br>HASH<br>10 |
| <i>priority-value</i>                  | <0-255><br>BSR<br>64    |

BSR

```

PIM-SM
RP
BSR BSR
BSR BSR C-BSR BSR
PIM-SM 224.0.0.13 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
    
```

### 42.1.7 ip pim cisco-register-checksum

**ip pim cisco-register-checksum [group-list access-list]**

|  |  |
|--|--|
|  |  |
|--|--|

---

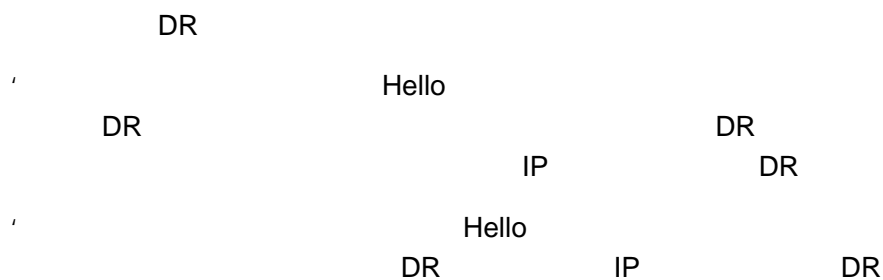
```
access-list <1 99> <1300 1999>
  acl
  group-list access-list
```

*access-list*

---

---

---



```

Ruijie# configure terminal
Ruijie(config)# interface g 0/3
Ruijie(config-if)# ip pim dr-priority 10000
  
```

### 42.1.9 ip pim ignore-rp-set-priority

**ip pim ignore-rp-set-priority**

RP-SET RP

RP RP

```

Ruijie# configure terminal
Ruijie(config)# ip pim ignore-rp-set-priority
  
```

### 42.1.10 ip pim jp-timer

**ip pim jp-timer interval-seconds**



|                         |           |
|-------------------------|-----------|
| <i>interval-seconds</i> | <1-65535> |
|-------------------------|-----------|

Join/Prune

60s

Join/Prune

```
Ruijie# configure terminal
Ruijie(config)# ip pim jp-timer 50
```

### 42.1.11 ip pim mib

**ip pim mib dense-mode**

sparse-mode MIB

dense-mode MIB

```
Ruijie# configure terminal
Ruijie(config)# ip pim mib dense-mode
```

### 42.1.12 ip pim neighbor-filter

**ip pim neighbor-filter *access\_list***

|                    |             |     |      |     |
|--------------------|-------------|-----|------|-----|
|                    |             |     |      |     |
| <i>access_list</i> | access-list | acl | 1-99 | acl |

PIM

PIM-SM

peering

```
Ruijie# configure terminal
Ruijie(config)# interface g 0/3
Ruijie(config-if)# ip pim neighbor-filter 14
Ruijie(config-if)# exit
Ruijie(config)# access-list 14 deny 192.168.1.5
0.0.0.255
```

**access-list**

```
Ruijie# configure terminal
Ruijie(config)# interface g 0/3
Ruijie(config-if)# ip pim query-interval 123
```

## 42.1.14 ip pim register-rate-limit

```
ip pim register-rate-limit rate
```

```
ip pim register-rate-limit rate
```

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

```
yT@_8
```

RP

```
Ruijie# configure terminal  
Ruijie(config)# ip pim register-rp-reachability
```

### **42.1.16 ip pim register-source**

```
ster-6(urce )]T/T0 1 Tf57 Tc 0 T0 177247 0 Td{y
```

**ip pim register-suppression** *seconds*

|                |            |
|----------------|------------|
|                |            |
| <i>seconds</i> | <11-21843> |

60

DR  
rp-register-kat

DR  
RP

ip pim  
RP keepalive

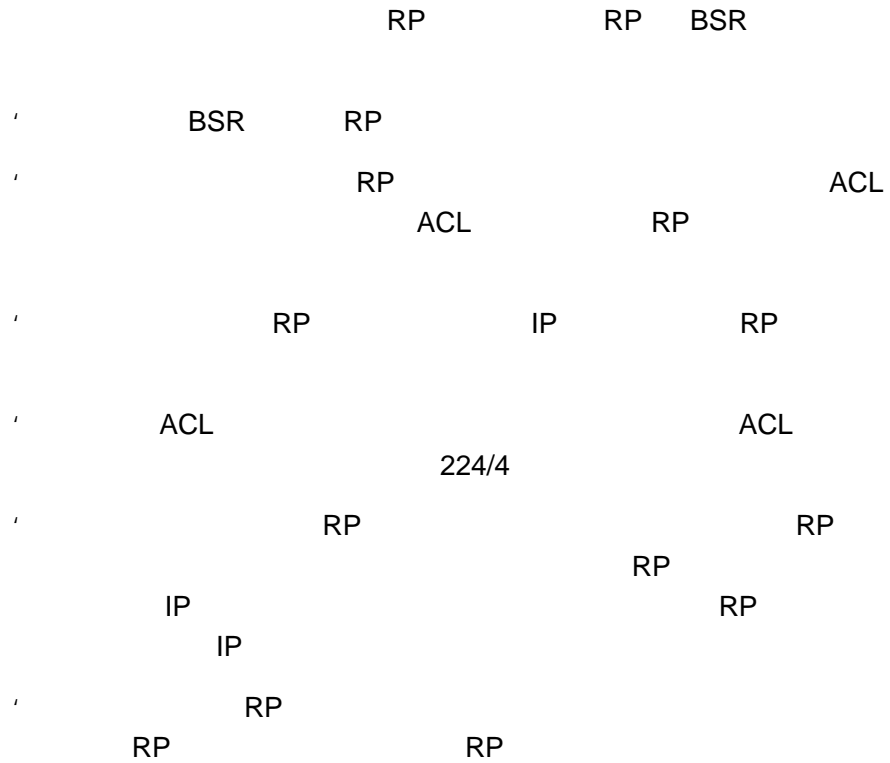
```
Ruijie# configure terminal
Ruijie(config)# ip pim register-suppression 100
```

## 42.1.18 ip pim rp-address

**ip pim rp-address** *rp-address* [*access\_list*]

|                    |             |                    |               |
|--------------------|-------------|--------------------|---------------|
|                    |             |                    |               |
| <i>rp-address</i>  | RP          | IP                 |               |
| <i>access_list</i> | <1300-1999> | access-list<br>acl | acl<br><1-99> |

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**

### 42.1.19 ip pim rp-candidate

**ip pim rp-candidate** *interface-type interface-number* [**priority** *priority-value*][**interval** *interval-seconds*][**group-list** *access\_list*]

|                         |                                                             |
|-------------------------|-------------------------------------------------------------|
| <i>interface-type</i>   |                                                             |
| <i>interface-number</i> |                                                             |
| <i>priority-value</i>   | <0-255> priority priority-value<br>192                      |
| <i>Interval-seconds</i> | <1-16383> interval<br>interval-seconds interval-seconds 60s |

|                    |                               |      |     |
|--------------------|-------------------------------|------|-----|
| <i>access_list</i> | acl                           | 1-99 | acl |
|                    | group-list <i>access_list</i> |      |     |

RP

```

PIM-SM
BSR
BSR PIM
C-RP
RPT
BSR
RP
C-RP
RP
permit ace acl
deny
ace
Ruijie#
```

RP KAT

```
Ruijie# configure terminal  
Ruijie(config)# ip pim rp-register-kat 250
```

## 42.1.21 ip pim sparse-mode

**ip pim sparse-mode**

PIM-SM

PIM-SM

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

---

/

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-SM

PIM-SM PIM-DM DVMRP

v4

---

## 42.1.22 ip pim spt-threshold

**ip pim spt-threshold** [*group-list access-list*]

|                    |                                                           |            |      |
|--------------------|-----------------------------------------------------------|------------|------|
|                    |                                                           |            |      |
| <i>access-list</i> | access-list<br>1300-1999<br>group-list access-list<br>SPT | acl<br>acl | 1-99 |

SPT

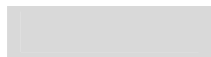
RPT      SPT  
           SPT            group-list  
 group-list                    SPT

```
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**

## 42.1.23 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

232/8

```

Ruijie# configure terminal
Ruijie(config)# ip pim ssm default
                                10
Ruijie(config)# ip pim ssm range 10
Ruijie(config)# access-list 10 permit 232.0.0.1
0.0.0.255

```

**access-list****42.1.24 show debugging****show debugging**

/ /

```

Ruijie #show debugging
PIM-SM Debugging status:
  PIM packet debugging is on

```

## 42.1.25 show ip pim sparse-mode bsr-router

**show ip pim sparse-mode bsr-router**

/ /

BSR .

```
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
```

## 42.1.26 show ip pim sparse-mode interface

**show ip pim sparse-mode interface** [*interface-type interface-number*  
[*detail*]

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

/ /

PIM SM

```
Ruijie# show ip pim sparse-mode interface detail
GigabitEthernet 0/3 (vif 2):
Address 30.30.100.200, DR 30.30.100.200
Hello period 30 seconds, Next Hello in 13 seconds
Triggered Hello period 5 seconds
Neighbors:
30.30.100.1
```

### 42.1.27 show ip pim sparse-mode local-members

**show ip pim sparse-mode local-members**  
*[interface-type interface-number]*

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

/ /

PIM SM                      IGMP

```
Ruijie# show ip pim sparse-mode local-members
PIM Local membership information
GigabitEthernet 0/3:
(*, 225.1.1.1) : Include
Loopback 1:
```

### 42.1.28 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 |

/ /

### 42.1.29 show ip pim sparse-mode neighbor

**show ip pim sparse-mode neighbor** [*detail*]

|               |  |
|---------------|--|
|               |  |
| <i>detail</i> |  |

/ /

```
Ruijie# show ip pim sparse-mode neighbor detail
Nbr 5.5.5.3 (VLAN 1)
Expires in 81 seconds
```

### 42.1.30 show ip pim sparse-mode nexthop

**show ip pim sparse-mode nexthop**

/ /

metric

### 42.1.31 show ip pim sparse-mode rp mapping

**show ip pim sparse-mode rp mapping**

/ /

RP

```
Ruijie# show 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
```

### 42.1.32 show ip pim sparse-mode rp-hash

**show ip pim sparse-mode rp-hash *group-address***

|                      |  |
|----------------------|--|
|                      |  |
| <i>group-address</i> |  |

/ /



---

# 43

## 43.1

- ' clear ip mroute
- ' clear ip mroute statistics
- ' ip mroute
- ' ip multicast route-limit
- ' ip multicast ttl-threshold
- ' ip multicast-routing
- ' ip multicast boundary
- ' show ip mroute
- ' show ip rpf
- ' show ip mvif

### 43.1.1 clear ip mroute

IP

**clear ip mroute** { \* | *group-address* [*source -address*]

| *                     |  |
|-----------------------|--|
| <i>group-address</i>  |  |
| <i>source-address</i> |  |

230.0.0.1

Ruijie# **clear ip mroute** 230.0.0.1

| <b>show ip mroute</b> |  |
|-----------------------|--|

---

## 43.1.2 clear ip mroute statistics

IP

```
clear ip mroute statistics {* | group-address [source -address]}
```

|                                                  |                  |
|--------------------------------------------------|------------------|
| <i>rpf-address</i>                               |                  |
| <i>interface-type</i><br><i>interface-number</i> |                  |
| <i>distance</i>                                  | 0 RPF<br><1-255> |

*Distance Distance 0*

RFF

ip

172.30.10.13

```
Ruijie(config)# ip mroute 172.16.0.0 255.255.0.0
172.30.10.13
```

### 43.1.4 ip multicast route-limit

**ip multicast route-limit** *limit* [*threshold*]

**no ip multicast route-limit** *limit* [*threshold*]

|                  |                      |
|------------------|----------------------|
|                  |                      |
| <i>limit</i>     | 1~2147483647<br>1024 |
| <i>threshold</i> | 2147483647.          |

*limit 1024*

*threshold 2147483647*

---

IPv6

---

500

Ruijie(config)# **ip multicast route-limit 500**

### 43.1.5 ip multicast ttl-threshold

TTL Time-To-Live

**no**

**ip multicast ttl-threshold *ttl-value***

**no ip multicast ttl-threshold**

|                  |             |
|------------------|-------------|
|                  |             |
| <i>ttl-value</i> | TTL , 0~255 |

*ttl-value* 1

TTL TTL  
TTL TTL 0 TTL

---

TTL 5

Ruijie(config-if)# ip multicast ttl-threshold 5

### 43.1.6 ip multicast-routing

no

ip multicast-routing

no ip multicast-routing

IPv4

IPv4

SNOOPING SVGL S8606 S8610 S8614 IGMP  
IVGL-SVGL IVGL-SVGL IGMP SNOOPING SVGL  
IVGL-SVGL ip



---

**show ip mroute** [ *group-address*] [*source-address*] [**dense**][ **sparse**]  
**[summary]** [**count**]

|                       |       |
|-----------------------|-------|
|                       |       |
| <i>group-address</i>  |       |
| <i>source-address</i> |       |
| <b>dense</b>          | PIMDM |
| <b>sparse</b>         | PIMSM |
| <b>summary</b>        |       |
| <b>count</b>          |       |

```
Ruijie# show ip mroute
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 00:00:31, stat expires
00:02:59
Owner PIM-SM, Flags: TF
Incoming interface: FastEthernet 2/1
Outgoing interface list:
FastEthernet 1/3
```

```
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

Ruijie# **show ip mroute count**

IP Multicast Statistics

Total 1 routes using 132 bytes memory

Route limit/Route threshold: 2147483647/2147483647

Total NOCACHE/WROGVIF/WHOLEPKT rcv from fwd: 1/0/0

Total NOCACHE/WROGVIF/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: WROGVIF/WHOLEPKT rcv

Client msg counts: WROGVIF/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

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-<br>T-<br>F- |
|---------------------------|----------------|
| Timers:Uptime/Stat Expiry |                |
| Interface State           |                |
| Owner                     |                |
| Incoming interface        |                |
| Outgoing interface list   |                |

|                                            |   |
|--------------------------------------------|---|
| Forwarding Counts Pkt<br>count/Byte count, | / |
| Other Counts: Wrong If pkts                |   |

|                             |        |
|-----------------------------|--------|
|                             |        |
| <b>ip multicast-routing</b> |        |
| <b>ip pim dense-mode</b>    | PIM-DM |
| <b>ip pim sparse-mode</b>   | PIM-SM |

### 43.1.9 show ip rpf

#### RPF

**show ip rpf** {*source-address*}

|                       |  |
|-----------------------|--|
|                       |  |
| <i>source-address</i> |  |

#### 192.168.1.54 RPF

```
Ruijie# show ip rpf 192.168.1.54
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 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

### 43.1.10 show ip mvif

**show ip mvif** { *interface-type interface-number* }

| ' ]bhYfZUMV! hndY  |  |
|--------------------|--|
| ]bhYfZUMV! bi aVYf |  |

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
```

## 43.2 IP

IP

---

```
Ruijie# debug nsm mcast all
```

### **43.2.2 debug nsm mcast fib-msg**

**no**

```
debug nsm mcast fib-msg
```

```
Ruijie# debug nsm mcast fib-msg
```

### **43.2.3 debug nsm mcast vif**

---

Ruijie# **debug nsm mcast vif**

#### **43.2.4 debug nsm mcast register**

**no**

**debug nsm mcast register**

Ruijie# **debug nsm mcast register**

#### **43.2.5 debug nsm mcast stats**

**no**

**debug nsm mcast stats**

---

```
Ruijie# debug nsm mcast stats
```



```
Ruijie(config-mpls-router)#advertise-labels for
bgp-routes
```

## 44.2 discovery targeted-hello

```
hello no
```

```
discovery targeted-hello {holdtime | interval} seconds
no discovery targeted-hello {holdtime | interval}
```

| <b>holdtime</b> | hello                  |
|-----------------|------------------------|
| <b>interval</b> | hello                  |
| <b>seconds</b>  | 1-65535 holdtime 65535 |

```
hello 45 hello 5
1/9
```

### config-mpls-router

```
target hello holdtime interval
```

```
LDP
targeted hello
```

```
Ruijie(config)# mpls router ldp
Ruijie(config-mpls-router)# discovery target-hello
holdtime 90
```

| <b>show mpls ldp parameters</b> | LDP |
|---------------------------------|-----|

## 44.3 label-merge

no

**[no] label-merge****config-mpls-router**

DU

LDP

Ruijie(config)# **mpls router ldp**Ruijie(config-mpls-router)# **label-merge**

|                                   |     |
|-----------------------------------|-----|
|                                   |     |
| <b>Show mpls ldp parameters</b>   | LDP |
| <b>mpls ldp distribution-mode</b> |     |

## 44.4 label-retention-mode

no

**label-retention-mode {liberal | conservative}****[no] label-retention-mode**

|  |  |
|--|--|
|  |  |
|--|--|

**liberal**

## LDP

```
Ruijie(config)# mpls router ldp
Ruijie(config-mpls-router)#label-retention-mode liberal
```

|                                 |     |
|---------------------------------|-----|
|                                 |     |
| <b>show mpls ldp parameters</b> | LDP |

## 44.5 label-switching

MPLS  
MPLS

MPLS

**[no] label-switching**

MPLS  
MPLS

MPLS

MPLS

M8600-MPLS

MPLS

```
Ruijie(config)# interface Gi4/1
Ruijie(config-if)# label-switching
```

|                             |  |
|-----------------------------|--|
|                             |  |
| <b>show mpls label-pool</b> |  |

## 44.6 ldp router-id

```

LDP LSR ID          no
[no] ldp router-id A.B.C.D

```

|         |  |
|---------|--|
|         |  |
| A.B.C.D |  |

```

Router ID    LDP    LSR ID

config-mpls-router

```

```

ldp router-id          LDP          ldp router-id
transport-address      ldp router-id  LSR

```

```

Ruijie(config-mpls-router)# ldp router-id 10.10.10.30

```

|                         |     |
|-------------------------|-----|
|                         |     |
| show mpls ldp parameter | LDP |

## 44.7 loop-detection

```

no
[no]loop-detection

```

```

config-mpls-router

```

```

LDP

```

```

Ruijie(config)# mpls router ldp

```

```
Ruijie(config-mpls-router)# loop-detection
```

| <b>show mpls ldp parameters</b> | LDP |
|---------------------------------|-----|
| <b>mpls ldp max-path-vector</b> | LDP |
| <b>mpls ldp max-hop-count</b>   |     |

## 44.8 lsp-control-mode

LDP no

```
lsp-control-mode {independent | ordered}
```

```
no lsp-control-mode
```

| <b>independent</b> |  |
|--------------------|--|
| <b>ordered</b>     |  |

```
config-mpls-router
```

LDP

LDP

```
Ruijie(config)# mpls router ldp
```

```
Ruijie(config-mpls-router)# lsp-control-mode ordered
```

| <b>show mpls ldp parameters</b> | LDP |
|---------------------------------|-----|

## 44.9 mpls ip

MPLS

no

```

MPLS
MPLS
MPLS
LDP
LDP
LSP
LDP
MPLS

```

```

Ruijie(config)# interface Gi4/1
Ruijie(config-if)# mpls ip

```

|                                |       |
|--------------------------------|-------|
|                                |       |
| <b>mpls ldp hello-interval</b> | hello |
| <b>mpls ldp hello-holdtime</b> | hello |

## 44.11 mpls ip fragment

```

IP
MPLS
MPLS MTU
[no] mpls ip fragment

```

```

IP
MPLS
MPLS MTU
MPLS
no mpls ip fragment
IP
MPLS
MPLS MTU
MTU

```

```

Ruijie(config)# no mpls ip fragment

```

|                |      |
|----------------|------|
|                |      |
| <b>mpls ip</b> | MPLS |

## 44.12 mpls ip icmp forward

PE

ICMP  
J 4 Z€Ě• ži¼> XP 0.0057 Tc 0 Tw 2.7833>-6<18791B5B>-68

**no mpls ip ttl expiration**

MPLS TTL

Ruijie(config)# **no mpls ip ttl expiration**

|                |      |
|----------------|------|
|                |      |
| <b>mpls ip</b> | MPLS |

### 44.14 mpls ip ttl propagate

MPLS IP TTL

**mpls ip ttl propagate {public | vpn}**

**no mpls ip ttl propagate**

|               |     |
|---------------|-----|
|               |     |
| <b>public</b> | TTL |
| <b>vpn</b>    | TTL |

TTL

```

MPLS TTL TTL TTL
' TTL TTL IP MPLS Push
Pop TTL IP MPLS TTL
TTL
' TTL Push
TTL 255 Pop IP MPLS
TTL
    
```

## TTL

```
Ruijie(config)# no mpls ip ttl propagate public
```

|         |      |
|---------|------|
|         |      |
| mpls ip | MPLS |

## 44.15 mpls ldp distribution-mode

LDP

no

```
mpls ldp distribution-mode {dod | du}
```

```
no mpls ldp distribution-mode
```

|     |  |
|-----|--|
|     |  |
| dod |  |
| du  |  |

LDP

hello

no

**mpls ldp hello-holdtime <1-65535>****no mpls ldp hello-holdtime**

| <1-65535> | hello 65535 |
|-----------|-------------|

15

LDP Link Hello  
Hello

|           |       |
|-----------|-------|
| <1-65535> | Hello |
|-----------|-------|

5

```

                    hello-holdtime          LDP
                    LDP Link Hello
Hello Holdtime          discovery targeted-hello
    
```

```

LDP          hello          10
    
```

```

Ruijie(config) # interface vlan 10
Ruijie(config-if)# mpls ldp hello-interval 10
    
```

| <b>mpls ldp hello-holdtime</b>  | hello |
|---------------------------------|-------|
| <b>discovery targeted-hello</b> | hello |

LDP

LDP

LDP

LDP      Keepalive Holdtime      **targeted-session holdtime**

LDP      Keepalive      90

```
Ruijie(config) # interface vlan 10
Ruijie(config-if)# mpls ldp keepalive-holdtime 90
```

|                                  |           |
|----------------------------------|-----------|
|                                  |           |
| <b>targeted-session holdtime</b> | keepalive |

## 44.19 mpls ldp max-hop-count

LDP      no

```
mpls ldp max-hop-count <1-255>
no mpls ldp max-hop-count
```

|         |  |
|---------|--|
|         |  |
| <1-255> |  |

254

LDP

Hop Count

LDP      hop count      30

```
Ruijie(config) # interface vlan 10
Ruijie(config-if)# mpls ldp max-hop-count 30
```

|                |     |
|----------------|-----|
|                |     |
| loop-detection | LDP |

## 44.20 mpls ldp max-label-requests

LDP no

```
mpls ldp max-label-requests <0-255>
no mpls ldp max-label-requests
```

|         |  |
|---------|--|
|         |  |
| <0-255> |  |

LDP  
LDP 0

LDP 5

```
Ruijie(config) # interface vlan 10
Ruijie(config-if)# mpls ldp max-label-requests 5
```

|                            |  |
|----------------------------|--|
|                            |  |
| mpls ldp distribution-mode |  |

## 44.21 mpls ldp max-path-vector

LDP

no

**mpls ldp max-path-vector <0-254>**

**no mpls ldp max-path-vector**

|         |  |
|---------|--|
|         |  |
| <0-254> |  |

254

LDP

LDP  
LSR ID

LDP

LDP

LDP

10

Ruijie(config)# **interface vlan 10**

Ruijie(config-if)# **mpls ldp max-path-vector 10**

|                |     |
|----------------|-----|
|                |     |
| loop-detection | LDP |

## 44.22 mpls ldp max-pdu

LDP

PDU

no

**mpls ldp max-pdu <256-4096>**

**[no] mpls ldp max-pdu**

|  |  |
|--|--|
|  |  |
|--|--|

|            |     |     |
|------------|-----|-----|
| <256-4096> | LDP | PDU |
|------------|-----|-----|

4096

LDP

LDP

LDP

256

Ruijie(config)# **interface vlan 10**Ruijie(config-if)# **mpls ldp max-pdu 256**

## 44.23 transport-address

no

**[no] transport-address [interface|ipaddr|interface\_name]**

| <b>interface</b>      | IP |
|-----------------------|----|
| <i>ipaddr</i>         | IP |
| <i>interface_name</i> | IP |

LDP LSR ID transport-address

### config-mpls-router

Ruijie(config-mpls-router)#**transport-address****192.168.0.1**

|                                 |     |
|---------------------------------|-----|
|                                 |     |
| <b>show mpls ldp parameters</b> | LDP |

## 44.24 mpls mtu

mpls mtu

**mpls mtu <64-6535>**

**no mpls mtu**

|           |  |
|-----------|--|
|           |  |
| <64-6535> |  |

mpls mtu MTU

MTU MPLS MTU MPLS  
 MTU 8 MPLS MTU MPLS  
 MPLS MTU MPLS  
 IP MPLS MTU

MTU MTU mtu MTU

Ruijie(config)# **interface Gi4/1**  
 Ruijie(config-if)# **mpls mtu 1510**

|                |      |
|----------------|------|
|                |      |
| <b>mpls ip</b> | MPLS |

## 44.25 mpls router ldp

LDP

no

LDP

**[no] mpls router ldp**

LDP

LDP

LDP

Ruijie(config)# **mpls router ldp**

Ruijie(config-mpls-router)

## 44.26 mpls static ftn

FTN                      FTN                      no                      F  
 TN                      FTN                      .

**mpls static ftn** *A.B.C.D/Mask* **out-label** *label* **nexthop** *interface-name nexthop-ip*

**no mpls static ftn** *A.B.C.D/Mask*

|                                                              |           |
|--------------------------------------------------------------|-----------|
|                                                              |           |
| <i>A.B.C.D/Mask</i>                                          | FEC       |
| <b>out-label</b> <i>label</i>                                | FEC       |
| <b>nexthop</b><br><i>interface-name</i><br><i>nexthop-ip</i> | FEC<br>IP |

```
Ruijie(config)# mpls static ftn 192.168.0.0/16
out-label 100 nexthop gi4/1 10.10.10.1
```

|                            |     |
|----------------------------|-----|
|                            |     |
| show mpls forwarding-table | FTN |

### 44.27 mpls static l3vpn-ftn

L3 VPN FTN no FTN

```
mpls static l3vpn-ftn vrf-name A.B.C.D/Mask out-label label remote-pe ip-addr
```

```
mpls static l3vpn-ftn vrf-name A.B.C.D/Mask local-forward nexthop interface-name nexthop-ip
```

```
no mpls static l3vpn-ftn vrf A.B.C.D/Mask
```

|                                                 |             |
|-------------------------------------------------|-------------|
|                                                 |             |
| vrf-name                                        | FTN VRF FTN |
| A.B.C.D/Mask                                    | Fec         |
| out-label label                                 | FTN LSP PE  |
| remote-pe ip-addr                               | PE          |
| local-forward nexthop interface-name nexthop-ip | FTN PE IP   |

```
IP vrf FTN FTN MPLS
IP VRF VRF FTN
0 FTN IP IP
```

```
Ruijie(config)# mpls static l3vpn-ftn 192.168.0.0/16
out-label 100 remote-pe 10.10.10.1
```

|                                   |     |
|-----------------------------------|-----|
|                                   |     |
| <b>show mpls forwarding-table</b> | FTN |

## 44.28 mpls static l2vc-ftn

```

VC FTN          no          FT
N
mpls static l2vc-ftn vc_id vc_peer_ip out_label label
no mpls static l2vc-ftn vc_id vc_peer_ip

```

|                               |          |
|-------------------------------|----------|
|                               |          |
| <i>vc_id</i>                  | vc id    |
| <i>vc_peer_ip</i>             | Vc PE IP |
| <b>out_label</b> <i>label</i> | VC FTN   |

```

vc          ftn          VC          AC
ftn          vc peer ip
PE LSP

```

```
Ruijie(config)# mpls static l2vc-ftn 1 10.10.10.1
out_label 21
```

|                                   |        |
|-----------------------------------|--------|
|                                   |        |
| <b>show mpls l2vc ftn_table</b>   | vc ftn |
| <b>show mpls forwarding-table</b> | MPLS   |

## 44.29 mpls static ilm in-label

ILM                    ILM                    ILM                    no  
 ILM

**mpls static ilm in-label** *in\_label* **forward-action swap-label** *label*  
**nexthop** *interface-name* *nexthop-ip* **fec** A.B.C.D/M

**mpls static ilm in-label** *in\_label* **forward-action pop-l3vpn-nexthop**  
**op** *vrf-name* **nexthop** *interface-name* *nexthop-ip* **fec** A.B.C.D/Mas  
*k*

**mpls static ilm in-label** *in\_label* **forward-action pop-l2vc-destport**  
**t** *interface-name* **fec** *vc\_id*

**no mpls static ilm in-label** *in\_label*

|                                                              |                              |                      |            |
|--------------------------------------------------------------|------------------------------|----------------------|------------|
|                                                              |                              |                      |            |
| <i>in_label</i>                                              | ILM                          |                      |            |
| <b>forward-action</b>                                        | ILM<br><b>swap-label</b>     | ILM<br>L3 VPN<br>VRF | ILM<br>ILM |
| <i>label</i>                                                 | swap-label                   |                      |            |
| <i>vrf-name</i>                                              | pop-l3vpn-nexthop<br>VPN VRF |                      | ILM        |
| <i>interface-name</i>                                        | pop-l2vc-destport            |                      |            |
| <b>nexthop</b><br><i>interface-name</i><br><i>nexthop-ip</i> |                              |                      | IP         |
| <b>fec</b>                                                   | ILM                          | FEC                  |            |
| <i>A.B.C.D/Mask</i>                                          |                              | l3 vpn               | fec        |
| <i>vc_id</i>                                                 | l2vpn                        | fec                  | VC         |

ILM                    ILM                    MPLS  
 IP                    ILM                    IP

IP

```
Ruijie(config)# mpls static ilm in-label 20
forward-action swap-label 30 nexthop gi4/2 10.10.10.1
fec 172.16.0.0/26
```

|                                   |      |
|-----------------------------------|------|
|                                   |      |
| <b>show mpls forwarding-table</b> | MPLS |

## 44.30 neighbor

```
ldp no ldp
[no] neighbor A.B.C.D
```

|                |               |
|----------------|---------------|
|                |               |
| <i>A.B.C.D</i> | LSR Router ID |

LDP

**config-mpls-router**

LDP

LSR

LDP

```
10.10.10.1 LSR
```

```
Ruijie(config)# mpls router ldp
Ruijie(config-mpls-router)# neighbor 10.10.10.1
```

|                                |     |
|--------------------------------|-----|
|                                |     |
| <b>show mpls ldp discovery</b> | LDP |

|                        |     |
|------------------------|-----|
| show mpls ldp neighbor | LDP |
|------------------------|-----|

## 44.31 propagate-release

no

**ftn**

**ilm**

**vc**      vc            MPLS

**ip**      ip                mpls

**detail**      mpls                ;

**vrf**            VRF            MPLS            ;

**summary**      MPLS                ;

MPLS            ,      122F0E>Tj/T31558>Tj/TT0 1 Tf4 0 Td(,n0r8CR2 T01D0>JTJ/TT

---

**Prefix or Tunnel Id:** IP ;

**Outgoing interface:**

**Next Hop:** 0

Ruijie# **sh mpls forwarding-table summary**

MPLS forwarding is ON

Enable count:1

ILM entrys:14

ILM changes:14

ILM failed changes :0

IP FTN entrys:0

IP FTN changes:4

IP FTN faild changes:0

L2 FTN entrys:0

L2 FTN changes:0

L2 FTN faild changes:0

In label packets:0

Out label packets:0

Send label packets:0

In ip packets:0

Out ip packets:0

Out ip statck packets:0

Forwarding packets:0

Fragment packets:0

Fragment error packets:0

Label error packets:0

Label failed packets:0

Ttl over packets:0

Buffer failed packets:0

Ip don't fragment packets:0

Other failed packets:0

## 44.33 show mpls label-pool

**show mpls label-pool** [*label\_space*]

*label\_space*

*label\_space*

```
Ruijie# show mpls label-pool
label space: 0
label pool bucket size 512
min label 16, max label 1048575
label block used 2, free 2046
CLI:   0,   1   (Include label [16,1023], reserved)
LDP:   3,   4
```

|  | Label | Role |
|--|-------|------|
|--|-------|------|

```

192.168.4.0/24 remote binding: no outlabel lsr:
192.168.0.3:0
192.168.0.100/32 local binding: label: gen impl-null
192.168.4.0/24 local binding: label: gen impl-null

```

|                               |     |
|-------------------------------|-----|
|                               |     |
| <b>show mpls ldp neighbor</b> | LDP |

## 44.35 show mpls ldp discovery

LDP

**show mpls ldp discovery**

```

hello                                LDP      LDP      LDP
hello                                LDP      LDP      LDP

```

LDP

Ruijie# **show mpls ldp discovery**

Local LDP Identifier:

8.8.8.8:0

Discovery Sources:

Interfaces:

GigabitEthernet 2/1 (ldp): xmit/recv

LDP Ident: 10.30.10.10:0

GigabitEthernet 2/2 (ldp): xmit

Targeted Hellos:

8.8.8.8 -> 10.5.0.1 (ldp): active, xmit

8.8.8.8 -> 10.30.10.10 (ldp): active/passive,

xmit

2.2.2.2 -> 10.30.10.10 (ldp): passive, xmit/recv

LDP Ident: 10.30.10.10:0

|                      |                                             |
|----------------------|---------------------------------------------|
|                      |                                             |
| Local LDP Identifier | LDP                                         |
| Interfaces           | LDP                                         |
| xmit                 | LDP Hello                                   |
| rcv                  | LDP Hello                                   |
| Targeted Hellos      | targeted Hello                              |
| active               | LSR targeted Hello                          |
| passive              | LSR targeted Hello<br>LSR Targeted<br>Hello |

|                                |     |
|--------------------------------|-----|
|                                |     |
| <b>show mpls ldp interface</b> | LDP |

## 44.36 show mpls ldp neighbor

LDP

. W ñ Œ ! " Q - D Ž õ - á ' C I

Addresses bound to peer LDP Ident:

10.20.10.10 192.168.201.220 192.168.198.1  
10.5.0.1



Targeted Session Keepalive HoldTime/Interval:  
180/60 sec  
Targeted Hello HoldTime/Interval: 90/10 sec

■

■

```

Session attach socket FD[2572], read thread is 0xc6019c0,
write thread is (nil)
LDP Peer Address:
192.168.4.1
192.168.0.2
192.168.3.2

```

## 44.39 show mpls summary

MPLS

**show mpls summary**

MPLS

MPLS

```

Ruijie# show mpls summary
Per label-space information: //
0
Label-space 0 is using minimum label: 16 and maximum
label: 1048575 //
Label-switching Interface: //
Interface Label space
GigabitEthernet 4/1 0
GigabitEthernet 4/2 0
Total number of mpls interface is 2

```

|                        |  |
|------------------------|--|
|                        |  |
| <b>label-switching</b> |  |

## 44.40 targeted-session holdtime

keepalive no

**targeted-session holdtime <15-65535>**

|          |  |
|----------|--|
|          |  |
| 15-65535 |  |

```

LDP                               LDP                               180
keepalive                          60    LDP                          1/3

```

**config-mpls-router**

```

LDP                               LDP                               LDP
LDP                               LDP                               90

```

```

Ruijie(config)# mpls router ldp
Router(config-mpls-router)# targeted-session holdtime
90

```

|                                 |     |
|---------------------------------|-----|
|                                 |     |
| <b>show mpls ldp parameters</b> | LDP |

---

|  |  |
|--|--|
|  |  |
|  |  |
|  |  |

---

vpn

Router

family VPN PE VPN address-  
 s-family VPN exit-address-family address

```
Ruijie(config)# router bgp 100
Ruijie(config-router)# address-family vpnv4
```

|                     |  |
|---------------------|--|
|                     |  |
| neighbor activate   |  |
| exit-address-family |  |

### 45.3 clear ip bgp vrf

vrf

**clear ip bgp vrf** *vrf-name* [\* | address] [[soft] [in | out]]

|                     |                         |
|---------------------|-------------------------|
|                     |                         |
| <i>vrf-name</i>     | vrf                     |
| *                   | vrf BGP                 |
| <i>address</i>      | vrf peer BGP            |
| <b>ipv4 unicast</b> | ipv4                    |
| <b>in</b>           | <b>soft</b>             |
| <b>out</b>          | <b>soft</b> BGP speaker |
| <b>soft</b>         |                         |
| <b>soft in</b>      |                         |
| <b>soft out</b>     |                         |

vrf BGP

```
Ruijie# clear ip bgp vrf my-vrf in
```

## 45.4 exit address-family

**exit address-family**

VRF vpn

```
Ruijie(config)# router bgp 100
Ruijie(config-router)# address-family vpnv4 unicast
Ruijie(config-router-af)# exit address-family
```

## 45.5 ip route static inter-vrf

**[no] ip route static inter-vrf**

VRF

VRF

**no ip route static inter-vrf** vrf  
vrf

\*Aug 7 10:58:34: %NSM-6-ROUTESACROSSVRF: **Un-installing route [x.x.x.x/8] from global routing table with outgoing interface x/x.**

Ruijie(config)# **no ip route static inter-vrf**

## 45.6 ip route vrf

[no] **ip route vrf** *vrf\_name ip\_addr mask interface next-hop-address* [global]

VRF no

|                  |     |
|------------------|-----|
|                  |     |
| <i>vrf_name</i>  | VRF |
| <i>ip_addr</i>   |     |
| <i>mask</i>      |     |
| <i>interface</i> |     |
| <i>next_hop</i>  |     |
| <b>global</b>    | VRF |

vrf VRF

global VRF

global vrf

vrf

---

global VRF no ip route static inter-vrf

---

```
Ruijie(config)# ip route vrf vrf1 10.10.10.0 255.255.255.0 gi3/1 192.168.18.1
```

## 45.7 ip vrf

```
[no] ip vrf vrf_name
```

VRF

```
vrf_name VRF
```

VRF

```
Ruijie(config)# ip vrf vrf1
```

| <b>ip vrf forwarding</b> | VRF    |
|--------------------------|--------|
| <b>show ip vrf</b>       | VRF    |
| <b>rd</b>                | VRF rd |
| <b>route-target</b>      | VRF rt |

## 45.8 ip vrf forwarding

```
[no] ip vrf forwarding vrf_name
```

VRF

no

5 V, R F r T



no

**neighbor** {*peer-address* | *peer-group-name*} **activate****no neighbor** {*peer-address* | *peer-group-name*} **activate**

| <i>peer-address</i>    | IPv6<br>IPv4 |
|------------------------|--------------|
| <i>peer-group-name</i> | 32           |

ipv4

BGP

BGP IPv4

BGP IPv6

BGP IPv4 VRF

BGP VPNv4

ipv4

```
Ruijie(config)# router bgp 60
Ruijie(config-router)# neighbor 10.0.0.1 remote-as 100
Ruijie(config-router)# address-family vpnv4
Ruijie(config-router-af)# neighbor 10.0.0.1 activate
```

| <b>router bgp</b>         | BGP |
|---------------------------|-----|
| <b>neighbor remote-as</b> | BGP |

## 45.11 neighbor allowas-in

PE PE PE AS  
no AS

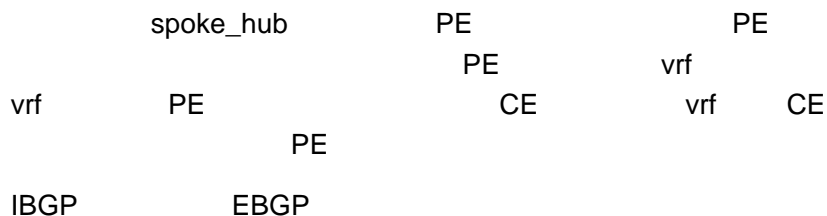
**neighbor** {*peer-address* | *peer-group-name*} **allows-in** *number*  
**no neighbor** {[*peer-address* | *peer-group-name*] **allows-in**

|                        |                   |
|------------------------|-------------------|
|                        |                   |
| <i>peer-address</i>    |                   |
| <i>peer-group-name</i> | 32                |
| <i>number</i>          | AS<br>3<br>[1 10] |

allows-in

BGP VPN

BGP IPv4 VRF



```
Ruijie(config)# router bgp 60
Ruijie(config-router)# neighbor 10.0.0.1 remote-as 100
Ruijie(config-router)# address-family ipv4 vrf vpn1
Ruijie(config-router-af)# neighbor 10.0.0.1 allows-in
```

|                   |     |
|-------------------|-----|
|                   |     |
| <b>router bgp</b> | BGP |

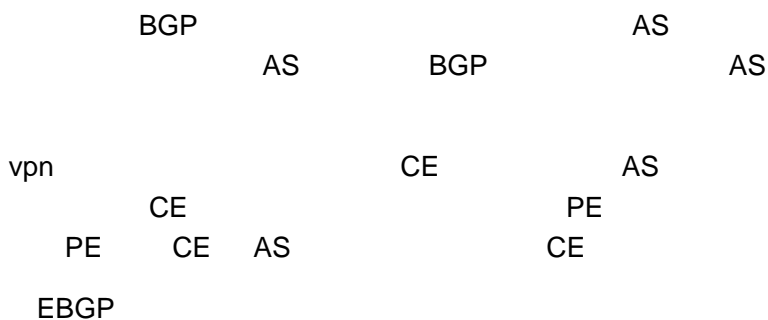
PE AS no

**neighbor** {*peer-address* | *peer-group-name*} **as-override**  
**no neighbor** {*peer-address* | *peer-group-name*} **as-override**

|                        |    |
|------------------------|----|
|                        |    |
| <i>peer-address</i>    |    |
| <i>peer-group-name</i> | 32 |

as-override

BGP IPv4 VRF



```
Ruijie(config)# router bgp 60
Ruijie(config-router)# neighbor 10.0.0.1 remote-as 100
Ruijie(config-router)# address-family ipv4 vrf vpn1
Ruijie(config-router-af)# neighbor 10.0.0.1
as-override
```

|                           |     |
|---------------------------|-----|
|                           |     |
| <b>router bgp</b>         | BGP |
| <b>neighbor remote-as</b> | BGP |

### 45.13 neighbor description

( ) no

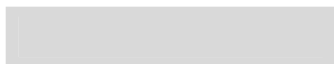
**neighbor** {*peer-address* | *peer-group-name*} **description** *text*  
**no neighbor** {*peer-address* | *peer-group-name*} **description**

|                        |           |
|------------------------|-----------|
|                        |           |
| <i>peer-address</i>    |           |
| <i>peer-group-name</i> | 32        |
| <i>text</i>            | ( )<br>80 |

BGP

BGP IPV4 vrf

```
Ruijie(config)# router bgp 60
Ruijie(config-router)# neighbor 10.1.1.1 remote-as 80
Ruijie (config-router)# neighbor 10.1.1.1 description
xyz.com
```



**neighbor** {*peer-address* | *peer-group-name*} **remote-as** *as-number*  
**no neighbor** {*peer-address* | *peer-group-name*} **remote-as** *as-number*

|                        |                      |
|------------------------|----------------------|
|                        |                      |
| <i>peer-address</i>    | IPv6<br>IPv4         |
| <i>peer-group-name</i> | 32                   |
| <i>as-number</i>       | BGP ( )<br><1-65535> |

BGP

BGP

BGP IPv4

BGP IPv6

BGP IPv4 VRF

-

G

|                        |              |
|------------------------|--------------|
|                        |              |
| <i>peer-address</i>    | IPv6<br>IPv4 |
| <i>peer-group-name</i> | 32           |

BGP

BGP IPv4

BGP IPv6

BGP IPv4 VRF

( )

( )

BGP

```
Ruijie(config)# router bgp 60
Ruijie(config-router)# neighbor 10.0.0.1 shutdown
```

|                            |     |
|----------------------------|-----|
|                            |     |
| <b>router bgp</b>          | BGP |
| <b>neighbor remote-as</b>  | BGP |
| <b>show ip bgp summary</b> | BGP |

## 45.16 neighbor soo

no

**neighbor** [*peer-address* | *peer-group-name*] **soo** *soo-value*

**no neighbor** [*peer-address* | *peer-group-name*] **soo**

|                        |                                                                                                                                                                    |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                        |                                                                                                                                                                    |
| <i>peer-address</i>    |                                                                                                                                                                    |
| <i>peer-group-name</i> | 32                                                                                                                                                                 |
| <i>soo-value</i>       | <pre>soo soo_value   1 soo_value  as_num  nn an_num                               nn    2 soo_value  ip_addr nn ip_addr                               IP  nn</pre> |

soo

BGP IPv4VRF

```

CE                               CE   PE
CE
```

```

Ruijie(config)# router bgp 65000
Ruijie(config-router)# address-family ipv4 vrf vpn1
Ruijie(config-router-af)# neighbor 10.0.0.1 remote-as 100
Ruijie(config-router-af)# neighbor 10.0.0.1 soo 100:100
```

|                   |     |
|-------------------|-----|
|                   |     |
| <b>router bgp</b> | BGP |

## 45.17 rd

VRF rd

**rd** *rd\_value*

*rd\_value* RD

RD RD 0:0.

VRF

RD VRF RD RD  
 RD vrf RD RD  
 VRF RD RD

```
Ruijie(config)# ip vrf vrf1
Ruijie(config-vrf)# rd 100:1
```

|                    |     |
|--------------------|-----|
|                    |     |
| <b>ip vrf</b>      | VRF |
| <b>show ip vrf</b> | VRF |

## 45.18 redistribute

BGP

no

**redistribute** *protocol-type* [**route-map** *map-tag*] [**metric** *metric-value*]  
**no redistribute** *protocol-type* [**route-map** *map-tag*] [**metric** *metric-value*]

|                                 |                               |
|---------------------------------|-------------------------------|
|                                 |                               |
| <i>protocol-type</i>            | connected static rip          |
| <b>route-map</b> <i>map-tag</i> | <b>route-map</b><br>route-map |

|                                   |        |
|-----------------------------------|--------|
| <b>metric</b> <i>metric-value</i> | metric |
|-----------------------------------|--------|

BGP  
 BGP IPv4  
 BGP IPv6  
 BGP IPv4 VRF

IP

no  
 no

metric

no redistribute

route-map metric route-map route-map

route-map metric route-map

```
Ruijie(config-router)# redistribute static route-map
static-rmap
Ruijie(config-router)# no redistribute static
route-map static-rmap
Ruijie(config-router)# no redistribute static
```

|                          |  |
|--------------------------|--|
|                          |  |
| <b>show ip protocols</b> |  |

## 45.19 redistribute ospf

no OSPF BGP

**redistribute ospf** *process-id* [**route-map** *map-tag*] [**metric** *metric-value*]  
**[match internal external [1|2] nssa-external [1|2]]**  
**no redistribute ospf** *process-id* [**route-map** *map-tag*] [**metric**  
*metric-value*] [**match {internal|external [1|2]|nssa-external [1|2]}**]

|                                   |                                      |
|-----------------------------------|--------------------------------------|
|                                   |                                      |
| <i>process-id</i>                 | OSPF                                 |
| <b>route-map</b> <i>map-tag</i>   | <b>route-map</b><br><b>route-map</b> |
| <b>metric</b> <i>metric-value</i> | metric                               |
| <b>match</b>                      | OSPF                                 |
| <b>internal</b>                   | OSPF internal<br>ospf match          |
| <b>external [1 2]</b>             | OSPF external<br>1 2<br>1 2          |
| <b>nssa-external [1 2]</b>        | OSPF nssa-external<br>1 2<br>1 2     |

OSPF

BGP

BGP IPv4

BGP IPv6

BGP IPv4 VRF

/

```

no
redistribute no

```

```

OSPF
route-map match OSPF
metric route-map metric
route-map route-map route-map
metric route-map metric

```

```

Ruijie(config-router)# redistribute ospf 2 route-map
static-rmap
Ruijie(config-router)# no redistribute ospf 4 match
external route-map ospf-rmap
Ruijie(config-router)# no redistribute ospf 78

```

|                   |  |
|-------------------|--|
|                   |  |
| show ip protocols |  |

## 45.20 route-target

VRF RT

[no] route-target {import|export|both} rt\_value

|        |               |
|--------|---------------|
|        |               |
| import | import RT     |
| export | export RT     |
| both   | import export |

Route-Target

VRF

VRF

RT

```
Ruijie(config)# ip vrf vrf1
Ruijie(config-vrf)# route-target import 100:1
Ruijie(config-vrf)# route-target export 100:2
Ruijie(config-vrf)# route-target both 100:4
```

|        |     |
|--------|-----|
|        |     |
| ip vrf | vrf |

## 45.21 show ip bgp vpnv4

VPN

```
show ip bgp vpnv4 all [network | neighbor [ address] | summary |
label]
show ip bgp vpnv4 vrf vrf_name [network | summary | label]
show ip bgp vpnv4 rd rd_value [network | neighbor [ address] |
summary | label]
```

|          |    |
|----------|----|
|          |    |
| network  |    |
| neighbor | or |



|          |                |
|----------|----------------|
| Metric   |                |
| Localprf |                |
| Path     | AS-path        |
| i        | ORIGIN IGP     |
| e        | ORIGIN EGP     |
| ?        | ORIGIN IGP EGP |

## 45.22 show ip route vrf

VRF

**show ip route vrf** *vrf\_name* [*A.B.C.D mask*] **bgp** | **connected** | **isis** | **ospf** | **rip** | **static**

|                     |      |
|---------------------|------|
|                     |      |
| <i>vrf_name</i>     | VRF  |
| <i>A.B.C.D mask</i> |      |
| <b>bgp</b>          | BGP  |
| <b>connected</b>    |      |
| <b>isis</b>         | ISIS |
| <b>ospf</b>         | OSPF |
| <b>rip</b>          | RIP  |
| <b>static</b>       |      |

```
Ruijie# show ip route vrf vrf1
Codes: C - connected, S - static, R - RIP, B - BGP
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
```

```

i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2   ia
- IS-IS inter area
* - candidate default
B   192.168.0.1/32 , [200/0] via 192.168.0.2, 01:02:33
B   192.168.0.3/32 , [200/0] via 192.168.4.1 , 01:02:33
C   192.168.4.0/24 is directly connected ,eth1
    
```

|                    |     |
|--------------------|-----|
|                    |     |
| <b>show ip vrf</b> | vrf |

### 45.23 show ip vrf

VRF

**show ip vrf** [*vrf-name*]

*vrf-name*                    VRF

RF                    VRF                    VRF                    V

```

Ruijie# show ip vrf vrf1
VRF pe1 default RD 100 2
Interfaces
Eth0
Export VPN route-target communities
RT 100 30
No import VPN route-target community
No import route-map
    
```

|                     |     |
|---------------------|-----|
|                     |     |
| <b>ip vrf</b>       | VRF |
| <b>rd</b>           | RD  |
| <b>route-target</b> | RT  |

|                          |     |
|--------------------------|-----|
| <b>ip vrf forwarding</b> | VRF |
|--------------------------|-----|

---

# 46

## 46.1

- ' **storm-control**
- ' **switchport protected**
- ' **switchport port-security**
- ' **switchport port-security aging**
- ' **switchport port-security mac-address**
- ' **port-security arp-check**

### 46.1.1 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**

*percent*

20 20%

*packets* pps

packets per second

*Rate-bps*

*64k-2M* 64k

*2-100M* 1M

*100M* 8M



---

3

**show interfaces**

```
Ruijie(config)# interface gigabitethernet 1/1  
Ruijie(config-if)# switchport protected
```

| show interfaces |  |
|-----------------|--|

### 46.1.3 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 |

IP( )  
)

MAC  
(

1

---

---

## port-security aging static

### show port-security

```
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# switchport port-security aging time
8
Ruijie(config-if)# switchport port-security aging
static
```

|                    |  |
|--------------------|--|
|                    |  |
| show port-security |  |

## 46.1.5 switchport port-security mac-address

no

**switchport port-security** [**mac-address** *mac-address* [**ip-address** {*ip-address* | *ipv6-address*}]] | [**maximum** *value*]

**no switchport port-security** [**mac-address** *mac-address* [**ip-address** {*ip-address* | *ipv6-address*}]] | [**maximum**]

|                                       |   |      |
|---------------------------------------|---|------|
|                                       | ' |      |
| <b>mac-address</b> <i>mac-address</i> | ' |      |
| <b>ip-address</b> <i>ip-address</i>   | ' | ID   |
| <b>ip-address</b> <i>ipv6-address</i> | ' | IDJ* |

**maximum**

---

```

ACL          IP          MAC
ACL          ACL        802.1x          IP
                    IP

```

```

                    gigabitethernet 1/1
00d0.f800.073c          IP          192.168.12.202

```

```

Ruijie# configure terminal
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# switchport mode access
Ruijie(config-if)# switchport port-security
Ruijie(config-if)# switchport port-security
mac-address 00d0.f800.073c ip-address 192.168.12.202

```

|                           |  |
|---------------------------|--|
|                           |  |
| <b>show port-security</b> |  |

```

S8600          IP          1K          IP
                84

```

### 46.1.6 arp-check

```

ARP no          default

```

```

[no | default] arp check

```

```

cpu          CPU

```

```

auto :

```

---

Arp-check

Arp

arp

Ruijie(config-if)# **arp-check**

|                           |  |
|---------------------------|--|
|                           |  |
| <b>show port-security</b> |  |

## 46.2

' **show storm-control**

' **show port-security**

### 46.2.1 show storm-control

**show storm-control** [*interface-id*]

|                     |   |
|---------------------|---|
|                     | ' |
| <i>interface-id</i> | ' |

```
Ruijie# show storm-control gigabitethernet 1/1  
Interface Broadcast Control Multicast Control Unicast  
Control  
-----  
Gi1/1 Disabled Disabled Disabled
```

---

|                      |   |
|----------------------|---|
| '                    | ' |
| <b>storm-control</b> | ' |

## 46.2.2 show port-security

**show port-security** [address] [interface *interface-id*]

|                                      |  |
|--------------------------------------|--|
|                                      |  |
| <b>address</b>                       |  |
| <b>interface</b> <i>interface-id</i> |  |

```
Ruijie# show port-security
Secure Port MaxSecureAddr(count) CurrentAddr(count)
Security Action
-----
Gi1/1 128 1 Restrict
Gi1/2 128 0 Restrict
Gi1/3 8 1 Protect
```

|                                             |  |
|---------------------------------------------|--|
|                                             |  |
| <b>switchport port-security</b>             |  |
| <b>switchport port-security aging</b>       |  |
| <b>switchport port-security mac-address</b> |  |

# 47 802.1X

## 47.1 dot1x

```
dot1x
' dot1x auto-req
' dot1x auto-req packet-num
' dot1x auto-req req-interval
' dot1x auto-req user-detect
```

### 47.1.1 dot1x auto-req

```
802.1X dot1x auto-req
no
[no] dot1x auto-req
```

```
802.1x show dot1x auto-req
```

```
802.1x
Ruijie# configure terminal
Ruijie(config)# dot1x auto-req
Ruijie(config)# end
Ruijie(config)# show dot1x auto-req
Auto-Req: Enabled
User-Detect : Enabled
Packet-Num : 0
Req-Interval: 30 Second
```



|                                  |  |
|----------------------------------|--|
| <code>show dot1x auto-req</code> |  |
|----------------------------------|--|

## 47.1.2 dot1x auto-req packet-num

no

**dot1x auto-req packet-num** *num*

**no dot1x auto-req packet-num**

*num*

num = 0;

*interval*

s

30

**show dot1x auto-req**

**show dot1x auto-req**

```

Ruijie# configure terminal
Ruijie(config)# dot1x auto-req user-detect
Ruijie(config)# end
Ruijie# show dot1x auto-req
Auto-Req: Enabled
User-Detect : Enabled
Packet-Num : 0
Req-Interval: 60 Second

```

|                            |  |
|----------------------------|--|
|                            |  |
| <b>show dot1x auto-req</b> |  |

## 47.2 dot1x

dot1x

- ' **dot1x timeout quiet-period**
- ' **dot1x timeout re-authperiod**
- ' **dot1x timeout server-timeout**
- ' **dot1x timeout supp-timeout**
- ' **dot1x timeout tx-period**

### 47.2.1 dot1x timeout quiet-period

**no**

**dot1x timeout quiet-period** *seconds*  
**no dot1x timeout quiet-period**

*seconds*

0 65535 s

10

**show dot1x**

---

```
seconds                0    65535    s
```

```
3600
```

```
show dot1x            802.1x
```

```
1000s
```

```
Ruijie# configure terminal
Ruijie(config)# dot1x timeout re-authperiod 1000
Ruijie(config)# end
Ruijie# show dot1x
802.1X Status:           Enabled
Authentication Mode:     EAP-MD5
Authed User Number:     0
Re-authen Enabled:      Disabled
Re-authen Period:       1000 sec
Quiet Timer Period:     1000 sec
Tx Timer Period:        3 sec
Supplicant Timeout:     3 sec
Server Timeout:         5 sec
Re-authen Max:          3 times
Maximum Request:        3 times
Filter Non-RG Supp:     Disabled
Client Oline Probe:     Disabled
Eapol Tag Enable:       Disabled
Authorization Mode:      Group Server
```

|                   |        |
|-------------------|--------|
|                   |        |
| <b>show dot1x</b> | 802.1x |

### 47.2.3 dot1x timeout server-timeout

```
no
```

```
dot1x timeout server-timeout seconds
```

*seconds* 0  
65535

5

**show dot1x** 802.1x

10s

```
Ruijie# configure terminal
Ruijie(config)# dot1x timeout server-timeout 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:    3 sec
Supplicant Timeout: 3 sec
Server Timeout:     10 sec
Re-authen Max:      3 times
Maximum Request:    3 times
Filter Non-RG Supp: Disabled
Client Oline Probe: Disabled
Eapol Tag Enable:   Disabled
Authorization Mode:  Group Server
```

|                   |        |
|-------------------|--------|
|                   |        |
| <b>show dot1x</b> | 802.1x |

#### 47.2.4 dot1x timeout supp-timeout

no

**dot1x timeout supp-timeout seconds**  
**no dot1x timeout supp-timeout**

*seconds* 0  
 65535

3

**show dot1x** 802.1x

10s

```
Ruijie# configure terminal
Ruijie(config)# dot1x timeout supp-timeout 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:    3 sec
Supplicant Timeout: 10 sec
Server Timeout:     10 sec
Re-authen Max:      3 times
Maximum Request:    3 times
Filter Non-RG Supp: Disabled
Client Oline Probe: Disabled
Eapol Tag Enable:   Disabled
Authorization Mode:  Group Server
```

|                   |        |
|-------------------|--------|
|                   |        |
| <b>show dot1x</b> | 802.1x |

## **47.2.5 dot1x timeout tx-period**



Supplicant Timeout: 10 sec  
Server Timeout: 10 sec  
Re-authen Max: 3 times  
Maximum Request: 3 times  
Filter Non-RG Supp: Disabled  
Client Oline Probe: Disabled  
Eapol Tag Enable: Disabled  
Authorization Mode: Group Server

|                   |        |
|-------------------|--------|
|                   |        |
| <b>show dot1x</b> | 802.1x |

### 47.3.2 dot1x reauth-max

**no**

**dot1x reauth-max** *count*  
**no dot1x reauth-max**

*count*

3

**show dot1x** 802.1x

```
Ruijie# configure terminal  
Ruijie(config)# dot1x reauth-max 5  
Ruijie(config)# end  
Ruijie# show dot1x
```

```
802.1X Status: Enabled  
Authentication Mode: EAP-MD5  
Authed User Number: 0
```

```

Re-authen Enabled:    Enabled
Re-authen Period:    1000 sec
Quiet Timer Period:  1000 sec
Tx Timer Period:     10 sec
Supplicant Timeout:  10 sec
Server Timeout:      10 sec
Re-authen Max:       5 times
Maximum Request:     3 times
Filter Non-RG Supp:  Disabled
Client Oline Probe:  Disabled
Eapol Tag Enable:    Disabled
Authorization Mode:   Group Server

```

|                   |        |
|-------------------|--------|
|                   |        |
| <b>show dot1x</b> | 802.1x |

## 47.4 dot1x

- ' **dot1x probe-timer**
- ' **dot1x client-probe enable**

### 47.4.1 dot1x probe-timer

```

dot1x probe-timer{interval | alive}interval
no dot1x probe-timer

```

**no**

*interval* 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
```

|                               |  |
|-------------------------------|--|
|                               |  |
| <b>Show dot1x probe-timer</b> |  |

```

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: Enabled
Eapol Tag Enable:   Disabled
Authorization Mode:  Group Server

```

|                   |       |
|-------------------|-------|
|                   |       |
| <b>show dot1x</b> | dot1x |

## 47.5 dot1x

dot1x

- ' **dot1x authentication**
- ' **dot1x auth-address-table**
- ' **dot1x auth-mode**
- ' **dot1x default**
- ' **dot1x dynamic-vlan enable**
- ' **dot1x guest-vlan enable**
- ' **dot1x eapol-tag**
- ' **dot1x max-req**
- ' **dot1x private-supplicant-only**
- ' **dot1x port-control auto**
- ' **dot1x port-control-mode**
- ' **dot1x stationarity enable**

### 47.5.1 dot1x authentication

AAA

AAA

**no**

**dot1x authentication** {default | *list-name*}

**no dot1x authentication** {default | *list-name*}



**show dot1x**

```

VLAN
Ruijie# configure terminal
Ruijie(config)# dot1x auth-fail max-attempt 5
Ruijie(config)# end
Ruijie#write

```

| <b>show dot1x</b> | 802.1x |
|-------------------|--------|

| - | - |
|---|---|

**47.5.4 dot1x auth-fail vlan**

802.1x          vlan

dot1x auth-fail vlan vid

no dot1x auth-fail vlan

| <i>vid</i> | vlan    vid |
|------------|-------------|

vlan

**show dot1x interface**

```

802.1x          vlan
Ruijie# configure terminal
Ruijie(config)# interface fa 0/1
Ruijie(config-if)# dot1x auth-fail vlan 2
Ruijie(config-if)# end
Ruijie#write

```

|  |                             |        |
|--|-----------------------------|--------|
|  |                             |        |
|  | <b>show dot1x interface</b> | 802.1x |
|  |                             |        |
|  |                             |        |
|  | -                           | -      |

### 47.5.5 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#

|                   |        |
|-------------------|--------|
|                   |        |
| <b>show dot1x</b> | 802.1x |

## 47.5.6 dot1x default

802.1x

**dot1x default**

**show dot1x**            802.1x

802.1x

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

|                   |        |
|-------------------|--------|
|                   |        |
| <b>show dot1x</b> | 802.1x |

## 47.5.7 dot1x dynamic-vlan enable

vlan

**no**

**show dot1x dynamic-vlan** 802.1x

802.1x vlan

```
Ruijie# configure terminal
Ruijie(config)# interface gigabitEthernet 4/5
Ruijie(config-if)# dot1x dynamic-vlan enable
Ruijie(config)# end
Ruijie#
```

|                   |        |
|-------------------|--------|
|                   |        |
| <b>show dot1x</b> | 802.1x |

### 47.5.8 dot1x guest-vlan

**guest vlan** **no**

**dot1x guest-vlan** *vid*  
**no dot1x guest-vlan**

*vid* <1 - 4094>

1. **guest vlan** **dot1x dynamic-vlan enable**  
**guest vlan**
2. **guest vlan**  
**vlan**
3. **show running-config** 802.1x

802.1x guest vlan

```
Ruijie# configure terminal
Ruijie(config)# interface gigabitEthernet 4/5
Ruijie(config-if)# dot1x guest-vlan 10
```

```
Ruijie(config)# end
Ruijie#
```

|                            |        |
|----------------------------|--------|
|                            |        |
| <b>show running-config</b> | 802.1x |

### 47.5.9 dot1x eapol-tag

EAPOL TAG

```
dot1x eapol-tag
no dot1x eapol-tag
```

**show dot1x** 802.1x

802.1X tag

```
Ruijie# configure terminal
Ruijie(config)# dot1x eapol-tag
Ruijie(config)# end
Ruijie#
```

|                   |        |
|-------------------|--------|
|                   |        |
| <b>show dot1x</b> | 802.1x |

### 47.5.10 dot1x mac-auth-bypass

MAC

```
dot1x mac-auth-bypass
```

no dot1x mac-auth-bypass



---

**show run**            802.1x

802.1x MAC

Ruijie# **configure terminal**

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

Ruijie(config-if)# **dot1x mac-auth-bypass timeout-activity 3600**

Ruijie(config-if)# **end**

Ruijie#write

---

|                                          |        |
|------------------------------------------|--------|
| <b>show dot1x port-control interface</b> | 802.1x |
|------------------------------------------|--------|

```
Ruijie(config-if)# dot1x mac-auth-bypass violation
Ruijie(config-if)# end
Ruijie#write
```

|                                          |        |
|------------------------------------------|--------|
|                                          |        |
| <b>show dot1x port-control interface</b> | 802.1x |

|   |   |
|---|---|
|   |   |
| - | - |

### 47.5.13 dot1x max-req

DOT1X

DOT1X

DOT1X

no

**dot1x max-req** *count*

**no dot1x ma87x-req**

*count*

3

**show dot1x**

802.1x

802.1x

7

Ruijie# **configure terminal**

Ruijie(config)# **dot1x max-req 7**

Ruijie(config)# **end**

Ruijie#

|                   |        |
|-------------------|--------|
|                   |        |
| <b>show dot1x</b> | 802.1x |

#### 47.5.14 dot1x private-supPLICANT-only

**no**

**dot1x private-supPLICANT-only**  
**no dot1x private-supPLICANT-only**

**show dot1x private-supPLICANT-only**                      802.1x

```
Ruijie# configure t
Ruijie(config)# dot1x private-supPLICANT-only
Ruijie(config)# end
Ruijie#
```

|                                           |  |
|-------------------------------------------|--|
|                                           |  |
| <b>show dot1x private-supPLICANT-only</b> |  |

#### 47.5.15 dot1x port-control auto

**no**

**dot1x port-control auto**  
**no dot1x port-control**

802.1x

**show dot1x**            802.1x

802.1x

```
Ruijie# configure terminal
Ruijie(config)# interface g0/1
Ruijie(config-if)# dot1x port-control auto
Ruijie(config-if)# end
Ruijie#
```

|                   |        |
|-------------------|--------|
|                   |        |
| <b>show dot1x</b> | 802.1x |

## 47.5.16 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

mac-based

```
show dot1x port-control          802.1x
single-host                      802.1x      show dot1x
port-control                    port-based  show running-config
dot1x port-control-mode port-based single-host
single-host                      default-user-limit
single-host                      single-host
default-user-limit              single-host
```

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#
```

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#
```

**port-based single-host**

802.1x

802.1X

**dot1x stationarity enable****no dot1x stationarity enable**

802.1x

```

Ruijie# configure terminal
Ruijie(config)# dot1x stationarity enable
Ruijie(config)# end
Ruijie#

```

## 47.5.18 dot1x redirect url

802.1x

URL

```

URL      http://      http://ruijie.net/web
http://  https://
          url         url      no
url

```

dot1x redirect url [url-string]

[no ] dot1x redirect url

*url-string*

URL

---

 |
 

---

 |
 

---

 |
 

---

 |
 

---

```

1                ruijie.net/web
Ruijie(config)# dot1x redirect url http://ruijie.net/web
  
```

|                                                        |       |    |    |
|--------------------------------------------------------|-------|----|----|
|                                                        |       |    |    |
| <b>dot1x redirect for special tcp-destination port</b> | web   | ip | ip |
| <b>dot1x redirect time-out</b>                         |       |    |    |
| <b>dot1x redirect num for special source-ip</b>        |       |    |    |
| <b>show dot1x</b>                                      | dot1x |    |    |

---

 |
 

---

[REDACTED]

```

1          TCP          8443
Ruijie(config)#dot1x redirect for special tcp-destination port
8443

```

|                                                 |       |
|-------------------------------------------------|-------|
|                                                 |       |
| <b>dot1x redirect url</b>                       |       |
| <b>dot1x redirect time-out</b>                  |       |
| <b>dot1x redirect num for special source-ip</b> |       |
| <b>show dot1x</b>                               | dot1x |

|   |   |
|---|---|
|   |   |
| - | - |

## 47.5.20 dot1x redirect time-out

no ( ), 3 1-10

**dot1x redirect time-out port *time-out-interval***

**no dot1x redirect time-out port**

|                          |  |
|--------------------------|--|
|                          |  |
| <i>time-out-interval</i> |  |

3

```

1          5
Ruijie(config)# dot1x redirect time-out 5

```

|  |  |
|--|--|
|  |  |
|--|--|

**dot1x redirect url**

web

ip

ip

|                                |  |
|--------------------------------|--|
| <b>dot1x redirect time-out</b> |  |
|--------------------------------|--|

|                   |  |
|-------------------|--|
| <b>show dot1x</b> |  |
|-------------------|--|

|  |       |
|--|-------|
|  | dot1x |
|--|-------|

```
Ruijie# show dot1x
802.1X Status:      Enabled
Authentication Mode: EAP-MD5
Authed User Number: 0
Re-authen Enabled:  Disabled
Re-authen Period:   3600 sec
Quiet Timer Period: 10 sec
Tx Timer Period:    3 sec
Supplicant Timeout: 3 sec
Server Timeout:     5 sec
Re-authen Max:      3 times
Maximum Request:    3 times
Filter Non-RG Supp: Disabled
Client Oline Probe: Disabled
Eapol Tag Enable:   Disabled
Authorization Mode:  Group Server
Ruijie#
```

|                        |               |
|------------------------|---------------|
|                        |               |
| <b>dot1x auth-mode</b> | <b>802.1x</b> |

## 47.6.2 show dot1x auth-address-table

802.1X

```
show dot1x auth-address-table [address mac-addr] [interface  
interface-id]
```

*mac-addr*

*interface*

```
Ruijie# show dot1x auth-address-table  
interface:g3/1  
-----  
mac addr: 00D0.F800.0001  
Ruijie#
```

|                        |        |
|------------------------|--------|
|                        |        |
| <b>dot1x auth-mode</b> | 802.1x |
| <b>dot1x max-req</b>   |        |

|                                     |  |
|-------------------------------------|--|
| <b>dot1x timeout server-timeout</b> |  |
| <b>dot1x timeout supp-timeout</b>   |  |
| <b>dot1x timeout tx-period</b>      |  |

### 47.6.3 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  
Ruijie#
```

| <b>dot1x auth-mode</b>         | 802.1x |
|--------------------------------|--------|
| <b>dot1x max-req</b>           |        |
| <b>dot1x port-control auto</b> |        |
| <b>dot1x reauth-max</b>        |        |

|                                     |  |
|-------------------------------------|--|
| <b>dot1x re-authentication</b>      |  |
| <b>dot1x timeout quiet-period</b>   |  |
| <b>dot1x timeout re-authperiod</b>  |  |
| <b>dot1x timeout server-timeout</b> |  |
| <b>dot1x timeout supp-timeout</b>   |  |
| <b>dot1x timeout tx-period</b>      |  |

#### 47.6.4 show dot1x private-supPLICANT-only

**show dot1x private-supPLICANT-only**

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

|                                |        |
|--------------------------------|--------|
|                                |        |
| <b>dot1x auth-mode</b>         | 802.1x |
| <b>dot1x max-req</b>           |        |
| <b>dot1x port-control auto</b> |        |

|                                     |  |
|-------------------------------------|--|
| <b>dot1x reauth-max</b>             |  |
| <b>dot1x re-authentication</b>      |  |
| <b>dot1x timeout quiet-period</b>   |  |
| <b>dot1x timeout re-authperiod</b>  |  |
| <b>dot1x timeout server-timeout</b> |  |
| <b>dot1x timeout supp-timeout</b>   |  |
| <b>dot1x timeout tx-period</b>      |  |

### 47.6.5 show dot1x max-req

**show dot1x max-req**

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

|                        |        |
|------------------------|--------|
|                        |        |
| <b>dot1x auth-mode</b> | 802.1x |
| <b>dot1x max-req</b>   |        |

|                                     |  |
|-------------------------------------|--|
| <b>dot1x port-control auto</b>      |  |
| <b>dot1x reauth-max</b>             |  |
| <b>dot1x re-authentication</b>      |  |
| <b>dot1x timeout quiet-period</b>   |  |
| <b>dot1x timeout re-authperiod</b>  |  |
| <b>dot1x timeout server-timeout</b> |  |

**dot1x timeout supp-timeout**

|                                        |            |
|----------------------------------------|------------|
| '                                      | '          |
| ' Xch% Ui h\! acXY                     | ' , \$&" % |
| ' Xch% aUi ! fYe                       | '          |
| ' Xch% dcfh! Wtbhfc` Ui hc             | '          |
| ' Xch% fYUi h\! aUi                    | '          |
| ' Xch% fY! Ui h\Ybh] W]h] cb           | '          |
| ' Xch% h] aYci h<br>ei ] Yh! dYf] cX   | '          |
| ' Xch% h] aYci h<br>fY! Ui h\dYf] cX   | '          |
| ' Xch% h] aYci h<br>gYfj Yf! h] aYci h | '          |
| ' Xch% h] aYci h<br>gi dd! h] aYci h   | '          |
| ' Xch% h] aYci h hl ! dYf] cX          | '          |

## 47.6.7 show dot1x probe-timer

**show dot1x probe-timer**

```
Ruijie# show dot1x probe-timer
Hello Interval: 20 Seconds
Hello Alive: 250 Seconds
Ruijie#
```

|  |  |
|--|--|
|  |  |
|--|--|

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

#### 47.6.8 show dot1x re-authentication

**show dot1x re-authentication**

```
Ruijie# show dot1x re-authentication
reauth-enabled: disabled
Ruijie#
```

|                        |        |
|------------------------|--------|
|                        |        |
| <b>dot1x auth-mode</b> | 802.1x |

---

.

---

---

|                              |                                                         |
|------------------------------|---------------------------------------------------------|
| ' Xch% aU ! fYe              | '                                                       |
| ' Xc Xch% dcf% aU hfcYe U hc | ' A'5B y ·hp>Gj „AxA• õ ,át-q @H ‡ 'z ,D „ G ` .át-q @h |
| ' Xch% fYU h\! aU            | '                                                       |

Authed      Static  
Ruijie#

| <b>dot1x auth-mode</b>         | 802.1x |
|--------------------------------|--------|
| <b>dot1x max-req</b>           |        |
| <b>dot1x port-control auto</b> |        |

```

Ruijie# show dot1x user id 1
User name: caikov
id: 1
Type: static
Mac address is 0013.2049.8272
Vlan id is 217
Access from port Gi0/13
User ip address is 192.168.217.64
Max user number on this port is 6000
COS on this port is 5
Up-bandwidth is 1024 kbps
Down-bandwidth is 1024 kbps
Authorization vlan is dep7
Authorization session time is 1000000 seconds
Authorization ip address is 192.168.217.64
Start accounting
Permit proxy user
Permit dial user
IP privilege is 2

```

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

#### 47.6.12 show dot1x timeout

**show dot1x timeout quiet-period**  
**show dot1x timeout re-authperiod**  
**show dot1x timeout server-timeout**  
**show dot1x timeout supp-timeout**  
**show dot1x timeout tx-period**

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

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

# 48 AAA

## 48.1

- ' **aaa authentication dot1x**
- ' **aaa authentication enable**
- ' **aaa authentication login**
- ' **aaa authentication ppp**
- ' **login authentication**

### 48.1.1 aaa authentication dot1x

|                             |        |            |
|-----------------------------|--------|------------|
| AAA                         | 802.1X | <b>aaa</b> |
| <b>authentication dot1x</b> | 802.1X | no         |
| 802.1X                      |        |            |

**aaa authentication dot1x** {default | *list-name*} *method1* [*method2...*]

**no aaa authentication dot1x** {default

```

AAA 802.1X AAA 802.1X
aaa authentication dot1x
802.1X

```

```

rds_d1x AAA 802.1X
RADIUS RADIUS

```

```

Ruijie(config)# aaa authentication dot1x rds_d1x group
radius local

```

| aaa new-model        | AAA    |
|----------------------|--------|
| dot1x authentication | 802.1X |
| username             |        |

## 48.1.2 aaa authentication enable

```

AAA Enable aaa authentication
enable Enable no

```

```

aaa authentication enable default method1 [method2...]

```

```

no aaa authentication enable default

```

```

default Enable
Enable

```

```

method 4

```

| local |        |
|-------|--------|
| none  |        |
| group | RADIUS |

AAA Enable AAA Enable  
**aaa authentication enable**  
 Enable

Enable Enable

AAA Enable  
 RADIUS RADIUS

Ruijie(config)# **aaa authentication enable default group  
 radius local**

|                      |     |
|----------------------|-----|
|                      |     |
| <b>aaa new-model</b> | AAA |
| <b>enable</b>        |     |
| <b>username</b>      |     |

### 48.1.3 aaa authentication login

AAA Login **aaa**  
**authentication login** Login no

**aaa authentication login {default | list-name} method1 [method2...]**

**no aaa authentication login {default | list-name}**

**default** Login

*list-name* Login

*method* 4

|              |                |
|--------------|----------------|
|              |                |
| <b>local</b> |                |
| <b>none</b>  |                |
| <b>group</b> | RADIUS TACACS+ |

AAA AAA Login

**aaa authentication login**

Login

Login

Login

list-1 AAA Login

RADIUS

RADIUS

```
Ruijie(config)# aaa authentication login list-1 group
radius local
```

|                             |       |
|-----------------------------|-------|
|                             |       |
| <b>aaa new-model</b>        | AAA   |
| <b>username</b>             |       |
| <b>login authentication</b> | Login |

#### 48.1.4 aaa authentication ppp

AAA PPP **aaa**  
**authentication ppp** PPP no

```
aaa authentication ppp {default | list-name} method1 [method2...]
```

```
no aaa authentication ppp {default | list-name}
```

```
default PPP
```

```
list-name PPP
```

```
method 4
```

|              |        |
|--------------|--------|
|              |        |
| <b>local</b> |        |
| <b>none</b>  |        |
| <b>group</b> | RADIUS |

```
AAA PPP AAA PPP
aaa authentication ppp
PPP
```

```
rds_ppp AAA PPP
RADIUS RADIUS
```

```
Ruijie(config)# aaa authentication ppp rds_ppp group
radius local
```

|                           |     |
|---------------------------|-----|
|                           |     |
| <b>aaa new-model</b>      | AAA |
| <b>ppp authentication</b> | PPP |
| <b>username</b>           |     |

## 48.1.5 login authentication

```

                                Login
        login authentication      Login
no
login authentication {default | list-name}
no login authentication

default                      Login
list-name                       Login
    
```

```

                                Login
                                Login
                                Login
                                Login
                                Login
                                Login
                                list-1 AAA Login
                                VTU 0 - 4
Ruijie(config)# aaa authentication login list-1 local
Ruijie(config)# line vty 0 4
Ruijie(config-line)# login authentication list-1
    
```

| <b>aaa new-model</b>        | AAA   |
|-----------------------------|-------|
| <b>username</b>             |       |
| <b>login authentication</b> | Login |

## 48.2

- ' **aaa authorization commands**
- ' **aaa authorization config-commands**
- ' **aaa authorization console**
- ' **aaa authorization exec**
- ' **aaa authorization network**
- ' **authorization commands**
- ' **authorization exec**

## 48.2.1 aaa authorization commands

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

*level* 0~15

**default**

*list-name*

*method* 4

|              |         |
|--------------|---------|
|              |         |
| <b>none</b>  |         |
| <b>group</b> | TACACS+ |

AAA

AAA

14

14

TACACS+

15

```
Ruijie(config)# aaa authorization commands 15 default
group tacacs+
```

|                               |     |
|-------------------------------|-----|
|                               |     |
| <b>aaa new-model</b>          | AAA |
| <b>authorization commands</b> |     |

## 48.2.2 aaa authorization config-commands

AAA

**aaa authorization config-commands**

no AAA

**aaa authorization config-commands****no aaa authorization config-commands**

no

Ruijie(config)# **aaa authorization config-commands**

| <b>aaa new-model</b>              | AAA |
|-----------------------------------|-----|
| <b>aaa authorization commands</b> | AAA |

### 48.2.3 aaa authorization console

AAA

**aaa authorization console**

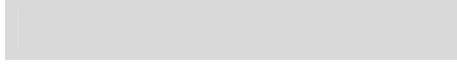
no

AAA

**aaa authorization console**

**no aaa authorization console**

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



RADIUS Exec

```
Ruijie(config)# aaa authorization exec default group
radius
```

| aaa new-model      | AAA |
|--------------------|-----|
| authorization exec |     |
| username           |     |

## 48.2.5 aaa authorization network

```
AAA PPP SLIP
aaa authorization network no
AAA
```

```
aaa authorization network {default | list-name} method1 [method2...]
```

```
no aaa authorization network {default | list-name}
```

```
default Network
```

```
method 4
```

| none  |        |
|-------|--------|
| group | RADIUS |

RADIUS  
RADIUS RADIUS RADIUS  
RADIUS

RADIUS

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

| <b>aaa new-model</b>      | AAA |
|---------------------------|-----|
| <b>aaa accounting</b>     | AAA |
| <b>aaa authentication</b> | AAA |
| <b>username</b>           |     |

## 48.2.6 authorization commands

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

*level* 0~15

**default**

*list-name*

AAA

```

                                cmd                15
TACACS+                          none
                                VTY 0 - 4

```

```
Ruijie(config)# aaa authorization commands 15 cmd group
tacacs+ none
```

```
Ruijie(config)# line vty 0 4
```

```
Ruijie(config-line)# authorization commands 15 cmd
```

|                                   |     |
|-----------------------------------|-----|
|                                   |     |
| <b>aaa new-model</b>              | AAA |
| <b>aaa authorization commands</b> | AAA |

## 48.2.7 authorization exec

```

                                Exec
authorization exec                no                Exec

```

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

```
no authorization exec
```

```
default                            Exec
```

```
list-name                            Exec
```

```
AAA Exec
```

```

Exec
    Exec

```

```

                                Exec
                                Exec
                                exec-1  Exec          RADIUS
                                none          VTY
0 - 4
Ruijie(config)# aaa authorization exec exec-1 group
radius none
Ruijie(config)# line vty 0 4
Ruijie(config-line)# authorization exec exec-1

```

|                                   |          |
|-----------------------------------|----------|
|                                   |          |
| <b>aaa new-model</b>              | AAA      |
| <b>aaa authorization commands</b> | AAA Exec |

## 48.3

```

                                RADIUS
' aaa accounting commands
' aaa accounting exec
' aaa accounting network
' aaa accounting update
' aaa accounting update periodic
' accounting commands
' accounting exec

```

### 48.3.1 aaa accounting commands

```

                                NAS
aaa accounting commands level no
aaa accounting commands level {default | list-name} start-stop
method1 [method2...]
no aaa accounting commands level {default | list-name}

```



aaa accounting exec      NAS      no      Exec

| <b>aaa new-model</b>       | AAA  |
|----------------------------|------|
| <b>aaa authentication</b>  | AAA  |
| <b>accounting commands</b> | Exec |

### 48.3.3 aaa accounting network

```
aaa accounting network no
```

```
aaa accounting network {default | list-name} start-stop group radius
```

```
no aaa accounting network {default | list-name}
```

```
network DOT1X PPP
```

```
resource
```

```
list-name
```

```
start-stop
```

```
group
```

```
radius RADIUS
```

```
start-stop
```

```
RADIUS
```

```
Ruijie(config)# aaa accounting network default
start-stop group radius
```

| <b>aaa new-model</b>             | AAA |
|----------------------------------|-----|
| <b>aaa authorization network</b> | AAA |
| <b>aaa authentication</b>        | AAA |
| <b>username</b>                  |     |

### 48.3.4 aaa accounting update

```
aaa accounting update
no
```

```
aaa accounting update
no aaa accounting update
```

AAA

AAA

```
Ruijie(config)# aaa new-model
Ruijie(config)#
```

| <b>aaa new-model</b>          | AAA |
|-------------------------------|-----|
| <b>aaa accounting network</b> |     |

### 48.3.5 aaa accounting update periodic

```

periodic                                aaa accounting update
   no

```

```
aaa accounting update periodic interval
```

```
no aaa accounting update periodic
```

```
interval                                1
```

```
5 minutes
```

AAA

AAA

1

```
Ruijie(config)# aaa new-model
```

```
Ruijie(config)# aaa accounting update
```

```
Ruijie(config)# aaa accounting update periodic 1
```

|                        |     |
|------------------------|-----|
|                        |     |
| aaa new-model          | AAA |
| aaa accounting network |     |

### 48.3.6 accounting commands

```
accounting commands                    no
```

```
accounting commands level {default
```

*level* 0~15

**default**

*list-name*

```
                                cmd          15      none
TACACS+
VTY 0 - 4
Ruijie(config)# aaa accounting commands
```

*list-name*

**no aaa group server** {radius | tacacs+} *name*

|             |        |         |        |         |
|-------------|--------|---------|--------|---------|
| <i>name</i> |        |         | radius | tacacs+ |
|             | 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 |

## 48.4.2 ip vrf forwarding

AAA vrf no

**ip vrf forwarding** *vrf-name*

**no ip vrf forwarding**

*vrf-name* vrf

vrf

```
Ruijie(config)# aaa group server radius ss
Ruijie(config-gs-radius)# server 192.168.4.12
Ruijie(config-gs-radius)# server 192.168.4.13
Ruijie(config-gs-radius)# ip vrf forwarding vrf-name
Ruijie(config-gs-radius)# end
```

|                         |     |
|-------------------------|-----|
|                         |     |
| <b>aaa group server</b> | aaa |
| <b>show aaa group</b>   | aaa |

### 48.4.3 server

AAA                      no

**server** *ip-address* [**auth-port** *port1*] [**acct-port** *port2*]**no server** *ip-address* [**auth-port** *port1*] [**acct-port** *port2*]*ip-address*              ip*port1*                      RADIUS*port2*                      RADIUS

```
Ruijie(config)# aaa group server radius ss
Ruijie(config-gs-radius)# server 192.168.4.12
acct-port 5 auth-port 6
Ruijie(config-gs-radius)# end
Ruijie# show aaa group
Group Name: ss
Group Type: radius
Referred: 2
Server List:
IP Address: 192.168.4.12
Authentication Port: 6
Accounting Port: 5
Referred: 1
```

| <b>aaa group server</b> | aaa |
|-------------------------|-----|
| <b>show aaa group</b>   | aaa |

#### 48.4.4 show aaa group

AAA

**show aaa group**

Đ

Referred: 2  
Server List:  
IP Address: 192.168.217.64  
Authentication Port: 1812  
Accounting Port: 1813  
Referred: 1

|                         |     |
|-------------------------|-----|
|                         |     |
| <b>aaa group server</b> | AAA |

## 48.5 AAA

- ' **aaa local authentication attempts**
- ' **aaa local authentication lockout-time**
- ' **aaa new-model**
- ' **clear aaa local user lockout**
- ' **debug aaa**
- ' **show aaa method-list**
- ' **show aaa user lockout**

### 48.5.1 aaa local authentication attempts

login

~~aaa login authentication (attempts) 4 (authentication) 1 .12 ref 0 g BT /~~

```
Ruijie# configure terminal
Ruijie(config)# aaa local authentication attempts 6
```

| <b>show running-config</b> |       |
|----------------------------|-------|
| <b>show aaa lockout</b>    | login |

## 48.5.2 aaa local authentication lockout-time

login

**aaa local authentication lockout-time** *lockout-time*

*lockout-time* 1~2147483647

15

login

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

| <b>show running-config</b> |       |
|----------------------------|-------|
| <b>show aaa lockout</b>    | login |

## 48.5.3 aaa new-model

---

```

AAA          AAA          aaa new-model
AAA          no          AAA
aaa new-model
no aaa new-model

```

```
AAA
```

```

AAA          AAA          AAA          AAA          AAA
aaa new-model AAA          AAA          AAA

```

```

AAA
Ruijie(config)# aaa new-model

```

| aaa authentication |  |
|--------------------|--|
| aaa authorization  |  |
| aaa accounting     |  |

#### 48.5.4 clear aaa local user logout

```
clear aaa local user logout {all | user-name <word>}
```

```
<word>      ID
```

```
Ruijie# clear aaa local user lockout all
```

|                            |       |
|----------------------------|-------|
|                            |       |
| <b>show running-config</b> |       |
| <b>show aaa lockout</b>    | login |

### 48.5.5 debug aaa

AAA

no

**debug aaa event**

**no debug aaa event**

EXEC

### 48.5.6 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
```

| <b>aaa authentication</b> |  |
|---------------------------|--|
| <b>aaa authorization</b>  |  |
| <b>aaa accounting</b>     |  |

### 48.5.7 show aaa user logout

```
show aaa user logout {all | user-name <word>}
```

```
<word>      ID
```

```
Ruijie# show aaa user logout all
```

|                            |       |
|----------------------------|-------|
|                            |       |
| <b>show running-config</b> |       |
| <b>show aaa lockout</b>    | login |

# 49 RADIUS

## 49.1 RADIUS

RADIUS

```
' ip radiusradius source-interface
' radius-server attribute 31
' radius-server host
' radius-server key
' radius-server retransmit
' radius-server timeout
' radius-server dead-time
' radius attribute
' radius set qos cos
' radius vendor-specific extend
```

### 49.1.1 ip radius source-interface

```
radius ip radius
source-interface no RADIUS
ip radius source-interface interface
no radius source-interface
```

*Interface* radius

radius

```
radius nas
radius ip
radius
```

```

radius                               fastEthernet 0/0          ip
radius
Ruijie(config)# ip radius source-interface
fastEthernet 0/0
    
```

|                           |        |
|---------------------------|--------|
|                           |        |
| <b>radius-server host</b> | RADIUS |
| <b>ip address</b>         | ip     |

### 49.1.2 radius-server attribute 31

```

RADIUS Calling-Station-ID          MAC
radius-server attribute 31         no
    
```

```

radius-server attribute 31 mac format {ietf | normal | unformatted}
no radius-server attribute 31 mac format
    
```

```

ietf:      ETF RFC3580          -
           00-D0-F8-33-22-AC
    
```

```

normal:           MAC
.                00d0.f833.22ac
    
```

```

unformatted:
00d0f83322ac
    
```

unformatted

```

RADIUS                               802.1x          IETF
Calling-Station-ID
    
```

|                           |        |
|---------------------------|--------|
|                           |        |
| <b>radius-server host</b> | RADIUS |

### 49.1.3 radius-server host

```

RADIUS                                radius-server
no                                     RADIUS

radius-server host ip-address [auth-port port-number] [acct-port
port-number]
no radius-server host ip-address

```

```

ip-address  RADIUS                    IP
auth-port  RADIUS                    UDP
port-number RADIUS                    UDP                0

acct-port  Radius                    UDP
port-number RADIUS                    UDP                0

```

RADIUS

```

RADIUS  AAA                            RADIUS
radius-server                                RADIUS

```

RADIUS

```
Ruijie(config)# radius-server host 192.168.12.1
```

|                           |     |
|---------------------------|-----|
|                           |     |
| <b>aaa authentication</b> | AAA |



RADIUS

**radius-server retransmit****no****radius-server retransmit** *retries***no radius-server retransmit***retries* RADIUS

3

AAA

RADIUS

4

Ruijie(config)# **radius-server retransmit 4**

|                              |        |
|------------------------------|--------|
|                              |        |
| <b>radius-server host</b>    | RADIUS |
| <b>radius-server key</b>     | RADIUS |
| <b>radius-server timeout</b> | RADIUS |

### 49.1.6 radius-server timeout

RADIUS

**radius-server timeout****no****radius-server timeout** *seconds***no radius-server timeout***seconds*

1-1000

5

10

```
Ruijie(config)# radius-server timeout 10
```

| radius-server host       | RADIUS |
|--------------------------|--------|
| radius-server retransmit | RADIUS |
| radius-server key        | RADIUS |

### 49.1.7 radius-server deadtime

```

t
t      t
      deadtime  RGOS      RADIUS
      radius-server deadtime
no
radius-server deadtime minutes
no radius-server deadtime

minutes      1-1000

```

5

10



|    |                   |    |
|----|-------------------|----|
| 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 privilige      | 22 |
| 23 | login privilige   | 42 |

| <b>id</b> |                   | <b>type</b> |
|-----------|-------------------|-------------|
| 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          |

RADIUS

---

|    |                   |    |
|----|-------------------|----|
| 16 | max up-rate       | 75 |
| 17 | version to server | 17 |

qos            cos            dscp

Ruijie(config)# **radius set qos cos**

|                                      |              |
|--------------------------------------|--------------|
|                                      |              |
| <b>radius vendor-specific extend</b> | Radius<br>id |

### 49.1.10 radius vendor-specific extend

id

**radius vendor-specific extend**  
**no radius vendor-specific extend**

id

id

Ruijie(config)# **radius vendor-specific extend**

|                         |                    |
|-------------------------|--------------------|
|                         |                    |
| <b>radius attribute</b> |                    |
| <b>radius set</b>       | qos            cos |

## 49.2 RADIUS

- ' **debug radius [event | detail]**
- ' **show radius server**
- ' **show radius parameter**
- ' **show radius vendor-specific**

### 49.2.1 debug radius

```
RADIUS                                no                                RADIUS
debug radius {event | detail}
no debug radius {event | detail}
```

EXEC

### 49.2.2 show radius server

```
RADIUS
show radius server
```

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        | RADIUS |
| radius-server timeout    | RADIUS |

### 49.2.3 show radius parameter

RADIUS

**show radius parameter**

radius

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

|                                 |        |
|---------------------------------|--------|
| <b>radius-server host</b>       | RADIUS |
| <b>radius-server retransmit</b> | RADIUS |
| <b>radius-server key</b>        | RADIUS |
| <b>radius-server timeout</b>    | RADIUS |

## 49.2.4 show radius vendor-specific

RADIUS

**show radius vendor-specific**

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
9       file-directory       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 privilige         | 22 |
| 23 | login privilige      | 42 |
| 24 | limit to user number | 50 |

| <b>radius-server host</b>       | RADIUS |
|---------------------------------|--------|
| <b>radius-server retransmit</b> | RADIUS |
| <b>radius-server key</b>        | RADIUS |
| <b>radius-server timeout</b>    | RADIUS |

---

# 50 TACACS+

## 50.1 TACACS+

TACACS+

```
'  aaa group server tacacs+
'  server(TACACS+)
'  ip vrf forwarding(TACACS+)
'  ip tacacs source-interface
'  tacacs-server host
'  tacacs-server key
'  tacacs-server timeout
```

### 50.1.1 aaa group server tacacs+

TACACS+

TACACS+

```
aaa group server tacacs+ group-name
no aaa group server tacacs+ group-name
```



### 50.1.3 ip vrf forwarding(TACACS+)

```

TACACS+
)
ip vrf forwarding vrf-name
no ip vrf forwarding

vrf-name vrf

```

TACACS+

```

TACACS+ vrf

TACACS+ VRF vpn1
Ruijie(config)# aaa group server tacacs+ tac1
Ruijie(config-gs-radius)# server 1.1.1.1
Ruijie(config-gs-radius)# ip vrf forwarding vpn1

```

|                                 |                   |
|---------------------------------|-------------------|
|                                 |                   |
| <b>aaa group server tacacs+</b> | TACACS+           |
| <b>server</b>                   | TACACS+<br>server |

### 50.1.4 ip tacacs source-interface

```

TACACS+

ip tacacs source-interface interface
no ip tacacs source-interface

Interface TACACS+

```

TACACS+

TACACS+

|                   |    |
|-------------------|----|
|                   |    |
| <b>ip address</b> | ip |

### 50.1.5 tacacs-server host

TACACS+

IP

`tacacs-server host <ip> <key>`

TACACS+

---

TACACS+

AAA

TACACS+

| <b>tacacs-server host</b>    | TACACS+ |
|------------------------------|---------|
| <b>tacacs-server timeout</b> | TACACS+ |

## 50.1.7 tacacs-server timeout

TACACS+

**tacacs-server timeout** *seconds*

**no tacacs-server timeout**

*seconds*

1-1000

5

EÝNM 6~AÄE;µ>Â đđÄÖáo đÄ5@Ä`µ´5'¼† B Ä Rd5

## 50.2.1 debug tacacs+

|                         |    |         |
|-------------------------|----|---------|
| TACACS+                 | no | TACACS+ |
| <b>debug tacacs+</b>    |    |         |
| <b>no debug tacacs+</b> |    |         |

# 51 SSH

## 51.1 SSH

SSH

- ' **crypto key generate**
- ' **crypto key zeroize**
- ' **ip ssh version**
- ' **ip ssh time-out**
- ' **ip ssh authentication-retries**

### 51.1.1 crypto key generate

**crypto key generate {rsa | dsa}**

|            |     |
|------------|-----|
|            |     |
| <b>rsa</b> | RSA |
| <b>dsa</b> | DSA |

SSH Server

```

SSH Server
enable service ssh-server
SSH 1  RSA  SSH 2  RSA
      RSA  SSH1  SSH2
DSA      SSH2
SSH
SSH Server
DSA

```

**key zeroize**                      **no crypto key generate**                      **crypto**

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



```
show ip ssh
```

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



```
Ruijie# configure terminal  
Ruijie(config)# ip ssh version 2
```

|                    |            |
|--------------------|------------|
|                    |            |
| <b>show ip ssh</b> | SSH Server |

RGOS10.1

### 51.1.4 ip ssh time-out

SSH Server

**no****ip ssh time-out** *time***no ip ssh time-out**

|             |  |
|-------------|--|
|             |  |
| <i>time</i> |  |

|                          |            |
|--------------------------|------------|
| <code>show ip ssh</code> | ssh-server |
|--------------------------|------------|

RGOS10.1

### **51.1.5 ip ssh authentication-retries**

SSH Server

## 51.2 SSH

SSH

' **show ip ssh**

' **show ssh**

' **show crypto key mypubkey 1992 IPv4Server(ssh)]T/C2\_0 1 Tf0 Tc 5.5 7.022**

RGOS10.1

## 51.2.2 show ssh

SSH

**show ssh**

SSH

VTY

SSH

Ruijie# **show ssh**

RGOS10.1

## 51.2.3 show crypto key mypubkey

SSH Server

**show crypto key mypubkey {rsa/dsa}**



## SSH Server

```
Ruijie# show crypto key mypubkey rsa
```

| crypto key generate {rsa   dsa} | DSA RSA |
|---------------------------------|---------|

RGOS10.1

### 51.2.4 disconnect ssh

```
00W02+(A00HQp0(mprQh.Vq0MAcJM
```

| <b>show ssh</b>                          | SSH |
|------------------------------------------|-----|
| <b>Clear line vty <i>line_number</i></b> | VTY |

RGOS10.1

## 52 CPU

### 52.1

- ' **cpu-protect type** *packet-type* **pps** *pps\_value*
- ' **cpu-protect type** *packet-type* **pri** *pri\_value*

#### 52.1.1 **cpu-protect type packet-type pps pps\_value**

CPU

**cpu-protect type** { **arp** | **bpdu** | **dhcp** | **ipv6mc** |

```

pri_num  ID          0 7
          0

```

```

BPDU          7

```

```

Ruijie(config)# cpu-protect type bpdu pri 7
Set packet type bpdu pri 7.

```

| <b>cpu-protect type packet-type</b> |  |
|-------------------------------------|--|
| <b>pps pps_value</b>                |  |

## 52.2

CPU

- ' **show cpu-protect mboard**
- ' **show cpu-protect slot slot-id**
- ' **show cpu-protect type packet-type**

### 52.2.1 show cpu-protect mboard

CPU

```

show cpu-protect mboard

```

CPU

S9610 CPU

```

Ruijie# show cpu-protect mboard
Type          Pps          Total          Drop

```

```

-----
arp          500      19      0
bpd         200      24      0
dhcp         0         0       0
gvrp         0         0       0
ipv6-mc      0         0       0
dvmrp        0         0       0
igmp         0         0       0
ospf         0         0       0
pim          0         0       0
rip          0         0       0
vrrp         0         0       0
unknow-ipmc  0         0       0
ttl1         0         0       0
...

```

| <b>show cpu-protect slot <i>slot-num</i></b> | CPU |
|----------------------------------------------|-----|

## 52.2.2 show cpu-protect slot

CPP

```
show cpu-protect slot slot_num
```

```
slot_num          1-16
```

CPP

2 CPU

```

Ruijie(config)# show cpu-protect slot 2
Type          Pps      Total    Drop
-----
arp           200      200      15
bpd           200       8        0
dhcp          200       0        0

```

|             |     |   |   |
|-------------|-----|---|---|
| gvrp        | 200 | 0 | 0 |
| ipv6-mc     | 200 | 0 | 0 |
| dvmrp       | 200 | 0 | 0 |
| igmp        | 200 | 0 | 0 |
| ospf        | 200 | 0 | 0 |
| pim         | 200 | 0 | 0 |
| rip         | 200 | 0 | 0 |
| vrrp        | 200 | 0 | 0 |
| unknow-ipmc | 200 | 0 | 0 |
| tll1        | 20  | 3 | 0 |

|                                |     |
|--------------------------------|-----|
|                                |     |
| <b>show cpu-protect mboard</b> | CPU |

### 52.2.3 show cpu-protect type

**show cpu-protect type { arp | bpdu | dhcp | ipv6mc | igmp | rip | ospf | vrrp | pim | ttl1 | unknown-ipmc | dvmrp } *dvmrp***

**show cpu-protect type bpdu**                      BPDU

```
Ruijie(config)# show cpu-protect type arp
Slot      Type      Pps      Total    Drop
-----
MainBoard bpdu      100      30      0
Slot-2    bpdu      100      30      0
```

|                                                    |     |
|----------------------------------------------------|-----|
|                                                    |     |
| <b>show cpu-protect type</b><br><i>packet-type</i> | CPU |

---

## 53

### 53.1

```
' system-guard enable
' system-guard isolate-time seconds
' system-guard same-dest-ip-attack-packets number
' system-guard scan-dest-ip-attack-packets number
' system-guard detect-maxnum number
' system-guard exception-ip ip mask
' clear system-guard [ interface interface-id [ ip-address
  ip-address ] ]
```

#### 53.1.1 system-guard enable

no

```
system-guard enable
no system-guard enable
```

```
Ruijie(config-if)# system-guard enable
```

```
Ruijie(config-if)# no system-guard enable
```



---

**system-guard same-dest-ip-attack-packets** *number*  
**no system-guard same-dest-ip-attack-packets**



*number*

---

|               |    |      |    |
|---------------|----|------|----|
| <i>number</i> | IP |      |    |
|               | 0  | 1000 | 10 |
|               | 0  |      |    |

10

100

```
Ruijie(config-if)# system-guard
scan-dest-ip-attack-packets 100
```

|                            |  |
|----------------------------|--|
|                            |  |
| <b>system-guard enable</b> |  |

### 53.1.5 system-guard detect-maxnum number

no

**system-guard detect-maxnum** *number*

**no system-guard detect-maxnum**

|               |    |     |     |
|---------------|----|-----|-----|
|               |    |     |     |
| <i>number</i> | IP |     |     |
|               | 1  | 500 | 100 |
|               | 0  |     |     |

100

---

/20

200

Ruijie(config)# **system-guard detect-maxnum 200**

|                            |  |
|----------------------------|--|
|                            |  |
| <b>system-guard enable</b> |  |

### 53.1.6 system-guard exception-ip ip mask

IP                      no

**system-guard exception-ip ip mask**

**no system-guard exception-ip ip mask [all-eip]**

|           |           |
|-----------|-----------|
|           |           |
| <i>ip</i> | <i>ip</i> |

---

```
Ruijie(config)# system-guard exception-ip  
192.168.5.145/24
```



---

**53.2.1 show system-guari2 418.62 0.72 refBT/TT1Qterface 1Qterface-id]**

|                                      |  |
|--------------------------------------|--|
| <b>interface</b> <i>interface-id</i> |  |
|--------------------------------------|--|

```
Ruijie# show system-guard isolated-ip
interface  ip-address      isolate reason
remain-time(second)
-----
Fa 0/1     192.168.5.119    scan ip attack      110
Fa 0/1     192.168.5.109    same ip attack       61
```

|                            |  |
|----------------------------|--|
|                            |  |
| <b>system-guard enable</b> |  |

### 53.2.3 show system-guard detect-ip [interface interface-id]

IP

**show system-guard detect-ip [interface *interface-id*]**

|                                      |  |
|--------------------------------------|--|
|                                      |  |
| <b>interface</b> <i>interface-id</i> |  |

```
Ruijie# show system-guard detect-ip
interface ip-address same ip attack packets scan ip
attack packets
-----
Fa 0/1     192.168.5.118          0          8
Fa 0/1     192.168.5.108         12          2
```

|  |  |
|--|--|
|  |  |
|--|--|

---

|                            |  |
|----------------------------|--|
| <b>system-guard enable</b> |  |
|----------------------------|--|

### 53.2.4 show system-guard exception-ip [interface interface-id]

IP

**show system-guard exception-ip [interface *interface-id*]**

|                                      |  |
|--------------------------------------|--|
|                                      |  |
| <b>interface <i>interface-id</i></b> |  |

```
Ruijie# show system-guard exception-ip
Exception IP Address      Exception Mask
-----
255.255.255.0
192.168.4.11             255.255.255.0
```

|                            |  |
|----------------------------|--|
|                            |  |
| <b>system-guard enable</b> |  |

## 54 DAI

### 54.1 VLAN DAI

```
ip arp inspection vlan
```

#### 54.1.1 ip arp inspection vlan vlan-id

```

          vlan-id          VLAN DAI
no          vlan-id          VLAN DAI
          vlan-id          VLAN DAI

```

```
ip arp inspection vlan vlan-id
```

```
no ip arp inspection vlan [vlan-id]
```

|                |      |
|----------------|------|
|                |      |
| <i>vlan-id</i> | vlan |

```
VLAN DAI
```

```
DAI
```

```
VLAN 1 ARP
```

```
Ruijie(config)# ip arp inspection
```

```
Ruijie(config)# ip arp inspection vlan 1
```

|                                    |          |
|------------------------------------|----------|
|                                    |          |
| <b>show ip arp inspection vlan</b> | VLAN DAI |

## 54.2

### 54.2.1 ip arp inspection trust

```

trust          no          ip arp inspection
ip arp inspection trust
no ip arp inspection trust
    
```

```

ARP          DAI          ARP
    
```

gigabitEthernet 0/19

```

Ruijie(config)# interface gigabitEthernet 0/19
Ruijie(config-if)# ip arp inspection trust
    
```

|                                         |     |
|-----------------------------------------|-----|
|                                         |     |
| <b>show ip arp inspection interface</b> | DAI |

```

NFPP(          )          NFPP
DAI
    
```

## 54.3 DHCP Snooping

```

VLAN          DAI          ARP
          ARP
DHCP Snooping          .          DHCP Snooping
          DHCP Snooping          DHCP Snooping
    
```

# **55 IP Source Guard**

## **55.1 IP Source Guard**

IP Source Guard

· **ip source binding**

### **55.1.1 ip source binding**

|                               |    |
|-------------------------------|----|
|                               |    |
| <b>show ip source binding</b> | IP |

## 55.2 IP Source Guard

IP Source Guard

**ip verify source**

### 55.2.1 ip verify source

```

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

```

IP IP Source Guard
IP + MAC
DHCP Snooping
fastEthernet 0/1 IP Source Guard
Ruijie#
    
```

```
FastEthernet          0/1 ip          active
192.168.4.243        00d0.f801.0101 1
```

|                              |                 |
|------------------------------|-----------------|
|                              |                 |
| <b>show ip verify source</b> | IP Source Guard |

## 55.3 IP Source Guard

```
IP Source Guard
'  show ip verify source
'  show ip source binding
'  debug ip source bind
```

### 55.3.1 show ip verify source

IP Source Guard

```
show ip verify source [interface interface-id]
```

*interface-id*

IP Source Guard

“IP source guard is not configured on the interface FastEthernet 0/10”

IP Source Guard

```
inactive-no-snooping-vlan          DHCP Snooping
VLAN
```

```
inactive-trust-port              DHCP Snooping
```

```
active                            DHCP Snooping
```

```
Ruijie # show ip verify source
```

```

Interface          Filter-type      Filter-mode
Ip-address Mac-address  VLAN
-----
FastEthernet 0/1  ip             active        192.168.4.243
00d0.f801.0101  1
    
```

|                         |                 |
|-------------------------|-----------------|
|                         |                 |
| <b>ip verify source</b> | IP Source Guard |

### 55.3.2 show ip source binding

IP

**show ip source binding** [*ip-address*] [

|                          |  |
|--------------------------|--|
|                          |  |
| <b>ip source binding</b> |  |

### 55.3.3 debug ip source bind

IP Source Guard

**debug ip source bind**

IP Source Guard

IP Source Guard

Ruijie# **debug ip source bind**

## 56 NFPP

### 56.1

NFPP

```
'  cpu-protect sub-interface {manage|protocol|route} pps
'  cpu-protect sub-interface {manage|protocol|route} percent
```

ARP

```
'  arp-guard isolate timeout
'  arp-guard rate-limit
'  arp-guard attack-threshold
'  arp-guard scan-threshold
'  clear arp-guard users
'  clear arp-guard scan
```

#### 56.1.1 cpu-protect sub-interface {manage|protocol|route} pps

```
cpu-protect sub-interface {manage | protocol | route} pps
pps_vaule
```

*pps\_vaule* 1-8192

|          |            |         |
|----------|------------|---------|
| (manage) | 3000       | (route) |
| 3000     | (protocol) | 3000    |

```
Ruijie(config)# cpu-protect sub-interface manage pps
200
```





**permanent**

0

```
Ruijie(config)# arp-guard isolate timeout 180
Ruijie(config)# interface g 0/1
Ruijie(config-if)# arp-guard isolate timeout permanent
```

|                                     |  |
|-------------------------------------|--|
|                                     |  |
| <b>show arp-guard configuration</b> |  |

### 56.1.4 arp-guard rate-limit

**arp-guard rate-limit** *pps* {**per-src-ip** | **per-src-mac** | **per-port**}

*pps**per-src-ip* IP*per-src-mac* MAC*per-port*

|    |     |   |
|----|-----|---|
| IP | MAC | 4 |
|    | 100 |   |

```
Ruijie(config)# arp-guard rate-limit 2 per-src-ip  
Ruijie(config)# arp-guard rate-limit 3 per-src-mac  
Ruijie(config)# arp-guard rate-limit 50 per-port
```

|                                     |  |
|-------------------------------------|--|
|                                     |  |
| <b>show arp-guard configuration</b> |  |

### 56.1.5 arp-guard attack-threshold

**arp-guard attack-threshold**

User<IP=N/A,MAC=0000.0000.0004,port=Gi4/1,VLAN=1> is isolated.

T

RAP

Failed to isolate

user<IP=N/A,MAC=0000.0000.0004,port=Gi4/1,VLAN=1>.

1) 127

ARP

2) 1MB

%ARPGUARD-4-MEM\_LIMIT:user table's size reached limit 1MB.

3)

%ARPGUARD-4-ISOLATE\_FAILED:

failed to isolate ARP DoS attacker.

4)

%ARPGUARD-4-NO\_MEMORY: failed to alloc memory..

5) CPU

30

TRAP

Ruijie(config)# **arp-guard attack-threshold 2 per-src-ip**

Ruijie(config)# **arp-guard attack-threshold 3 per-src-mac**

Ruijie(config)# **arp-guard attack-threshold 50 per-port**

|                                     |  |
|-------------------------------------|--|
|                                     |  |
| <b>show arp-guard configuration</b> |  |
| <b>clear arp-guard users</b>        |  |
| <b>show arp-guard users</b>         |  |

## 56.1.6 arp-guard scan-threshold

**arp-guard scan-threshold pkt-cnt**

*pkt-cnt*



---

```
clear arp-guard users [vlan vid] [interface interface-id] [ip-address |  
mac-address]
```

*vid*

*interface-id*

*ip-address* IP

*mac-address* MAC

VLAN 1 g 0/1

```
Ruijie# clear arp-guard users vlan 1 interface g 0/1
```

|                                   |  |
|-----------------------------------|--|
|                                   |  |
| <b>arp-guard attack-threshold</b> |  |
| <b>show arp-guard users</b>       |  |

## 56.1.8 clear arp-guard scan

ARP

|                                 |     |
|---------------------------------|-----|
|                                 |     |
| <b>arp-guard scan-threshold</b> |     |
| <b>show arp-guard scan</b>      | ARP |

## 56.2

### 56.2.1 show arp-guard configuration

#### show arp-guard configuration

```
Ruijie# show arp-guard configuration
Rate limit: 10000 pps per-src-ip, 1 pps per-src-mac, 100
pps per-port
Attack threshold:10000 pps per-src-ip, 1 pps per-src-mac,
200 pps per-port
Scan threshold:15 packets per 10 seconds
Global isolate timeout:10800 seconds
Local isolate timeout(second):Gi4/1    permanent
```

|                                   |  |
|-----------------------------------|--|
|                                   |  |
| <b>arp-guard isolate timeout</b>  |  |
| <b>arp-guard rate-limit</b>       |  |
| <b>arp-guard attack-threshold</b> |  |
| <b>arp-guard scan-threshold</b>   |  |

## 56.2.2 show arp-guard users

```
show arp-guard users [statistics | [[vlan vid] [interface interface-id]  
[ip-address | mac-address]]]
```

*statistics*

*vid*

*interface-id*

*ip-address* IP

|                                   |  |
|-----------------------------------|--|
|                                   |  |
| <b>arp-guard attack-threshold</b> |  |
| <b>clear arp-guard users</b>      |  |

### 56.2.3 show arp-guard scan

ARP

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

*statistics*      ARP

*vid*

*interface-id*

*mac-address*

İ – DAÈ â Đ

|                                 |     |
|---------------------------------|-----|
|                                 |     |
| <b>arp-guard scan-threshold</b> |     |
| <b>clear arp-guard scan</b>     | ARP |

# 57      ACL

| id       | IP     ACL: 1-99,1300-1999<br>IP     ACL: 100-199,2000-2699<br>MAC    ACL: 700-799<br>ACL: 2700-2899                                                                         |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| name     | ACL                                                                                                                                                                          |
| sn       | ACL     (                    )                                                                                                                                               |
| start-sn |                                                                                                                                                                              |
| inc-sn   |                                                                                                                                                                              |
| deny     |                                                                                                                                                                              |
| permit   |                                                                                                                                                                              |
| prot     | IPv6                    ipv6,<br>icmp, tcp,udp        0-255        IPv4<br>eigrp, gre, ipinip, igmp, nos,<br>ospf, icmp, udp, tcp, ip<br>IP            0-255<br>icmp/tcp/udp |

|                        |                                             |
|------------------------|---------------------------------------------|
| fragment               |                                             |
| precedence precedence  | 0-7                                         |
| 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-<br>gt- neq- range-<br>port |
| src-mac-addr           |                                             |
| dst-mac-addr           |                                             |
| VID vid                | vlan id                                     |
| VID inner vid          | tag vid                                     |
| ethernet-type          | 0x                                          |
| match-all tcpf         | tcp flag                                    |
| text                   |                                             |
| in                     |                                             |
| out                    |                                             |
| {rule mask offset}+    | rule mask<br>offset<br>“+”                  |

AA AA AA AA AA AA BB BB BB BB BB BB CC CC DD DD  
 DD DD EE FF GG HH HH HH II II JJ KK LL LL MM MM  
 NN NN OO PP QQ QQ RR RR RR RR SS SS SS SS TT TT  
 UU UU VV VV VV VV WW WW WW WW XY ZZ aa aa bb bb

|   |     |   |   |     |    |
|---|-----|---|---|-----|----|
|   |     |   |   |     |    |
| A | MAC | 0 | O | TTL | 34 |
| B | MAC | 6 | P |     | 35 |

---

|   |            |    |    |              |    |
|---|------------|----|----|--------------|----|
| C |            | 12 | Q  | IP           | 36 |
| D | VLAN tag   | 14 | R  | ip           | 38 |
| E | DSAP(<br>) | 18 | S  | ip           | 42 |
| F | SSAP(<br>) | 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 |    |              |    |

- ' **ip access-group**
- ' **mac access-group**
- ' **expert access-group**
- ' **ipv6 traffic-filter**

### **57.1.1 access-list**

**no**

1) IP                    1 - 99   1300 - 1999

**access-list *id* {deny**

*destination-mac-address* | **any**} [**precedence** *precedence*] [**tos** *tos*]  
**[fragments]** [**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**] [**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**] [**time-range**  
*time-range-name*]

5)

**access-list** *list-remark text*

|             |           |         |           |           |
|-------------|-----------|---------|-----------|-----------|
| <i>id</i>   | 1-99      | 100-199 | 1300-1999 | 2000-2699 |
| 2700 – 2899 | 700 - 799 |         |           |           |
| <b>Deny</b> |           |         |           | ACE       |

*Destination*

*destination-wildcard*

- ' **urg**
- ' **ack**
- ' **psh**
- ' **rst**
- ' **syn**
- ' **fin**

- ' **critical**
- ' **flash**
- ' **flash-override**
- ' **immediate**
- ' **internet**
- ' **network**
- ' **priority**
- ' **routine**

- ' **max-reliability**
- ' **max-throughput**
- ' **min-delay**
- ' **min-monetary-cost**
- ' **normal**

#### ICMP

- ' **administratively-prohibited**
- ' **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**  
' **xmcp**

Ethernet-type

```
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 1
Ruijie(config)# access-list 702 deny host 00d0f8000c0c
any aarp
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# mac access-group 702 in
```

4) Expert

```

Expert Extended ACL ACL
IP 192.168.12.3 MAC 00d0.f800.0044
TCP
Ruijie(config)# access-list 2702 deny tcp host
192.168.12.3 mac 00d0.f800.0044 any any
Ruijie(config)# access-list 2702 permit any any any any
Ruijie(config)# show access-lists
expert access-list extended 2702
10 deny tcp host 192.168.12.3 mac 00d0.f800.0044 any
any
10 permit any any any any
```

|                          |     |
|--------------------------|-----|
|                          |     |
| <b>show access-lists</b> |     |
| <b>mac access-group</b>  | MAC |

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### 57.1.2 ip access-list

```

no IP ACL IP ACL
ACL
```

**ip access-list {extended | standard} {id | name}**  
**no ip access-list {extended | standard} {id | name}**

*id* IP 1-99 1300-1999 100-199  
 2000-2699  
*name* IP

ACL deny permit ACL  
**access-lists** ACL **show ip**

ACL

```
Ruijie(config)# ip access-list extended 123
Ruijie(config-ext-nacl)# show ip access-lists
ip access-list extended 123
Ruijie(config-ext-nacl)#
```

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)#
```

|                             |    |
|-----------------------------|----|
|                             |    |
| <b>show ip access-lists</b> | IP |

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### 57.1.3 MAC access-list

MAC ACL **no**  
 ACL

**mac access-list extended** {id | name}  
**no mac access-list extended** {id | name}

Id MAC 700-799  
 Name MAC

**show mac access-lists** ACL

MAC ACL

```
Ruijie(config)# mac access-list extended mac-acl
Ruijie(config-mac-nacl)# show mac access-lists
mac access-list extended mac-acl
Ruijie(config-mac-nacl)#
```

MAC ACL

```
Ruijie(config)# mac access-list extended 704
Ruijie(config-mac-nacl)# show mac access-lists
mac access-list extended 704
Ruijie(config-mac-nacl)#
```

|                              |     |
|------------------------------|-----|
|                              |     |
| <b>show mac access-lists</b> | mac |

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### 57.1.4 expert access-list

ACL ACL **no**  
 ACL

**expert access-list extended** {id | name}  
**no expert access-list extended** {id | name}

*Id* Expert 2700-2899  
*Name* ACL

**show expert access-lists** ACL

ACL

```
Ruijie(config)# expert access-list extended exp-acl
Ruijie(config-exp-nacl)# show expert access-lists
expert access-list extended exp-acl
Ruijie(config-exp-nacl)#
```

ACL

```
Ruijie(config)# expert access-list extended 2704
Ruijie(config-exp-nacl)# show expert access-lists
expert access-list extended 2704
Ruijie(config-exp-nacl)#
```

|                                 |  |
|---------------------------------|--|
|                                 |  |
| <b>show expert access-lists</b> |  |

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### 57.1.5 ipv6 access-list

IPV6 ACL **no**  
 ACL

**ipv6 access-list** name  
**no ipv6 access-list** name

Name ACL

**show access-lists** ACL

IPV6 ACL

```
Ruijie(config)# ipv6 access-list v6-acl
Ruijie(config-ipv6-nacl)# show access-lists
ipv6 access-list v6-acl
Ruijie(config-ipv6-nacl)#
```

|                          |      |
|--------------------------|------|
|                          |      |
| <b>show access-lists</b> | IPV6 |

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### 57.1.6 ip access-list resequence

ip ACL IPV6 ACL  
no

**ip access-list resequence** {*id* | *name*} **start-sn inc-sn**  
**no ip access-list resequence** {*id* | *name*}

*id* ACL

*Name* ACL

*start-sn*

**show access-lists**

ACL

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
Ruijie#
```

|                          |  |
|--------------------------|--|
|                          |  |
| <b>show access-lists</b> |  |

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**57.1.7 deny**

ACL05BÄ 0 wy

---

```
[sn] deny 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] deny tcp {source source-wildcard | host source | any} [operator
port [port]] {destination destination-wildcard | host destination | any}
[operator port [port]] [precedence precedence] [tos tos] [fragments]
[time-range time-range-name] [match-all tcp-flag]
```

#### User Datagram Protocol (UDP)

```
[sn] deny udp {source source-wildcard | host source | any} [operator
port [port]] {destination destination-wildcard | host destination | any}
[operator port [port]] [precedence precedence] [tos tos] [fragments]
[time-range time-range-name] [match-all udp-flag]
```



```

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] [time-range time-range-name]

```

**access-list**

```

Sn   ACL
source-ipv6-prefix   IPv6
destination-ipv6-prefix   IPv6
prefix-length
source-ipv6-address   IPv6
destination-ipv6-address   IPv6
dscp
dscp                   0-63.
flow-label
flow-label             0-1048575.
protocol               IPV6           IPV6 | icmp | tcp | udp  <0-255>

```

ACL

```

ACL           ACL

```

```

IP           192.168.4.12   Expert Extended ACL   ACL
MAC         001300498272
TCP

```

```

Ruijie(config)# expert access-list extended 2702
Ruijie(config-exp-nacl)# deny tcp host
192.168.4.12 host 0013.0049.8272 any any
Ruijie(config-exp-nacl)# permit any any any any
Ruijie(config-exp-nacl)# show access-lists
expert access-list extended 2702
10 deny tcp host 192.168.4.12 host 0013.0049.8272 any
any
20 permit any any any any
Ruijie(config-exp-nacl)#

```

|     |     |    |              |
|-----|-----|----|--------------|
| IP  | ACL | IP | 192.168.4.12 |
| TCP | 100 | 1  |              |

```
Ruijie(config)# ip access-list extended ip-ext-acl
Ruijie(config-ext-nacl)# deny tcp host 192.168.4.12 eq
100 any
Ruijie(config-ext-nacl)# show access-lists
ip access-list extended ip-ext-acl
10 deny 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 ip-ext-acl in
Ruijie(config-if)#
```

|     |     |     |                |
|-----|-----|-----|----------------|
| MAC | ACL | MAC | 0013.0049.8272 |
|     | 100 | 1   |                |

```
Ruijie(config)# mac access-list extended mac1
Ruijie(config-mac-nacl)# deny host 0013.0049.8272 any
arp
Ruijie(config-mac-nacl)# show access-lists
mac access-list extended mac1
10 deny host 0013.0049.8272 any arp
Ruijie(config-mac-nacl)# exit
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# mac access-group mac1 in
```

|    |     |    |              |
|----|-----|----|--------------|
| IP | ACL | IP | 192.168.4.12 |
|    | 1   |    |              |

```
Ruijie(config)#
```

```
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# ipv6 traffic-filter v6-acl in
```

| <b>show access-lists</b>   |         |
|----------------------------|---------|
| <b>ipv6 traffic-filter</b> | IPV6    |
| <b>ip access-group</b>     | IP ACL  |
| <b>mac access-group</b>    | MAC ACL |
| <b>ip access-list</b>      | IP ACL  |

[ *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**] [**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*]] [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**time-range** *time-range-name*]

### 3) MAC

[*sn*] **permit** {**any** | **host** *source-mac-address*} {**any** | **host** *destination-mac-address*} [*ethernet-type*][ **cos** [*out*] [*inner in*]]

### 4) Expert

[*sn*] **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**] [**time-range** *time-range-name*]

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**}

*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*}

*destination-ipv6-address* | **any** } [*operator* **port** [**port**]] [**dscp**

```
Ruijie(config)# mac access-list extended 702
Ruijie(config-mac-nacl)# permit host 0013.0049.8272
any aarp
Ruijie(config-mac-nacl)# show access-lists
mac access-list extended
10 permit host 0013.0049.8272 any aarp702
Ruijie(config-mac-nacl)# exit
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# mac access-group 702 in
```

```
ip      ACL      IP
```

access-list

ACL

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

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### 57.1.10 remark

ACL      ACE                      **no**

**remark** *text*

*Text*

ACL

ACL

```
Ruijie# ip access-list extended 102
Ruijie(config-ext-nacl)# remark first_remark
Ruijie(config-ext-nacl)# permit tcp 1.1.1.1 0.0.0.0
2.2.2.2 0.0.0.0
Ruijie(config-ext-nacl)# remark second_remark
Ruijie(config-ext-nacl)# permit tcp 3.3.3.3 0.0.0.0
4.4.4.4 0.0.0.0
Ruijie(config-ext-nacl)# end
```

```
Ruijie# configure terminal
Ruijie(config)# access-list 80 remark test_remark
```

|                          |  |
|--------------------------|--|
|                          |  |
| <b>show access-lists</b> |  |

**57.1.11 no sn**

ACL

**no sn****sn ACL**

ACL

ACL

ACL

```

Ruijie(config)# ipv6 access-list extended v6-acl
Ruijie(config-ipv6-nacl)# permit ipv6
host ::192.168.4.12 any
Ruijie(config-ipv6-nacl)# 12 deny ipv6 host any any
Ruijie(config-ipv6-nacl)# show access-lists
ipv6 access-list extended v6-acl
10 permit ipv6 host ::192.168.4.12 any
12 deny ipv6 any any
Ruijie(config-ipv6-nacl)# no 12
Ruijie(config-ipv6-nacl)# show access-lists
ipv6 access-list extended v6-acl
10 permit ipv6 host ::192.168.4.12 any
Ruijie(config-ipv6-nacl)#

```

|                          |          |
|--------------------------|----------|
|                          |          |
| <b>show access-lists</b> |          |
| <b>ip access-list</b>    | ip ACL   |
| <b>ipv6 access-list</b>  | IPV6 ACL |
| <b>deny</b>              | ACL      |
| <b>permit</b>            | ACL      |

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### 57.1.12 ip access-group

ip

```

access-group          no
ip access-group {id | name} {in | out}
no ip access-group { id | name} {in | out}
    
```

```

id   IP                1-199  1300-2699
name IP
in
out
    
```

#### ip access-group

```

fastEthernet0/0      120
    
```

```

Ruijie(config)# interface fastEthernet 0/0
Ruijie(config-if)#ip access-group 120 in
    
```

|                            |                                   |
|----------------------------|-----------------------------------|
|                            |                                   |
| <b>access-list</b>         |                                   |
| <b>show access-lists</b>   |                                   |
| <b>show ip access-list</b> | IP 1-199 1300 –<br>2699 3000 3199 |

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### 57.1.13 MAC access-group

MAC ACL

no

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

*id* MAC 700-799  
*name* MAC  
**in**  
**out**

ACL

**show running-config**

1 access-list accept\_00d0f8xxxxxx\_only Gigabit

```
Ruijie(config)# interface GigaEthernet 1/1
Ruijie(config-if)# mac access-group
accept_00d0f8xxxxxx_only in
```

|                          |     |
|--------------------------|-----|
|                          |     |
| <b>show access-group</b> | ACL |

RGOS10.0

### 57.1.14 expert access-group

EXPERT ACL

no

**expert access-group** {id | name} {in | out}  
**no expert access-group** {id | name} {in | out}

```

id Expert 2700-2899
name Expert
in
out

```

ACL  
**show access-group**

```

1 access-list accept_00d0f8xxxxxx_only Gigabit
Ruijie(config)# interface GigaEthernet 0/1
Ruijie(config-if)# expert access-group
accept_00d0f8xxxxxx_only in

```

|                          |     |
|--------------------------|-----|
|                          |     |
| <b>show access-group</b> | ACL |

RGOS10.0

### 57.1.15 ipv6 traffic-filter

IPV6 ACL no

```

ipv6 traffic-filter name {in | out}
no ipv6 traffic-filter name {in | out}

```

```

name IPV6
in
out

```

ACL  
**show ipv6 traffic-filter**

```

access-list v6-acl Gigabit 1
Ruijie(config)# interface GigaEthernet 0/1
Ruijie(config-if)# ipv6 traffic-filter v6-acl in
    
```

|                          |     |
|--------------------------|-----|
|                          |     |
| <b>show access-group</b> | ACL |

RGOS10.0

## 57.2

```

:
' show access-lists
' show ip access-group
' show expert access-group
' show mac access-group
' show ipv6 traffic-filter
' show access-group
    
```

### 57.2.1 show access-lists

```

ACL ACL
show access-lists [id | name]

id
    
```

*name*

acl                    *id*   *name*                    ACL

```
Ruijie# show access-lists n_acl
ip access-list standard n_acl
Ruijie# show access-lists 102
ip access-list extended 102
Ruijie# show access-lists
ip access-list standard n_acl
ip access-list extended 101
mac access-list extended mac-acl
expert access-list extended exp-acl
ipv6 access-list extended v6-acl
```

|                           |               |
|---------------------------|---------------|
|                           |               |
| <b>ip access-list</b>     | IP ACL        |
| <b>mac access-list</b>    | MAC      ACL  |
| <b>expert access-list</b> | Expert    ACL |
| <b>ipv6 access-list</b>   | IPv6      ACL |

RGOS10.0

## 57.2.2 show ip access-group

IP ACL

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

<interface>

ACL

```
Ruijie# show ip access-group interface gigabitethernet  
0/1  
ip access-group aaa in  
Applied On interface GigabitEthernet 0/1.
```

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

RGOS10.0

### 57.2.3 show expert access-group

Expert

RGOS10.0

---

RGOS10.0

## 57.2.4 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
mac access-group mm in
Applied On interface GigabitEthernet 0/3.
```

| mac access-list | MAC ACL |
|-----------------|---------|

RGOS10.0

## 57.2.5 show ipv6 traffic-filter

IPV6

**show ipv6 traffic-filter** [interface <interface>]

<interface>

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 |

RGOS10.0

## 57.2.6 show access-group

ACL

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

<interface>

ACL

ACL

```
Ruijie# show access-group
ip access-list standard ipstd3
Applied On interface GigabitEthernet 0/1.
ip access-list standard ipstd4
Applied On interface GigabitEthernet 0/2.
ip access-list extended 101
Applied On interface GigabitEthernet 0/3.
ip access-list extended 102
Applied On interface GigabitEthernet 0/8.
```

| <b>ip access-group</b>     | ip     |
|----------------------------|--------|
| <b>mac access-group</b>    | MAC    |
| <b>expert access-group</b> | Expert |
| <b>ipv6 traffic-filter</b> | IPV6   |

RGOS10.0

## 57.3

' **security global access-group**

' **security access-group**

' **security uplink enable**

### 57.3.1 security global access-group

**security global access-group** {*id*|*name*}

**no security global access-group**

*id*           ACL id

*name*         ACL

```
Ruijie(config)#security global access-group 1
```

---

|                      |  |
|----------------------|--|
|                      |  |
| <b>show secu-acl</b> |  |

RGOS10.2

### 57.3.2 security access-group

**security access-group** {*id*|*name*}

**no security access-group**

*id* ACL id

*name* ACL

Ruijie(config-if)#**security access-group 1**

|                      |  |
|----------------------|--|
|                      |  |
| <b>show secu-acl</b> |  |

RGOS10.2

### 57.3.3 security uplink enable

**security uplink enable**

**no security uplink enable**

```
Ruijie(config-if)#security uplink enable
```

|                      |  |
|----------------------|--|
|                      |  |
| <b>show secu-acl</b> |  |

RGOS10.2

# 58 VACL

## 58.1

```

Vlan access map                               map_name
  map_sn                                       map
      map
'
      vlan access map                           map
  map_sn                                       map      map      map
  map_sn      10
'
      map_sn      vlan access map      map_name
  Map_name      map
'
      map_sn      vlan access map
  map      map      map      map      map
'
      map      6553      map

```

### 58.1.1 vlan access-map

```

      map                                       map
no
vlan access-map map_name [ map_sn ]
no vlan access-map map_name [ map_sn ]

map_name      map      100
map_sn      map      [0 - 65535]

```

#### vlan access map

```

Ruijie(config)# vlan access-map ddd 20
Ruijie(config-access-map)#

```

## 58.1.2 match ip/mac address

```

      ip acl      mac acl      vlan access map
ip acl      mac acl      vlan access map
      no

```

```

match ip address { acl_name | acl_id }+
no match ip address { acl_name | acl_id }+
match mac address { acl_name | acl_id }+
no match mac address { acl_name | acl_id }+

```

---

```

+          acl,          8  acl

```

---

```

acl_name      acl;
acl_id      numbered acl;

```

```

Config-access-map      vacl

```

---

/

- 1) map ip acl map acl
  - 2) map 8 acl
  - 3) map acl
  - 4) map ace acl acl
  - 5) map ip acl (mac acl) ip  
acl (mac acl) ip acl (mac acl) ip acl  
(mac acl)
  - 6) map ip acl (mac acl)  
mac acl (ip acl) ip acl (mac acl)  
mac acl (ip acl)
- 

```

map  match

```

```

Ruijie(config)# vlan access-map dd
Ruijie(config-access-map)# match ip address 10 20 sp1
30 sp2
Ruijie(config-access-map)# exit
Ruijie(config)# vlan access-map dd 20
Ruijie(config-access-map)# match mac address 710 720 m1
760
Ruijie(config-access-map)# exit
Ruijie(config)#

```

### 58.1.3 action forward/drop/redirect

```

          map  actions          vACL
no          map          actions          forward

action forward
no action forward

          map  actions          vACL
no          map          actions          forward

action drop
no action drop

          map  actions          vACL
no          map          actions          forward

action redirect { GigabitEthernet | Aggregateport } {port_id}
no action redirect { GigabitEthernet | Aggregateport } {port_id}

action forward
action drop
action redirect

          map          forward          map

vACL

Ruijie(config-access-map)# action forward
Ruijie(config-access-map)# action drop
Ruijie(config-access-map)# action redirect
gigabitEthernet 0/50

```

## 58.1.4 vlan filter

```
map      vlan      map      vlan
        no
```

```
vlan filter map_name vlan-list vlan_id
no vlan filter map_name vlan-list vlan_id
```

```
map_name      map
```

```
vlan_id  vlan  id
```

```

Ruijie(config)# show vlan access-map
Vlan access-map aa 10
match mac address: 700, 710, m1, 720,
action: forward
Vlan access-map aa 20
match ip address: 10, 20, 30, sp1, sp2, 60, 50, 80,
action: drop
Vlan access-map dd 20
match mac address: 710, 720, m1, 760,
action: forward
Ruijie(config)#

```

#### **show vlan access map { map\_name }**

```

Ruijie(config)# show vlan access-map dd
Vlan access-map dd 20
match mac address: 710, 720, m1, 760,
action: forward
Ruijie(config)#

```

## 58.2.2 show vlan filter

map vlan

**show vlan filter**

| <b>Show vlan filter</b> <i>access-map</i><br><i>map_name</i> | map vlan |
|--------------------------------------------------------------|----------|

**show vlan filter vlan** *vlan*>015.874 1.446 Td<1DB9233-2.86 Tw 8.5836-1.44 0 371DB92

Configured on VLANs: 1, 5, 6,

Ruijie(config)#



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

DSCP to CoS

CoS

**mls qos cos** *default-cos*

**no mls qos cos**

*default-cos*      0 7

**no**

CoS      0

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

Ruijie(config-if)# **mls qos cos** 7

**show mls qos interface** *interface-id*

### 59.2.3 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*

**access-list** *acl-id*                      ACL

class map                      class map

**[no] class-map** *class-map-name*

class map

**[no] match access-group** *acl-name* | *acl-id*

*acl-name*                                  ACL

*acl-id*                                      ACL    id

*class-map-name*                          class map

**no class-map** *class-map-name* class map

**no match access-group** *acl-name*| *acl-id*

MAC ACL, me

Ruijie(config)# **mac access-list extended** me

ACL

Ruijie(config-ext-macl)# **permit host** 1111.2222.3333  
**any**

ACL

Ruijie(config-ext-macl)# **exit**

class-map, cm

Ruijie(config)# **class-map** cm

ACL

Ruijie(config-cmap)# **match access-group** me

class-map

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

**show mac access-lists**

**show ip access-lists**

**show class-map**

## 59.2.4 Policy Maps

policy map policymap

[no] **policy-map** *policy-map-name*

policy map class-map ,

[no] **class** *class-map-name*

IP ipdscp IP

**set ip dscp** *new-dscp*

**no set ip dscp**

**police** *rate-bps burst-byte*[**exceed-action** {**drop** | **dscp** *dscp-value*}]

**no police**

*policy-map-name*                      **policy-map**

**no policy-map** *policy-map-name*                      **policy map**

*class-map-name*                      **class map**

**no class** *class-map-name*

~~new- **police** *rate-bps burst-byOS* **exceed-action** {**drop** | **dscp** *dscp-value*} **drop** **drop**~~

**pol,icy map**

policy map

**service-policy** {input | output} *policy-map-name*

**no service-policy** {input | output}

*policy-map-name*                      policymap

**no**                      policy map

Ruijie(config)# **interface fastEthernet**

**show mls qos queueing**

## 59.2.7 priority-queue cos-map

CoS

**priority-queue cos-map** *qid cos0 [cos1 [cos2 [cos3 [cos4 [cos5 [cos6 [cos7]]]]]]]*

**no priority-queue cos-map**

*qid*                    *id*  
*cos0 ... cos7*            CoS  
*no*

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

**show mls qos queueing**

## 59.2.8 wrr-queue bandwidth

WRR

**wrr-queue bandwidth** *weight1 ... weightn*

**no wrr-queue bandwidth**

*weight1...weightn*            *n*                                    *n*

**no**

*weight1: ...: weightn = 1:...:1*

```
Ruijie(config)# wrr-queue bandwidth 1 2 3 4 5 6 7 8
```

```
show mls qos queueing
```

### 59.2.9 mls qos map cos-dscp

CoS                    DSCP

```
mls qos map cos-dscp dscp1...dscp8
```

```
no mls qos map cos-dscp
```

```
dscp
```

```
no
```

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

```
show mls qos maps        dscp-cos maps,dscp-cos maps  
ip-prec-dscp maps
```

### 59.2.10 mls qos map dscp-cos

DSCP                    CoS

```
mls qos map dscp-cos dscp-list to cos
```

```
no mls qos map dscp-cos
```

```
dscp-list
```

**cos**                    0 7  
**no**

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

**no mls qos scheduler**

**sp**

**rr**

**wrr**

**drr**

**no**

**wrr**

Ruijie(config)# **mls qos scheduler sp**

**show mls qos scheduler**

### 59.2.13 drr-queue bandwidth

**DRR**

**drr-queue bandwidth *weight1...weight8***

**no drr-queue bandwidth**

*weight1...weight8*

**no**

Ruijie(config)# **drr-queue bandwidth 1 2 3 4 5 6 7 8**

**show mls qos queueing**

## 59.2.14 mls qos map ip-prec-dscp

ippre                    DSCP

**mls qos map ip-prec-dscp dscp1...dscp8**

**no mls qos map ip-prec-dscp**

**dscp**

**no**

```
Ruijie(config)# mls qo map ip-prec -dscp 8 10 16 18 24  
26 32 34
```

**show mls qos maps**            dscp-cos maps,dscp-cos maps  
ip-prec-dscp maps

## wfq-queue bandwidth

wfq

**wfq-queue queue-id bandwidth min max**

**no wfq-queue queue-id bandwidth**

*queue-id*

*min*

*max*

min

kbps

max kbps

wfq

wfq

```
Ruijie(config)# mls qos scheduler wfq
Ruijie(config)# show mls qos scheduler
```

```
Ruijie(config-if)# wfq-queue 2 bandwidth 10 10240
Ruijie(config-if)# wfq-queue 4 bandwidth 7 10240
Ruijie(config-if)# show running
```

|                        |     |
|------------------------|-----|
|                        |     |
| show mls qos scheduler | QOS |

RGOS10.1

### wfq-queue sp

wfq

(sp)

```
wfq-queue queue-id sp
no wfq-queue queue-id sp
```

*queue-id*

*sp:*

sp

wfq

sp+wfq

wfq

```
Ruijie(config)# mls qos scheduler wfq
Ruijie(config)# show mls qos scheduler
```

1 3

```
Ruijie(config)# wfq-queue 1 sp
Ruijie(config)# wfq-queue 3 sp
Ruijie(config)# show running
```

|                        |     |
|------------------------|-----|
|                        |     |
| show mls qos scheduler | QOS |

RGOS10.1

## virtual-group

Aggregate Port

no

**virtual-group** *virtual-group-number*

**no virtual-group** *virtual-group-number*

|                             |     |
|-----------------------------|-----|
|                             |     |
| <i>virtual-group-number</i> | 128 |

Aggregate Port

---

24 48 24

1/3 3

```
Ruijie(config)# interface gigabitethernet 1/3
Ruijie(config-if)# virtual-group 3
```

|                    |  |
|--------------------|--|
|                    |  |
| show virtual-group |  |

RGOS10.1

## 59.3

•

### 59.3.1 show class-map

*policy-name*      policy name

*class-name*      class map

policy name

```
Ruijie# show policy-map
```

### 59.3.3 show mls qos interface

QoS

```
show mls qos interface interface-id [policers]
```

*interface-id*

**policers**                      police

QoS

```
Ruijie# show mls qos interface fastEthernet 0/1
```

### 59.3.4 show mls qos virtual-group

police

```
show mls qos virtual-group [virtual-group-number | policers]
```

*virtual-group-number*

**policers**                      police

police



**ip-prec-dscp**      ip-prec-dscp maps

dscp-cos maps    dscp-cos maps    ip-prec-dscp maps

Ruijie# **show mls qos maps**

S8600                    **cos-dscp dscp-cos ip-prec-dscp**

### 59.3.8 show mls qos rate-limit

**show mls qos rate-limit** [**interface** *interface-id*]

**interface**    interface-id    rate-limit

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

.14375 173.88 50509 /C2\_0 1summaryc 4.16 0 Td ( )

**rat 89.1 T**

```
Ruijie# show virtual-group 1
```

```
Ruijie# show virtual-group summary
```

# 60 WRED

## 60.1 WRED

| Queue1 | Threshold1 | CoS                       | 0       | 1 | 2        | 3 | 4 | 5 | 6 | 7 |  |
|--------|------------|---------------------------|---------|---|----------|---|---|---|---|---|--|
|        |            | WRED-drop                 | 100%low |   | 100%high |   |   |   |   |   |  |
|        |            | random-detectprobability  | 100%    |   |          |   |   |   |   |   |  |
|        | Threshold2 | CoS                       | NONE    |   |          |   |   |   |   |   |  |
|        |            | WRED-drop                 | 80% low |   | 100%high |   |   |   |   |   |  |
|        |            | random-detectprobability  | 80%     |   |          |   |   |   |   |   |  |
|        | Threshold3 | CoS                       | S86     |   |          |   |   |   |   |   |  |
|        |            | WRED-drop                 | S86     |   |          |   |   |   |   |   |  |
|        |            | random-detectprobability  | S86     |   |          |   |   |   |   |   |  |
| Queue2 | Threshold1 | CoS                       | S86     |   |          |   |   |   |   |   |  |
|        |            | WRED-drop                 | S86     |   |          |   |   |   |   |   |  |
|        |            | random-detectprobability  | S86     |   |          |   |   |   |   |   |  |
|        | Threshold2 | CoS                       | S86     |   |          |   |   |   |   |   |  |
|        |            | WRED-drop                 | S86     |   |          |   |   |   |   |   |  |
|        |            | random-detectprobability  | S86     |   |          |   |   |   |   |   |  |
|        | Threshold3 | CoS                       | S86     |   |          |   |   |   |   |   |  |
|        |            | WRED-drop                 | S86     |   |          |   |   |   |   |   |  |
|        |            | random-detect probability | S86     |   |          |   |   |   |   |   |  |

/



no

**wrr-queue random-detect min-threshold** *queue\_id* *thr1* [*thr2* *thr3*]

**no wrr-queue random-detect min-threshold** *queue\_id*

|                 |  |
|-----------------|--|
|                 |  |
| <i>queue_id</i> |  |
| <i>thr1</i>     |  |
| <i>thr2</i>     |  |
| <i>thr3</i>     |  |

WRED

WRED

WRED

WRED

S86

S86 2

1

Ruijie(config-if)# **wrr-queue random-detect min-threshold** 1 68 69 70

|   |   |
|---|---|
|   |   |
| - | - |

|   |   |
|---|---|
|   |   |
| - | - |

### 60.2.3 wrr-queue random-detect probability

no

**wrr-queue random-detect min-threshold** *queue\_id* *prob1* [*prob2* *prob3*]

**no wrr-queue random-detect min-threshold** *queue\_id*

|                 |     |
|-----------------|-----|
|                 |     |
| <i>queue_id</i> |     |
| <i>prob1</i>    |     |
| <i>prob2</i>    |     |
| <i>prob3</i>    | S86 |

WRED  
WRED

WRED

WRED

S86

S86                    2

1

ĐỀ à p àĐ

Ruijie(config-if)#**wrr-queue random-detect probability** 1 61 62 63

|  |   |
|--|---|
|  | Đ |
|--|---|

WRED

|                  |                            |
|------------------|----------------------------|
| <i>queue_id</i>  |                            |
| <i>cos_value</i> | cos      1      8      0~7 |

cos

DSCP-CoS    CoS-threshold

DSCP    threshold

CoS            threshold

WRED

RED

cos      1    6

cos

priority-queue cos-map

Ruijie(config-if)#wrr-queue cos-map 2 1 6

|   |   |
|---|---|
|   |   |
| - | - |

show queueing wred interface g0/1

```

-----
qid max_1 min_1 prob_1 max_2 min_2 prob_2 max_3 min_3 prob_3
-----
1 0 0 90 0 0 91 0 0 92
2 88 66 90 87 55 91 86 66 92
3 0 0 0 0 0 0 0 0 0
4 0 0 0 0 0 0 0 0 0
5 88 66 0 89 67 0 90 68 0
6 0 0 0 0 0 0 0 0 0
7 0 0 0 0 0 0 0 0 0
8 0 0 0 0 0 0 0 0 0

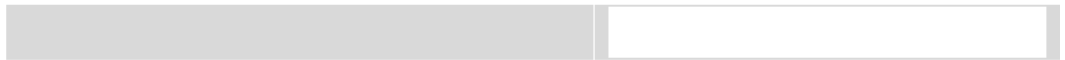
```

cos qid threshold\_id

```

--- --- -----
0 1 1
1 2 1
2 3 1
3 4 2
4 5 1
5 6 3
6 7 2
7 8 1

```





```
vrrp 1 authentication x30dn78k
```



```
Ruijie(config-if)# vrrp group ip  
ipaddress [ secondary ]
```



Ruijie(config-if)# **vrrp group ip**

```

VRRP
VRRP IP IP no
group ip ipaddress [secondary]
rp group ip ipaddress [secondary]

VRRP
ress IP
ndary IP
VRRP

secondary IP IP IP no
VRRP IP IP
IP IP

0 VRRP VRRP
IP 10.0.1.20 IP 10.0.2.20

interface FastEthernet 0/0
switchport
address 10.0.1.1 255.255.255.0
address 10.0.2.1 255.255.255.0 secondary
1 ip 10.0.1.20
1 ip 10.0.2.20 secondary

```

**vrrp group preempt [delay seconds]**

**no vrrp group preempt [delay]**

*group* VRRP

**delay** *seconds* Master

0

VRRP

VRRP

VRRP

VRRP

Master

VRRP

VRRP

Master

VRRP

VRRP

IP

VRRP

VRRP

VRRP

(200)

15

vrrp 1 preempt delay 15

vrrp 1 priority 200

| Ruijie(config-if)# <b>vrrp group ip</b><br><i>ipaddress [ secondary ]</i> | VRRP<br>IP |
|---------------------------------------------------------------------------|------------|
| Ruijie(config-if)# <b>vrrp group priority</b><br><i>level</i>             | VRRP       |

### 61.1.6 vrrp priority

VRRP

**no**

**vrrp group priority level**

**no vrrp group priority**

*group* VRRP

*level* VRRP

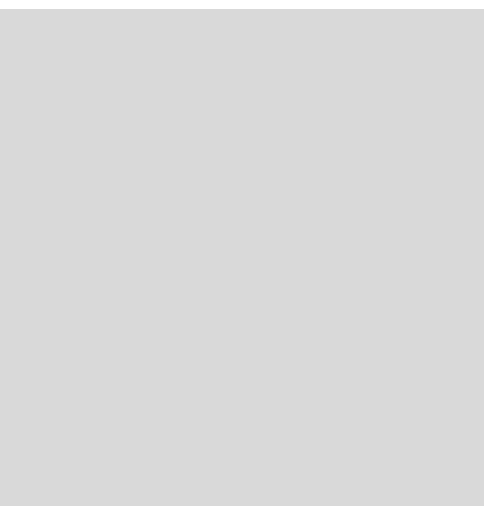
VRRP 100 VRRP VRRP

VRRP

VRRP 1 254

vrrp 1 priority 254

WçTİRđ đ \$€g% c SM°NÂ TÔĐ đ ÔPa -Òđ4Ã • Á À / ê F0E1 Rñĭ• ÊÝ^DAFd ~Íj ' (



VRRP  
VRRP

VRRP

VRRP 4

vrrp 1 timers advertise 4

|                                                                           |            |
|---------------------------------------------------------------------------|------------|
|                                                                           |            |
| Ruijie(config-if)# <b>vrrp group ip</b><br><i>ipaddress [ secondary ]</i> | VRRP<br>IP |
| Ruijie(config-if)# <b>vrrp group timers learn</b>                         |            |

### 61.1.8 vrrp timers learn

no

**vrrp group timers learn**  
**no vrrp group timers learn**

*group* VRRP

VRRP

VRRP

VRRP

VRRP

VRRP

Master

VRRP

Master

VRRP

VRRP 1

vrrp 1 timers learn

|                                                                                 |            |
|---------------------------------------------------------------------------------|------------|
|                                                                                 |            |
| Ruijie(config-if)# <b>vrrp group ip</b><br><i>ipaddress [secondary]</i>         | VRRP<br>IP |
| Ruijie(config-if)# <b>vrrp group timers</b><br><b>advertise [msec] interval</b> | VRRP       |

## 61.1.9 vrrp track

```

VRRP          vrrp group track interface-type number
              VRRP IP          vrrp group track ip-address
              vrrp group track bfd      BFD          IP      no

```

```

vrrp group track [interface-type number] bfd interface-type
interface-number ipv4-address [priority]

```

```

vrrp group track ip-address [[[ interval interval-value ]
timeout timeout-value ] priority ]

```

```

vrrp group track [interface-type number] bfd interface-type
interface-number ipv4-address | ip-address]

```

```

group      VRRP

```

```

interface-type

```

```

number

```

```

ipv4-address      IPv4      bfd

```

```

interval-value

```

```

3

```

```

timeout-value

```

```

1

```

```

priority

```

```

10

```

```

VRRP

```

```

VRRP

```

```

VRRP

```

```

IP

```

( Routed Port SVI Loopback Tunnel )  
IP ping

VRRP(1)

VRRP(1)

---

```
' debug vrrp events
' debug vrrp packets
' debug vrrp state
```

### 61.2.1 debug vrrp

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

VRRP

```
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# <b>debug vrrp errors</b> | VRRP |
| Ruijie# <b>debug vrrp events</b> | VRRP |
| Ruijie# <b>debug vrrp state</b>  | VRRP |

### 61.2.2 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
```

### 61.2.3 debug vrrp events

VRRP                      no

**debug vrrp events**  
**no debug vrrp events**

VRRP

VRRP

```
Ruijie# debug vrrp events
VRRP: Grp 1 Event - Advert higher or equal priority
VRRP: Grp 1 Event - Advert higher or equal priority
VRRP: Grp 1 Event - Advert higher or equal priority
```

### 61.2.4 debug vrrp packets

VRRP                      no

**debug vrrp packets**  
**no debug vrrp packets**

VRRP

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

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

## 61.2.5 debug vrrp state

VRRP

no

**debug vrrp state**

**no debug vrrp state**

VRRP

VRRP

```
Ruijie# debug vrrp state
Ruijie#
%VRRP-6-STATECHANGE: FastEthernet 0/0 Grp 2 state Master
-> Backup
%VRRP-6-STATECHANGE: FastEthernet 0/0 Grp 2 state Backup
-> Master

Ruijie# config terminal
Enter configuration commands, one per line. End with
CNTL/Z.

Ruijie(config)# interface fastethernet 0/0
Ruijie(config-if)# no shutdown
Ruijie(config-if)# end
Ruijie#
%VRRP-6-STATECHANGE: FastEthernet 0/0 Grp 2 state Master
-> Init
```

## 61.3

### 61.3.1 show vrrp

#### VRRP

```
show vrrp [ brief | group ]
```

```
brief                VRRP
group                VRRP
```

#### VRRP

#### 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
```



## E1/0 VRRP

```

Ruijie# show vrrp interface fastethernet 0/0
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

```

| Ruijie(config-if)# vrrp group ip<br>ip address [ <b>secondary</b> ] | VRRP<br>IP |
|---------------------------------------------------------------------|------------|

## 62 BFD

### 62.1

#### 62.1.1 bfd

|            | <b>bfd</b> | <b>BFD</b> | <b>no</b> |
|------------|------------|------------|-----------|
| <b>BFD</b> |            |            |           |

**bfd interval** *milliseconds* **min\_rx** *milliseconds* **multiplier** *multiplier-value*

**no bfd interval** *milliseconds* **min\_rx** *milliseconds* **multiplier** *multiplier-value*

|                                     | 6 8      |          | 6 8      |          |          |          |
|-------------------------------------|----------|----------|----------|----------|----------|----------|
| <b>Interval</b> <i>milliseconds</i> | <i>a</i> | <i>l</i> | <i>!</i> | <i>4</i> | <i>/</i> | <i>l</i> |

```
Ruijie(config-if)# bfd interval 100 min_rx 100 multiplier 3
```

|                           |          |
|---------------------------|----------|
|                           |          |
| <b>bfd all-interfaces</b> | BFD      |
| <b>clear bfd</b>          | BFD      |
| <b>ip ospf bfd</b>        | OSPF BFD |
| <b>ip rip bfd</b>         | RIP BFD  |

### 62.1.2 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
                                ip ospf bfd [disable] ip rip bfd [disable]
                                OSPF RIP BFD
                                OSPF RIP BFD

```

```
# OSPF BFD
Ruijie(config)# router ospf 123
Ruijie(config-router)# bfd all-interface
```

|                    |          |
|--------------------|----------|
|                    |          |
| <b>bfd</b>         | BFD      |
| <b>ip ospf bfd</b> | OSPF BFD |
| <b>ip rip bfd</b>  | RIP BFD  |

### 62.1.3 bfd cpp

```
bfd cpp BFD no BFD
```

```
bfd cpp
no bfd cpp
```

|   |   |
|---|---|
|   |   |
| - | - |

BFD

BFD

BFD  
BFD

BFD  
BFD

BFD

BFD

```
# BFD
Ruijie(config)# bfd cpp
```

|   |   |
|---|---|
|   |   |
| - | - |

### 62.1.4 bfd echo

bfd echo                      echo                      no                      echo

```
bfd echo
no bfd echo
```

|   |   |
|---|---|
|   |   |
| - | - |

BFD                      echo

BFD                      echo                      echo  
**Interval milliseconds**      **min\_rx milliseconds**

---

|                                              |
|----------------------------------------------|
| L3 AP                                        |
| BFD      ECHO      ,      BFD <b>no ip</b>   |
| <b>redirects</b> ICMP <b>no ip deny land</b> |
| DDOS      (      Land-based      )           |
| Echo                      BFD                |

---

```
# Routed Port      FastEthernet 0/2      echo
Ruijie(config)# interface fastEthernet 0/2
```

```
Ruijie(config)# no switchport
```

```
Ruijie(config-if)# bfd echo
```

|                       |            |
|-----------------------|------------|
|                       |            |
| <b>bfd</b>            | BFD        |
| <b>ip redirects</b>   | ICMP       |
| <b>ip deny land</b>   | Land-based |
| <b>bfd slow-timer</b> |            |

### 62.1.5 bfd slow-timer

```
bfd slow-timer  
BFD
```

```
BFD  
BFD
```

```
ECHO  
"
```

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

| <b>bfd echo</b> | BFD Echo |
|-----------------|----------|

## 62.1.6 bfd up-dampening

```
                ž                UP        ID  
bc  
bfd up-dampening [milliseconds]  
no bfd up-dampening
```

┌

┌

|         |  |
|---------|--|
|         |  |
| 10.3(5) |  |

### 62.1.7 ip ospf bfd

```

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

|         |               |
|---------|---------------|
|         |               |
| disable | fl t OSPF 6:8 |

```

X]gW Y          OSPF      6:8
    
```

```

        OSPF      BFD
        OSPF      [no] bfd all-interfaces
        BFD
        ip ospf bfd [disable]
    OSPF      BFD
    
```

```

# Routed Port    FastEthernet 0/2    OSPF      BFD
Ruijie(config)# interface FastEthernet 0/2
Ruijie(config-if)# no switchport
Ruijie(config-if)# ip ospf bfd disable
    
```

|                           |     |
|---------------------------|-----|
|                           |     |
| <b>bfd</b>                | BFD |
| <b>bfd all-interfaces</b> | BFD |

### 62.1.8 ip rip bfd

```

        ip rip bfd          RIP      BFD
    disable                no
    ip rip bfd [disable]
    no ip rip bfd
    
```

|                |              |
|----------------|--------------|
|                |              |
| <b>disable</b> | fl t FID 6 8 |

```

X]gUW Y          RIP      6 8
    
```

```

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

```

# Routed Port      FastEthernet 0/2          RIP      BFD
Ruijie(config)# interface FastEthernet 0/2
Ruijie(config-if)# no switchport
Ruijie(config-if)# ip rip bfd disable
    
```



```

Ruijie(config-if)# ip address 172.16.0.1 255.255.255.0
Ruijie(config-if)# bfd interval 50 min_rx 50 multiplier 3
Ruijie(config-if)# ip route static bfd FastEthernet 0/1 172.16.0.2

Ruijie(config-if)# ip route 10.0.0.0 255.0.0.0 FastEthernet
0/1 172.16.0.2

```

|            |     |
|------------|-----|
|            |     |
| <b>bfd</b> | BFD |

### 62.1.10 neighbor fall-over bfd

```

router address-family , neighbor fall-over BGP
BFD BGP , no

```

**neighbor ip-address fall-over bfd**

**no neighbor ip-address fall-over bfd**

|                   |     |
|-------------------|-----|
|                   |     |
| <i>ip-address</i> | BGP |

6 D 6 8

1 D 6 8

```

# BGP BFD BFD 172.16.0.2
Ruijie(config)# router bgp 44000
Ruijie(config-router)# bgp log-neighbors-changes
Ruijie(config-router)# neighbor 172.16.0.2 remote-as 45000

```

```
Ruijie(config-router)# neighbor 172.16.0.2 fall-over bfd
Ruijie(config-router)# end
```

|            |     |
|------------|-----|
|            |     |
| <b>bfd</b> | BFD |

### 62.1.11 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*]]

|                                                     |                                     |
|-----------------------------------------------------|-------------------------------------|
|                                                     |                                     |
| <i>j fZ j fZ! bUaY</i>                              | fl  Ț          JF:                  |
| <i>bYl h! \cd! UXXfYgg</i>                          | fl  Ț      I D                      |
| <b>hfUW</b>                                         | fl  Ț      HfUW                     |
| <i>bi aVYf</i>                                      | fl  ȚhfUW                           |
| <b>VZX</b>                                          | fl  Ț      6 8                      |
| <i>] bhYfZUW! hrøY</i><br><i>] bhYfZUW! bi aVYf</i> | fl  Ț                               |
| <i>[UhYkUm</i>                                      | ( )      IP      BFD      IP<br>BFD |

---

---

ID6 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** 10Ruijie(config-route-map)# **match ip address** 1Ruijie(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  
172.16.0.2Ruijie(config-route-map)#**end**

| ID   | 6 8 |
|------|-----|
| JFFD | ž   |
| ID   |     |

```

#          VRRP      BFD          BFD
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 192.168.201.11 255.255.255.0
Ruijie(config-if)#bfd interval 50 min_rx 50 multiplier 3
Ruijie(config-if)#vrrp 1 priority 120
Ruijie(config-if)#vrrp 1 ip 192.168.201.1
Ruijie(config-if)#vrrp 1 bfd 192.168.201.12

Ruijie(config-if)#end

```

|            |     |
|------------|-----|
|            |     |
| <b>bfd</b> | BFD |

## 62.2

BFD

› [show bfd neighbors](#)

### 62.2.1 show bfd neighbors

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]]

```

|                  |                 |
|------------------|-----------------|
|                  |                 |
| j fZ j fZ! blaY  | ( ) VRF         |
| W]Ybh            | ( )             |
| V[d              | BGP BFD         |
| cgdZ             | OSPF BFD        |
| f]d              | RIP BFD         |
| j ffd            | VRRP BFD        |
| ghUh] Wfci hY    | StaticRoute BFD |
| dVf              | PBR BFD         |
| ]dj ( ]d! UXXYgg | IPv4            |
| ]dj * ]d! UXXYgg | IPv6            |
| XYhU]`g          |                 |

## # show bfd neighbors

Ruijie# show bfd neighbors

```

OurAddr      NeighAddr    LD/RD  RH    Holdown(mult)  State
Int
172.16.11.1  172.16.11.2 1/2    1     532 (3 )      Up
Ge2/1

```

## # show bfd neighbors details

Ruijie# show bfd neighbors details

```

OurAddr      NeighAddr    LD/RD  RH    Holdown(mult)  State
Int
172.16.11.1  172.16.11.2 1/2    1     532 (3 )      Up
Ge2/1

```

Local Diag: 0, Demand mode: 0, Poll bit: 0

MinTxInt: 200000, MinRxInt: 200000, Multiplier: 5

Received MinRxInt: 50000, Received Multiplier: 3

Holdown (hits): 600(22), Hello (hits): 200(84453)

Rx Count: 49824, Rx Interval (ms) min/max/avg: 208/440/332

Tx Count: 84488, Tx Interval (ms) min/max/avg: 152/248/196

**Registered protocols: BGP**

Uptime: 02:18:49

**Last packet: Version: 1** - Diagnostic: 0

I Hear You bit: 1 - Demand bit: 0

Poll bit: 0 - Final bit: 0

Multiplier: 3 - Length: 24

My Discr.: 2 - Your Discr.: 1

Min tx interval: 50000 - Min rx interval: 50000

Min Echo interval: 0



|                |        |
|----------------|--------|
| OurAddr        | IP     |
| NeighAddr      | IP     |
| LD/RD          |        |
| RH             |        |
| Holdown(mult   | hello  |
| State          |        |
| Int            |        |
| Session state  | echo   |
| is UP and      | echo ( |
| using          | Echo   |
| Local Diag     |        |
| Demand         |        |
| Poll bit       |        |
| MinTxInt       |        |
| MinRxInt       |        |
| Multiplier     |        |
| Received       |        |
| Received       |        |
| Holdown (hits) |        |
| Hello (hits)   | hello  |
| Rx Count       | BFD    |
| Rx Interval    |        |
| Tx Count       | BFD    |
| Tx Interval    |        |

Registered

Uptime

UP

Last packet

BFD

|   |   |
|---|---|
|   |   |
| - | - |

## 63 RERP

### 63.1

RERP

RERP

```
' rerp enable
' rerp hello-interval
' rerp fail-interval
' rerp region
```

RERP

```
' ring
' edge-ring
' major-ring
```

#### 63.1.1 rerp enable

RERP

```
rerp enable
no rerp enable
```

disable

RERP

RERP

```
Ruijie(config)# rerp enable
```

|                    |      |
|--------------------|------|
|                    |      |
| <b>rerp region</b> | RERP |

### 63.1.2 rerp hello-interval

RERP

**rerp hello-interval** *interval*

**no rerp hello-interval**

*interval*

1-6

1

3

6

Ruijie(config)# **rerp fail-interval 6**

|                             |  |
|-----------------------------|--|
|                             |  |
| <b>rerp hello- interval</b> |  |

### 63.1.4 rerp region

RERP

RERP

**rerp region** *num***no rerp region** *num**num* , 1-64Ruijie# **rerp region 1**

|  |  |
|--|--|
|  |  |
|--|--|

|                    |      |
|--------------------|------|
| <b>rerp enable</b> | RERP |
|--------------------|------|

### 63.1.5 ring

RERP

vlan

**ring** *num* **role** [**master** | **backup** | **transit**] **ctrl-vlan** *vid* **primary-port**  
**interface** *interface-id* **secondary-port** **interface** *interface-id*  
**no ring** *num*

**num** *id***master** | **backup** | **transit****vid** *vlan***interface-id**

RERP

|             |        |      |      |       |
|-------------|--------|------|------|-------|
|             | RERP   | ,    | RERP |       |
| Master      | Backup | RERP |      | trunk |
| native vlan | vlan   |      |      |       |

```
Ruijie(config)# rerp region 1
Ruijie(config-rerp)# ring 1 role master ctrl-vlan 100
primary-port interface GigabitEthernet 0/1
secondary-port interface GigabitEthernet 0/2
```

|                    |      |
|--------------------|------|
| <b>rerp region</b> | RERP |
|--------------------|------|

### 63.1.6 edge-ring

RERP ring

```

edge-ring num role [primary-edge|secondary-edge] ctrl-vlan vid
shared-port interface interface-id sub-port interface
interface-id
no ring num

```

```

num id
primary-edge|secondary-edge
vid vlan
interface-id

```

RERP

```

RERP
RERP ring

```

```

Ruijie(config)# rerp region 1
Ruijie(config-rerp)# edge-ring 2 role primary-edge
ctrl-vlan 200 shared-port interface GigabitEthernet 0/1
sub-port interface GigabitEthernet 0/3

```

|                    |      |
|--------------------|------|
|                    |      |
| <b>rerp region</b> | RERP |
| <b>ring</b>        | rerp |

### 63.1.7 major-ring

```

major-ring num edge-ring-vlan vid

```

```

num id

```

*vid*      *vlan*

RERP

majory-ring

```
Ruijie(config)# rerp region 1  
Ruijie(config-rerp)# major-ring 1 edge-ring-vlan 100
```



**rerp region**

**RERP**

```

Ruijie# show rerp
rerp state                : enable
rerp admin hello interval : 1(*1s)
rerp admin fail interval  : 3(*1s)
rerp edge interval        : 1(*300 ms)
rerp local bridge         : 001a.a902.fe0b
-----
region 1
ring                       : 1
rerp oper hello interval   : 1
rerp oper fail interval    : 3
ring master                : 001a.a902.fe0b
ctrl-vlan                  : 100
edge-vlan                  :
role                       : master
primary-port               : Gi 0/4(forwarding)
secondary-port             : Gi 0/21(down)

```

## 63.2.2 show rerp statistics

RERP

**show rerp statistics region *num* ring *ring\_id***

EXEC

:

```

Ruijie# sh rerp statistics region 1 ring 1
The statistics for region 1 ring 1 GigabitEthernet 0/4
TX hello packets          23, RX hello packets          0
TX edge-hello packets     0, RX edge-hello packets     0
TX flush packets          0, RX flush packets          0
TX down packets           0, RX down packets           0
TX up packets              0, RX up packets              0
TX major fail packets     0, RX major fail packets     0
TX major resume packets 0, RX major resume packets 0
TX sub complete packets 0, RX sub complete packets 0

The statistics for region 1 ring 1 GigabitEthernet 0/5
TX hello packets          23, RX hello packets          0
TX edge-hello packets     0, RX edge-hello packets     0
TX flush packets          0, RX flush packets          0

```

RERP

---

```
TX down packets      0, RX down packets      0
TX up packets        0, RX up packets      0
TX major fail packets 0, RX major fail packets 0
TX major resume packets 0, RX major resume packets 0
TX sub complete packets 0, RX sub complete packets 0
```

### 63.2.3 clear rerp statistics

RERP

**clear rerp statistics**

EXEC

### 63.2.4 debug rerp

RERP

no

## 64 REUP

### 64.1

REUP

- ' **mac-address-table move update receive**
- ' **mac-address-table move update transmit**
  
- ' **switchport backup interface *interface-id* [ **preemption** {**mode** { **forced** | **bandwidth** | **off** } | **delay** *delay-time*}]**
- ' **mac-address-table update group**

#### 64.1.1 switchport backup interface *interface-id*

REUP

**switchport backup interface *interface-id***

**no switchport backup**

*interface-id*

ID

*interface-id*

fa 0/1

fa 0/2

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

Ruijie(config-if)# **switchport backup interface** *fa 0/2*

---

|                                             |  |
|---------------------------------------------|--|
|                                             |  |
| <b>show interface switchport<br/>backup</b> |  |

### 64.1.2 switchport backup interface *interface-id* preemption

REUP

**switchport backup interface *interface-id* preemption mode { forced | bandwidth | off }**

**no switchport backup interface *interface-id* preemption mode { forced | bandwidth | off }**

**switchport backup interface *interface-id* preemption delay *delay-time***

**no switchport backup interface *interface-id* preemption delay**

*interface-id* ID

*delay-time*

|                                         |  |
|-----------------------------------------|--|
|                                         |  |
| <b>show interface switchport backup</b> |  |

### 64.1.3 mac-address-table move update receive

REUP      MAC

**mac-address-table move update receive**

**no mac-address-table move update receive**

**disable**

MAC

MAC

MAC

MAC

Ruijie(config)# **mac-address-table move update receive**

|                                              |     |
|----------------------------------------------|-----|
|                                              |     |
| <b>mac-address-table move update transit</b> | MAC |

### 64.1.4 mac-address-table move update transit

REUP      MAC

**mac-address-table move update transit**

**no mac-address-table move update transit**

**disable**

MAC

MAC

Ruijie(config)# **mac-address-table move update transit**

|                                              |     |
|----------------------------------------------|-----|
|                                              |     |
| <b>mac-address-table move update transit</b> | MAC |

### 64.1.5 mac-address-table update group

MAC

**mac-address-table update group** [ *group-num* ]

**no mac-address-table update group**

*group-num* : MAC ID

group-10>08.18701870187018701u3AEi1D4229 0 Td16C.0057 Tc 2 Tr fd(ID

MAC

```
Ruijie(config-if)# mac-address-table update group 2
```

|                                                   |     |
|---------------------------------------------------|-----|
|                                                   |     |
| <b>show mac-address-table update group detail</b> | MAC |

## 64.2

```
± show interfaces [interface-id] switchport backup [detail]
```

```
± show mac-address-table update group [detail]
```

### 64.2.1 show mac-address-table update group [detail]

MAC

```
detail : MAC
```

MAC

EXEC

```
Ruijie# show mac-address-table update group detail
Mac-address-table Update Group:1
Received mac-address-table update message count:0
Group member  Receive Count    Last Receive Switch-ID
Receive Time
-----
Gi0/1          0                0000.0000.0000
Gi0/2          0                0000.0000.0000
```

### 64.2.2 show interfaces [*interface-id*] switchport backup [detail]

*interface-id* : ID  
*detail* :

# 65 RLDP

## 65.1

RLDP

- › rldp detect-interval
- › rldp detect-max
- › rldp enable
- › rldp loop-detect enable

### 65.1.1 rldp loop-detect enable

RLDP

**rldp loop-detect enable**

**no rldp loop-detect enable**

|  |  |  |
|--|--|--|
|  |  |  |
|  |  |  |
|  |  |  |

└───┘

└───┘

└───┘

RLDP

RLDP

└───┘

Ruijie(config)# **rldp loop-detect enable**

└───┘

**rldp port**

RLDP



### 65.1.3 rldp detect-max

RLDP

**rldp detect-max num**

**no rldp detect-max**

|  |            |        |
|--|------------|--------|
|  |            |        |
|  | <i>num</i> | , 2-10 |

2

5  
 Ruijie(config)# **rldp detect-max 5**

|  |                             |  |
|--|-----------------------------|--|
|  |                             |  |
|  | <b>rldp detect-interval</b> |  |

|  |   |   |
|--|---|---|
|  |   |   |
|  | - | - |

### 65.1.4 rldp enable

RLDP

**rldp enable**

**no rldp enable**

|  |  |  |
|--|--|--|
|  |  |  |
|  |  |  |
|  |  |  |

|  
|  
|

|  
|  
|

|  
|  
|

RLDP

RLDP

|  
|  
|

Ruijie(config)# **rldp enable**

|



**rldp port**

RLDP

RLDP

|  |                  |      |
|--|------------------|------|
|  |                  |      |
|  | <b>rldp port</b> | RLDP |
|  |                  |      |
|  |                  |      |
|  | -                | -    |

### 65.1.6 rldp port

rldp

**rldp port { unidirection-detect | bidirection-detect | loop-detect } { warning | shutdown-svi | shutdown-port | block }**

**no rldp port { unidirection-detect | bidirection-detect | loop-detect }**

|  |                            |              |
|--|----------------------------|--------------|
|  |                            |              |
|  | <b>unidirection-detect</b> |              |
|  | <b>bidirection-detect</b>  |              |
|  | <b>loop-detect</b>         |              |
|  | <b>warning</b>             |              |
|  | <b>shutdown-svi</b>        | shutdown svi |
|  | <b>shutdown-port</b>       | shutdown     |
|  | <b>block</b>               |              |

┌  
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└

RLDP

RLDP

fas 0/1

rldp

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

Ruijie(config-if)# **rldp port loop-detect block**

|  |  |  |
|--|--|--|
|  |  |  |
|--|--|--|

|  |                    |      |
|--|--------------------|------|
|  | <b>rldp enable</b> | rldp |
|  |                    |      |
|  |                    |      |
|  | -                  | -    |

### 65.1.7 rldp reset

|                           | rldp shutdown      | disable | rldp |
|---------------------------|--------------------|---------|------|
| <b>rldp reset</b>         |                    |         |      |
|                           |                    |         |      |
|                           | -                  |         | -    |
|                           |                    |         |      |
|                           |                    |         |      |
|                           |                    |         |      |
| Ruijie# <b>rldp reset</b> |                    |         |      |
|                           |                    |         |      |
|                           | <b>rldp enable</b> |         | Rldp |
|                           |                    |         |      |
|                           |                    |         |      |
|                           | -                  |         | -    |

### 65.2

- > show rldp
- > debug rldp

### 65.2.1 show rldp

rldp

**show rldp [interface *interface-id*]**

|  |                     |  |
|--|---------------------|--|
|  |                     |  |
|  | <i>Interface-id</i> |  |

└──

└──

└──

└──

|  |   |   |
|--|---|---|
|  |   |   |
|  | - | - |

└──

|  |   |   |
|--|---|---|
|  |   |   |
|  | - | - |

### 65.2.2 debug rldp

rldp

no

**debug rldp [packet | event | error]**

**undebug rldp [packet | event | error]**

|  |        |      |
|--|--------|------|
|  |        |      |
|  | packet | rldp |
|  | event  |      |
|  | error  |      |

└──

RLDP

# 66 DLDP

## 66.1

DLDP

- > [dldp](#)
- > [dldp passive](#)
- > [clear dldp](#)

### 66.1.1 dldp

DLDP

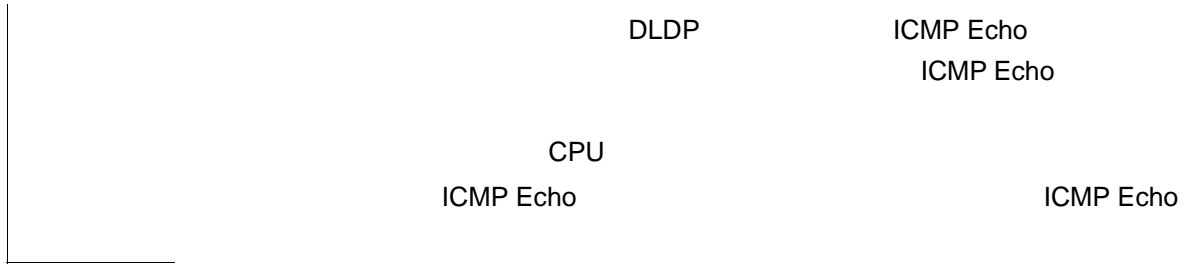
no

IP DLDP

**dldp** *ip-address* [**next-hop** *ipv4-address*] [**interval** *tick* | **retry** *retry-num* | **resume** *resume-num*]

**no dldp** *ip-address*

```
Ruijie(config)#interface vlan 1
Ruijie(config-if-VLAN 1)#ip address 10.83.132.1 255.255.255.0 //
vlan1 IP
Ruijie(config-if-VLAN 1)#dldp 10.83.132.10
2 10.83.131.10 DLDP
Ruijie#config
Ruijie(config)#interface vlan 1
Ruijie(config-if-VLAN 1)#ip address 10.83.132.1 255.255.255.0 //
vlan1 IP
Ruijie(config-if-VLAN 1)#dldp 10.83.131.10 next-hop 10.83.132.2 //
IP
3 10.83.132.10 DLDP
Ruijie#config
Ruijie(config)#interface vlan 1
Ruijie(config-if-VLAN 1)#no dldp 10.83.132.10
```





10.3(5)

|   |   |
|---|---|
|   |   |
| - | - |

## 66.3

### 66.3.1 clear dldp

dldp up/down

**clear dldp** [**interface** *interface-name* [*ip-address*]]

|                       |    |
|-----------------------|----|
|                       |    |
| <i>interface-name</i> |    |
| <i>ip-address</i>     | IP |

DLDP up/down IP  
 up/down  
 IP up/down up/down

1 up/down  
 Ruijie#**clear dldp**  
 2 interface vlan 1 up/down  
 Ruijie#**clear dldp interface vlan 1**  
 3 interface vlan 1 10.83.132.1 up/down  
 Ruijie# **clear dldp interface vlan 1 10.83.132.1**

|   |   |
|---|---|
|   |   |
| - | - |

10.3(5)

|  |   |   |
|--|---|---|
|  |   |   |
|  | - | - |

# 67

CPU

( AP )

```
Ruijie(config-if)# tp-guard port enable
```

```
Ruijie(config-if)# no tp-guard port enable
```

**topology guard**

## 67.2 TPP

### 67.2.1 show tpp

**show tpp**

tpp

```
Ruijie# show tpp
```

**topology guard**

---

# 68

## 68.1

- ' **redundancy**
  
- ' **auto-sync**
- ' **auto-sync time-period**
- ' **switchover timeout**
  
- ' **redundancy reload**
- ' **redundancy forceswitch**

### 68.1.1 redundancy

**redundancy**

**redundancy**

**auto-sync auto-sync time-period switchover timeout**

```
Ruijie# config terminal  
Ruijie(config)# redundancy  
Ruijie(config-red)# exit  
Ruijie(config)#
```

### 68.1.2 auto-sync

---

running-config startup-config

**auto-sync { standard | running-config | startup-config}**

**no auto-sync { standard | running-config | startup-config}**

**standard**

**running-config**

**startup-config**

**auto-sync standard**

standard

startup-config

Ruijie(config)# **redundancy**

Ruijie(config-rdnd)# **auto-sync startup-config**

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

Ruijie(config)#

startup-config

Ruijie(config)# **redundancy**

Ruijie(config-rdnd)# **no auto-sync startup-config**

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

Ruijie(config)#

### 68.1.3 auto-sync time-period

running-config startup-config

**auto-sync time-period *value***

**no auto-sync time-period**

*value*



---

```
Ruijie# config terminal
Ruijie(config)# redundancy
Ruijie(config-red)# switchover timeout 4000
Ruijie(config-red)# exit
Ruijie(config)#
```

## 68.1.5 redundancy reload

```
privileged EXEC          redundancy reload      Slave
Master Slave
redundancy reload {peer | shelf}
t          2          }
```

---

```
Ruijie# redundancy forceswitch  
Proceed with switchover to standby PRE? [confirm] y
```

---

```
peer state = 37 -Standby Hot
```

```
...
```

## 68.2.2 show redundancy auto-sync

```
user EXEC    privileged EXEC    show redundancy
auto-sync    redundancy      (
              auto-sync    )
```

```
Ruijie> enable
Ruijie# show redundancy auto-sync
Redundancy auto-sync mode: auto-sync standard.
...
```

## 68.2.3 show redundancy switchover

```
user EXEC    privileged EXEC    show redundancy
switchover   redundancy      switchover
```

```
Ruijie> enable
Ruijie# show redundancy switchover
redundancy switch timeout is : 4000 ms.
...
```

---

# 69

## 69.1

- ' cd
- ' cp
- ' ls
- ' makefs
- ' mkdir
- ' mv
- ' pwd
- ' rm
- ' rmdir

### 69.1.1 cd

**cd** *DIRECTORY*

*DIRECTORY*

“ ”  
..

“ ”  
.

**ls**

tmp

Ruijie#

---

|           |  |
|-----------|--|
|           |  |
| <b>ls</b> |  |

### 69.1.2 cp

**cp dest** {*DESTINE\_FILE* | *DIRECTORY*} **sour** *SOURCE\_FILE*  
**cp sour** *SOURCE\_FILE* **dest** {*DESTINE\_FILE* | *DIRECTORY*}

*DESTINE\_FILE*

*DIRECTORY*

*SOURCE\_FILE* ( )

---

**cp**

---

log.txt :

Ruijie# **cp sour** *log.txt* **dest** *../log\_bak.txt*

### 69.1.3 ls

**ls** *PATHNAME*

---

*PATHNAME*

```
Ruijie# ls
      tmp
Ruijie# ls tmp
```

## 69.1.4 makefs

```
makefs dev DEVNAME fs FSNAME
makefs fs FSNAME dev DEVNAME
```

```
DEVNAME          (      )
FSNAME
```



---

```

a ( type file); b '?'
'?'
,
log.txt , config.txt,
,
Ruijie# mv sour tmp/log.txt dest ../config.txt
log.txt tmp
Ruijie# mv dest /mnt/tmp sour tmp/log.txt

```

## 69.1.7 pwd

**pwd**

|            |  |
|------------|--|
|            |  |
| <b>pwd</b> |  |

---

Ruijie# **pwd**

## 69.1.8 rm

**rm** *FILE*

*FILE* ( )

,

log.txt

Ruijie# **rm** *log.txt*

|              |        |
|--------------|--------|
|              |        |
| <b>rmdir</b> | rm , , |

## 69.1.9 rmdir

**rmdir** *directory*

*directory* ,

---

**rm**

**tmp**

Ruijie# **rmdir** *tmp*

Ruijie# **ls**

---

# 70

## 70.1 CPU-LOG

- ' show cpu
- ' cpu-log

### 70.1.1 show cpu

CPU show cpu  
show cpu

CPU 5 1  
5 CPU 5  
1 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
0    0%    0%    0%    LISR INT
1    7%    2%    1%    HISR INT
```

---

|    |    |    |    |                         |
|----|----|----|----|-------------------------|
| 4  | 0% | 0% | 0% | printk_task             |
| 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% | dhcpc_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% | rerp_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_rcv_task          |
| 61 | 0% | 0% | 0% | ntp_task               |
| 62 | 0% | 0% | 0% | sla_deamon             |
| 63 | 0% | 3% | 1% | track_daemon           |
| 64 | 0% | 0% | 0% | pbr_guard              |
| 65 | 0% | 0% | 0% | vrrpd                  |
| 66 | 0% | 0% | 0% | psnpd                  |
| 67 | 0% | 0% | 0% | igsnpd                 |
| 68 | 0% | 0% | 0% | coa_rcv                |
| 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                   |

```

          5          3          5          1
          CPU      CPU      LISR  HISR
          CPU
'   No
'   5Sec          5      CPU
'   1Min          1      CPU
'   5Min          5      CPU
          2          LISR  CPU      HISR
          CPU      CPU      CPU
          idle      CPU      Windows      System Idle Process
          75%      CPU      75%      idle      5      CPU

```

## 70.1.2 cpu-log

```

          CPU      ,      cpu-log
cpu-log log-limit low_num high_num

log-limit
low_num CPU
high_num CPU

```

---

```

          100%      90%

          CPU          CPU
         CPU      CPU
        CPU          CPU
        CPU          CPU

          CPU          70% CPU
          80%

ruijie(config)# cpu-log log-limit 70 80

          CPU          80%

Oct 20 15:47:01 %SYSCHECK-5-CPU_USING_RATE: CPU
utilization in one minute : 95% Using most cpu's task
is ktimer : 94%

          CPU          70%

Oct 20 15:47:01 %SYSCHECK-5-CPU_USING_RATE: CPU
utilization in one minute :68% Using most cpu's task
is ktimer : 60%
Oct 20 15:47:01 %SYSCHECK-5-CPU_USING_RATE: The CPU
using rate has down!

```

## 70.2

```

show memory
memory-lack exit-policy
show memory protocols

```

### 70.2.1 show memory

```

show

memory

show memory

```

---

---

worsen  
OSPF RIP PIM-SM

policy (bgp|ospf|pim-sm|rip)

exit-policy

| p | BGP OSPF PIM RIP |
|---|------------------|
|   |                  |

---

**show memory protocols**

|  |  |
|--|--|
|  |  |
|  |  |

/



---

|                       |  |
|-----------------------|--|
|                       |  |
| <b>show threshold</b> |  |

## 70.3.2

> [show threshold](#)

### show threshold

**show threshold {cpu | memory | temperature} [M1 | M2 | slot *n* | member *n*]**

|                                   |                                                       |
|-----------------------------------|-------------------------------------------------------|
|                                   |                                                       |
| <b>cpu   memory   temperature</b> | <b>cpu CPU</b><br><b>memory</b><br><b>temperature</b> |
| <b>M1   M2   slot <i>n</i></b>    | <i>n</i>                                              |
| <b>member <i>n</i></b>            | <i>n</i>                                              |

1 M1 CPU  
Ruijie# **show threshold cpu M1**

2  
Ruijie# **show threshold memory**

---

|                      |  |
|----------------------|--|
|                      |  |
| <b>threshold set</b> |  |

---

# 71

## 71.1

### 71.1.1 logging on

no

**logging on**

**no logging on**

RGOS

Console

VTY

FLASH Syslog Server

1 Log

Ruijie(config)# **no logging on**

|                            |               |
|----------------------------|---------------|
|                            |               |
| <b>logging buffered</b>    |               |
| <b>logging</b>             | Syslog Server |
| <b>logging file flash:</b> | FLASH         |
| <b>logging console</b>     |               |

---

|                        |                |
|------------------------|----------------|
| <b>logging monitor</b> | VTY ( telnet ) |
| <b>logging trap</b>    | Syslog Server  |

### 71.1.2 terminal monitor

```

VTY
no
terminal monitor
terminal no monitor

VTY
VTY

VTY
VTY
VTY

```

---

**no logging buffered**

```
Ruijie(config)# logging buffered 10000 6
```

| <b>logging on</b>    |  |
|----------------------|--|
| <b>show logging</b>  |  |
| <b>clear logging</b> |  |

## 71.1.4 logging server

### Syslog Sever

Syslog server

Syslog Server

no

**logging server** {*ip-address* [**vrf** *vrf-name*] | **ipv6** *ipv6-address*}

**no logging server** {*ip-address* [**vrf** *vrf-name*] | **ipv6** *ipv6-address*}

*ip-address*

IP

*vrf vrf-name*

VRF VPN

*ipv6 ipv6-address*

IPV6

syslog server

Syslog server

RGOS

5 Syslog Server

Syslog Server

202.101.11.1 syslog server

```
Ruijie(config)# logging server 202.101.11.1
```

IPV6

AAAA:BBBB::FFFF

```
Ruijie(config)# logging server ipv6 AAAA:BBBB::FFFF
```

---

|                     |               |
|---------------------|---------------|
|                     |               |
| <b>logging on</b>   |               |
| <b>show logging</b> |               |
| <b>logging trap</b> | syslog server |

### 71.1.5 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
128K
level 1 FLASH 6
FLASH
Syslog Server
FLASH
txt

```

---

---

```

1.
2.
   txt
3.   15
      FLASH
16  FLASH

```

---

```

FLASH trace.txt
64K, 6
Ruijie(config)# logging file flash:trace

```

| <b>logging on</b>   |       |
|---------------------|-------|
| <b>show logging</b> |       |
| <b>more flash</b>   | FLASH |

## 71.1.6 logging console

```

no
logging console level
no logging console

level 0 7
1

Debugging (7)

```

---

**show logging**

6

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

|                     |  |
|---------------------|--|
|                     |  |
| <b>logging on</b>   |  |
| <b>show logging</b> |  |

### 71.1.7 logging monitor

VTY telnet SSH no VTY

**logging monitor *level***

**no logging monitor**

*level*

1

Debugging (7)

VTY terminal  
**monitor** VTY  
**logging monitor**

**Logging monitor** VTY

VTY 6

---

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

|                     |  |
|---------------------|--|
|                     |  |
| <b>logging on</b>   |  |
| <b>show logging</b> |  |

## 71.1.8 logging trap

```
                Syslog Server
                no                Syslog Server

logging trap level
no logging trap

level
                                1

Informational(6)

                Syslog Server                logging
                Syslog Server                logging trap

show logging

                6                202.101.11.22
                Syslog Server

Ruijie(config)# logging 202.101.11.22
Ruijie(config)# logging trap informational
```

|  |  |
|--|--|
|  |  |
|--|--|

---

|                   |  |
|-------------------|--|
| <b>logging on</b> |  |
|-------------------|--|

---

---

2 Syslog

2

| <b>Numerical Code</b> | <b>Facility</b>                          |
|-----------------------|------------------------------------------|
| 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)

```

```
RGOS (local7) 23
```

```
Syslog kernel
```

```
Ruijie(config)# logging facility kern
```

|                        |  |
|------------------------|--|
|                        |  |
| <b>logging console</b> |  |

### 71.1.12 logging count

```
no
```

```
logging count
```

```
no logging count
```

```
count
```

```
no logging
```

---

Ruijie(config)# **logging count**

| <b>show logging count</b> |  |
|---------------------------|--|
| <b>show logging</b>       |  |

### 71.1.13 logging rate-limit

no

---

```
Ruijie(config)#logging rate-limit all 10 except
warnings
```

| show logging count |  |
|--------------------|--|
| show logging       |  |

### 71.1.14 logging synchronous

```
no
```

```
logging synchronous
```

```
no logging synchronous
```

```
Ruijie(config)#
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
```

---

---

no

default

**service timestamps** *message-type* [*uptime* | *datetime* [*msec* | *year*]]

**no service timestamps** *message-type*

**default service timestamps** *message-type*

| <i>message-type</i> | log   | debug | log             |
|---------------------|-------|-------|-----------------|
| 0 6                 | debug |       | 7               |
| <i>uptime</i>       | * *   | * *   | 07:00:10:41     |
| <i>datetime</i>     |       |       | Jul 27 16:53:07 |
| <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
```



---

---

## 71.1.18 more flash

FLASH

**more flash:filename**

*Filename*

FLASH

"//f2" "//f3"

FLASH

Ruijie# **more flash://f2/log.txt**

look up file in the extended flash://f2/log.txt

00004 2004-11-17 4:1:32 Ruijie: %5:Reload.2]TJuestd fb-6(ey-6(e)]TJ0

Ⓢ\*Ⓞ

---

Ruijie# **clear logging**



---

```
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
```



2BÖ

Syslog logging

Trap logging

Log Buffer

|               |  |
|---------------|--|
|               |  |
| logging on    |  |
| clear logging |  |

**71.2.2 show logging count**

**show logging count**

**logging**

**count show logging count**

**show logging**

**show logging count**

```

Ruijie# show logging count
Module Name  Message Name Sev Occur      Last Time
=====
SYS          CONFIG_I      5  1      Jul 6 10:29:57
-----
SYS TOTAL                    1

```



---

00003 2004-11-17 10:57:18 Ruijie: %7:%LINK CHANGED:  
Interface FastEthernet 0/1, changed state to  
administratively down  
00002 2004-11-17 10:20:59 Ruijie: %7:%LINE PROTOCOL  
CHANGE: Interface FastEthernet 0/0, changed state to UP  
00001 2004-11-17 10:20:59 Ruijie: %7:%LINK CHANGED:  
Interface FastEthernet 0/0, changed state to up

| <b>logging on</b>    |  |
|----------------------|--|
| <b>clear logging</b> |  |
| <b>show logging</b>  |  |

---

# 72

## 72.1

' install

---

Slot : 2  
User Status : installed  
Software Status:87693e

---

```

Ruijie# show version module detail 2
Device : 1
Slot : 2
User Status : none
Software Status: none
Online Module :
Type :
Ports : 0
Version :
Configured Module :
Type :
Ports :
Version :
Ruijie#

```

| <b>install slot-num moduletype</b> |  |
|------------------------------------|--|
| <b>show version slots</b>          |  |

### 72.1.3 remove configuration module slot-num

**remove configuration module *slot-num***

*slot-num*

```
Ruijie(config)# remove configure module 4
```

### 72.1.4 reset module slot-num

**reset module *slot-num***

---

*slot-num*

Ruijie# **reset module 4**

## 72.2

### 72.2.1 show version module detail [module-num]

**show version module detail** [*module-num*]

*module-num*

```
Ruijie# show version module detail 2
Device   : 1
Slot     : 2
User Status : none
Software Status: none
Online Module :
Type     :
Ports    : 0
Version  :
Configured Module :
Type     :
Ports    :
Version  :
Ruijie#
```

|                           |  |
|---------------------------|--|
|                           |  |
| <b>show version slots</b> |  |

---

## 72.2.2 show version slots [slot-num]

**show version slots** [*slot-num*]

*num*

```
Ruijie# show version slots
Dev Slot  Configured Module Online Module  User Status
Software Status
--- ----  -
1 1      none           none
1 2 M8606-24SFP/12GT M8606-24SFP/12GT installed none
1 3 M8606-2XFP M8606-2XFP uninstalled cannot startup
1 4 M8606-24GT/12SFP M8606-24GT/12SFP installed ok
1 M1 M8606-CM M8606-CM                master
1  M2                none
```

|                                   |  |
|-----------------------------------|--|
|                                   |  |
| <b>show version moduel detail</b> |  |

---

# 73

## 73.1

- ' **lcd trap-number** *num*
- ' **memory-rate rising-threshold** *num*

### 73.1.1 lcd trap-number num

no

**lcd trap-number** *num*

**no lcd trap-number**

*num* 1-1000

*num* 100

100

200

**lcd trap-num** *200*

### 73.1.2 memory-rate rising-threshold num

*num* 1-100

---

num 80

num 80 **show running-config** **memory-rate**  
**rising-threshold 80**

Ruijie(config)# **memory-rate rising-threshold 60**

**74**

Disk Partitions

/dev/uba/disc0/part1  
cd /mnt/uba

/mnt/uba

## 74.1.2 usb remove

**usb remove** *Device\_ID*

*Device\_ID*            USB

usb

USB

usb

```
Ruijie# usb remove 778
```

```
OK, now you can pull out the device 778.
```

```
0:1:1:38 Ruijie: USB-5-USB_DISK_REMOVED: USB Device
```

```
<USB Mass Storage Device> Removed!
```

usb

## 75 POE

POE

- ' **Poe enable**
- ' **Poe-power lower lower**
- ' **Poe-power upper upper**
- ' **Poe disconnect-mode mode**

### 75.1

#### 75.1.1 poe enable

**no**

**poe enable**

**no poe enable**

```
Ruijie(config-if)# poe enable  
Ruijie(config-if)# no poe enable
```

#### 75.1.2 poe-power lower lower

**no**

**poe-power lower *lower***

**no poe-power lower**

**lower**

**45-47**

POE 46

```
Ruijie# configure
Ruijie(config)# poe-power lower 46
Ruijie(config)# end
Ruijie#
```

### 75.1.3 poe-power upper upper

**no**

```
poe-power upper upper
no poe-power upper
```

upper 55-57

POE 56

```
Ruijie# configure
Ruijie(config)# poe-power upper 56
Ruijie(config)# end
```

### 75.1.4 poe disconnect-mode mode

**no**

```
poe disconnect-mode mode
no poe disconnect-mode
```

mode [ac/dc]

POE dc

```
Ruijie# configure
```

```
Ruijie(config)# poe disconnect-mode dc
Ruijie(config)# end
```

## 75.2

POE

```
' show poe interfaces
' show poe powersupply
```

### 75.2.1 show poe interfaces

POE

```
show poe interfaces interface-id
```

poe

```
Ruijie# show poe interface gigabitethernet 0/2
Interface : Gi0/2
Port power enabled : ENABLE
Port connect status : OFF
Port PD Class : no PD devices
Port max power : 15.4 W
Port current power : 0 W
Port peak power : 0 W
Port current : 0 mA
Port voltage : 48 V
Port trouble cause : normal
```

### 75.2.2 show poe powersupply

POE

```
show poe powersupply
```

```
Ruijie# show poe powersupply
PSE Total Power :1200.0 W
PSE Total Power Consumption : 0 W
PSE Available Power : 1200.0 W
PSE Peak Value : 0 W
```