



RG-S8600

IPv6

RGOS 10.3(5b1)

©2000-2010



RGOS®10.3(5b1)

'
'
'

1.

5

t

Courier New

5

2.

Arial

[]

[]

{x|y|...}

[x|y|...]

//

3.

r

/ .

/ .

1)

2)

3)

1 CLI

1.1 alias

alias

no

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

mode
command-alias
original-command

EXEC

EXEC

| | |
|-----------|----------------|
| | |
| h | help |
| p | ping |
| s | show |
| u | undebug |
| un | undebug |

no alias exec

alias ?

Ruijie(config)# **alias ?**

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

*

**command-alias=original-command*

| | | | |
|------|-----|--------|------|
| EXEC | "s" | "show" | "s?" |
| 's' | | | |

Ruijie# **s?**

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

| | |
|---------------------|--------------|
| exec | |
| interface | |
| ip-dhcp-pool | DHCP |
| keychain | KeyChain |
| keychain-key | KeyChain-key |
| time-range | 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 |

| | |
|--------------|--|
| | |
| alias | |



disable

Ruijie# **disable 10**

| | |
|---------------|--|
| | |
| enable | |

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
'

r . .

```

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

```

```
pw10
```

```
Ruijie(config)# enable secret 0 pw10
```

| | |
|------------------------|--|
| | |
| enable password | |

2.1.5 service password-encryption

```

service password-encryption
no
service password-encryption

```

```

service password-encryption
password
service password-encryption show running write
password service
password-encryption

```

```
Ruijie(config)# service password-encryption
```

| | |
|------------------------|--|
| | |
| enable password | |

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

```

| | |
|--------------|--|
| | |
| login | |

2.1.7 login

```

AAA
login no
login
no login

```

```

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

VTY

radius

```

Ruijie(config)# aaa new-model
Ruijie(config)# aaa authentication login default radius
Ruijie(config)# line vty 0
Ruijie(config-line)# login authentication default

```

| | |
|--------------------------|-----|
| | |
| aaa new-model | AAA |
| aaa authentication login | |

2.1.10 username

username

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 | |

2.1.12 lockable

lock

line

lockable

lock

no

lockable

| | |
|--------------------------|--------|
| /source-interface | telnet |
|--------------------------|--------|

telnet

```

telnet 192.168.1.11
vlan 1      VRF      vpn1
Ruijie# telnet 192.168.1.11 /source interface vlan 1
/vrf vpn1

```

| | |
|----------------------|--|
| | |
| Show sessions | |
| exit | |

2.1.14 ip telnet source-interface

```

IP      Telnet
ip telnet source-interface
ip telnet source-interface interface-name

interface-name      IP      Telnet

```

| | |
|---------------|--------|
| | |
| telnet | 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 }
```

| | |
|----------------------|---------------|
| | |
| ssh-sesrver | SSH Server |
| telnet-server | Telnet Server |
| web-server | Http Server |
| snmp-agent | Snmp Agent |

no enable service

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

| | |
|---------------------|--|
| | |
| show service | |

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*

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

calendar

clock clock
Ruijie# clock update-calendar

| | |
|---------------------|--|
| | |
| clock read-calendar | |

2.2.3 exec-timeout

LINE exec-timeout
no exec-timeout LINE
exec-timeout *minutes* [*seconds*]

minutes
seconds

10 min

LINE

LINE

line vty 0 5 30 :

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

2.2.4 hostname

hostname

hostname *name*

name
63

Ruijie

CHAP

BeiJingAgenda

Ruijie(config)# **hostname** *BeiJingAgenda*
BeiJingAgenda(config)#

```
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

```
running-config show
show running-config
```

2.2.8 show startup-config

N

```
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

```
vty          vty
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
          ^^x      none      ^M
Timeouts:      Idle EXEC#7G8f114.68 -1.5.7( )-Sess7(ivation )]TJ0 -
```

write

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

| | | | |
|-----------------|-------------------------------|----------------------------|------|
| memory | running-config | NVRAM | copy |
| | running-config startup-config | | |
| network | | TFTP | copy |
| | running-config tftp | | |
| terminal | | show running-config | |

memory

```
Ruijie# write  
Building configuration...  
[OK]
```

| | |
|----------------------------|--|
| | |
| show running-config | |
| copy | |

3 LINE

3.1 LINE

3.1.1 line

LINE

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

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

LINE

VTY
NONE
default transport input

TTY

Line

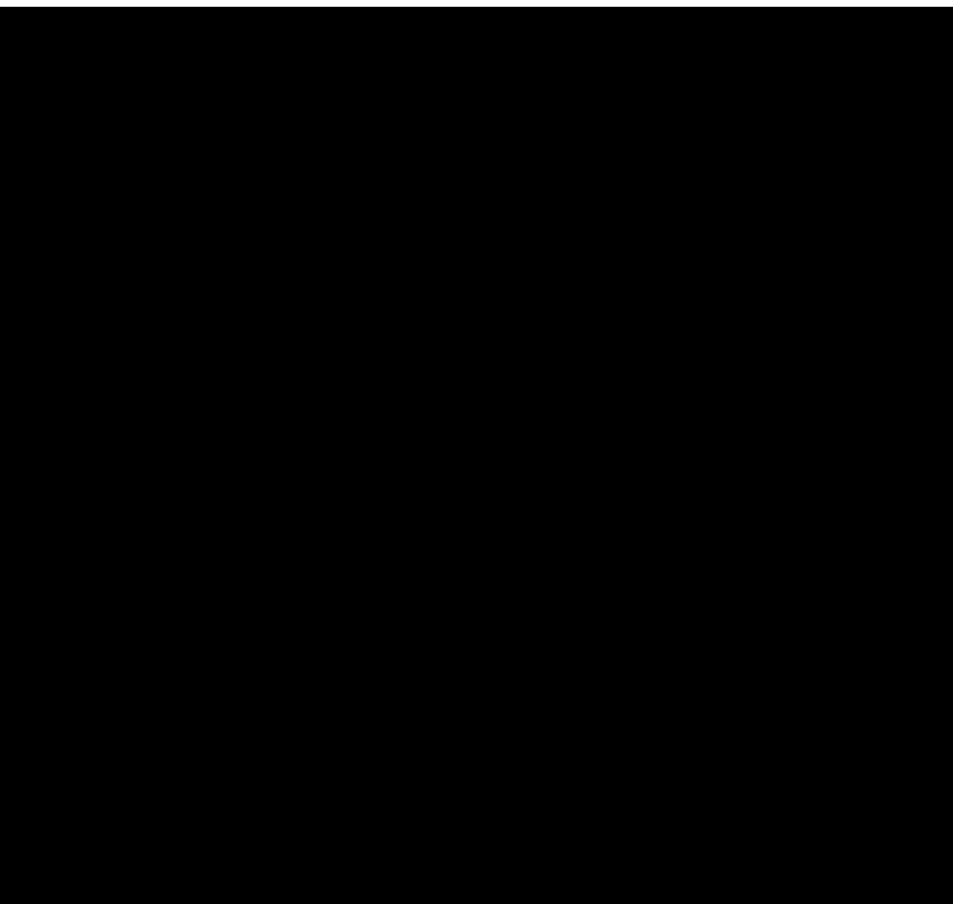
Line

VTY

VTY

~~Line~~

running



LINE

| | |
|---------------------------|-------------|
| <i>access-list-number</i> | access-list |
| in | |
| out | |

Line

Line

4

4.1

| | CLI | COPY |
|----------|------------------|--------------------|
| ' Xmodem | | copy xmodem |
| ' Tftp | copy tftp | |

4.1.1 copy xmodem

xmodem

xmodem

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

filename

```
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

```
r . . .
          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://
```

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> | |
| timeout | |
| <i>data</i> | |
| <i>source</i> | IPv4 |

IP 2 5 100Byte

Ping

ping

ping

| | |
|------------------------|------|
| <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 | Short |

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)#

| | |
|---------------------------------|--|
| | |
| show interfaces | |

S8600

' 8
' 128 AP

6.1.2 interface giagbitEthernet

interface gigabitEthernet *mod-num/port-num*

mod-num/port-num /

no
show interfaces gigabitEthernet

show interfaces

Ruijie(config)# interface gigabitEthernet 1/2
Ruijie(config-if)#

| | |
|-----------------|--|
| | |
| show interfaces | |

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)#
```

| | |
|------------------------|--|
| | |
| show interfaces | |

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

6.1.4 medium-type

no .

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

fiber
copper

Ap

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

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

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

6.1.5 description

no

description *string*

no description

string

show interfaces

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



auto
full
half

show interfaces

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

| | |
|------------------------|--|
| | |
| show interfaces | |

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
```

| | |
|------------------------|--|
| | |
| show interfaces | |

6.1.10 mtu

mtu

Mtu num

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

1500

mtu

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

| | |
|------------------------|--|
| | |
| show interfaces | |

6.1.11 carrier-delay

carrier-delay

no

carrier-delay [*seconds*]

no carrier-delay

seconds 1 60

2

DCD

DCD Down Up

DCD

DCD

5

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

Ruijie(config)# **carrier-delay** 5

6.1.12 clear counters

clear counters [*interface-id*]

interface-id

show interfaces

clear counters

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

| | |
|------------------------|--|
| | |
| show interfaces | |

6.1.13 clear interface

```
clear interface interface-id
```

interface-id

```

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

```

```
Ruijie# clear interface gigabitethernet 1/1
```

| | |
|-----------------|--|
| | |
| shutdown | |

6.1.14 switchport

```

2
3
switchport
no switchport

```

2

switchport

2

3

2

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

| | |
|------------------------|--|
| | |
| show interfaces | |

S8600

3 AP

128 L3 AP

2K IP

6.1.15 switchport mode

access port trunk port, switch port 802.1Q no

switchport mode {access | trunk}

no switchport mode

| | | |
|---------------|-------------|-------------|
| | | |
| access | switch port | access port |
| trunk | switch port | trunk port |

switch port access

switch port access VLAN
switchport access vlan VLAN

```

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

```

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

| | |
|--------------------------|-------------------------------------|
| | |
| switchport access | statics accessport VLAN |
| switchport trunk | trunkport native VLAN Trunk VLAN |

6.1.16 switchport access

```

                access port      VLAN
                no                VLAN

switchport access vlan vlan-id
no switchport access vlan

vlan-id      VLAN ID

switch port      access      VLAN  VLAN 1

```

```

                VLAN ID      VLAN ID
                VLAN      VLAN
VLAN ID      VLAN
                trunkport

```

```

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

```

| | |
|-------------------------|-------------------------------------|
| | |
| switchport mode | switch port |
| switchport trunk | trunkport native VLAN Trunk VLAN |

6.1.17 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}

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

VLAN all Native VLAN VLAN 1

Native VLAN

Trunk native VLAN native VLAN
UNTAG VLAN
VLAN ID IEEE 802.1Q PVID native

VLAN VLAN ID Trunk native VLAN
 UNTAG
VLAN
 Trunk VLAN 1 4094
 Trunk VLAN VLAN
 Trunk

show interfaces switchport

VLAN 2 1/15

```
Ruijie(config)# interface fastethernet 1/15
Ruijie(config-if)# switchport trunk allowed vlan remove
2
Ruijie(config-if)# end
Ruijie# show interfaces fastethernet1/15 switchport
Switchport is enabled
Mode is trunk port
Access vlan is 1,Native vlan is 1
Protected is disabled
Vlan lists is
1,3-4094
```

| | |
|--------------------------|----------------------------|
| | |
| show interfaces | |
| switchport access | statics accessport VLAN |

6.1.18 snmp trap link-status

Link LinkTrap
 no SNMP LinkTrap, LinkTrap

snmp trap link-status
no snmp trap link-status

Link SNMP
 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(config-if)# snmp trap link-status
```

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

6.2

6.2.1 show interfaces

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

interface-id aggregateport SVI
 loopback

counters

description link

status

switchport

trunk trunking port Aggregate port

```

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

```

| | |
|----------------------------------|---------------------------------|
| | |
| duplex | |
| flowcontrol | |
| interface gigabitEthernet | |
| interface aggregateport | |
| interface vlan | switch virtual interface SVI |
| shutdown | |
| speed | |
| switchport priority | 802.1q |
| switchport protected | |

7 Aggregate Port

7.1

7.1.1 port-group

```

Aggr8Wate Port
Aggr8Wate Port
no
    
```

```

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

Aggr8Wate Port

| | |
|--------------------------|----------------------------------|
| | |
| <i>port-group-number</i> | Aggr8Wate Port Aggr8Wate Port |

```

AP
native VLAN
VLAN
AP
trunk port
    
```

1/3 AP 3

```

Ruijie(config)# interface gigabitethernet 1/3
Ruijie(config-if)# port-group 3
    
```

S8600

```

'
8
'
128 AP
    
```

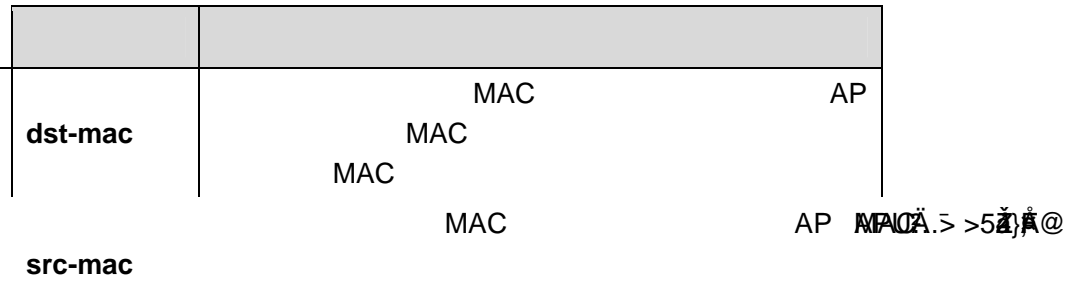
7.1.2 aggr8Wateport load-balance

AP

no

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

no aggregateport load-balance



| | |
|--|---------------|
| show aggregateport load-balance | 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 |
| load-balance | aggeregaye port |
| summary | aggregate port |

aggregate port

aggregate port

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

| | |
|-----------------------------------|----|
| | |
| aggregateport load-balance | AP |

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

”

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

Ruijie(config-if)# **lacp port-priority 4096**

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

8.1.2 port-group mode

LACP ID no
LACP

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

no port-group

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

LACP

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

| | |
|---------------------------|------|
| | |
| lacp port-priority | LACP |

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

8.1.3 lacp port-priority

LACP no

lacp port-priority *port-priority*

no lacp port-priority

LACP

LACP



port-group *key*



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 | | | | |
| LACP Port Priority | | sup | | | | |
| Oper Key | | LACP | | | | |
| Port Number | | Key | | | | |
| Port State | | LACP | | | | |
| Partner information | | LACP | | | | |
| Dev ID | | MAC | | | | |

| | | | |
|----------------------------|--|------|----|
| port-group key mode | | LACP | ID |
|----------------------------|--|------|----|

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

9 VLAN

9.1

9.1.1 vlan

VLAN

VLAN

no

vlan *vlan-id*

no vlan *vlan-id*

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

G5B8 5B5g8

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
```

10.5

| | |
|---------|------|
| | |
| sh vlan | VLAN |

1.1.3 switch port mode

switch port access VLAN
switchport access vlan VLAN

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

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

| | |
|--------------------------|-------------------------------------|
| | |
| switchport access | statics accessport VLAN |
| switchport trunk | 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
    
```

| | |
|-------------------------|-------------------------------------|
| | |
| switchport mode | switch port |
| switchport trunk | 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 ID VLAN |
| | ID - 10-20 |
| | , |
| | 1-10,20-25,30,33 |
| allowed vlan vlan-list | all VLAN |
| | VLAN |
| | add VLAN VLAN |
| | remove VLAN VLAN |
| | except VLAN |
| | VLAN VLAN |
| native vlan vlan-id | Native VLAN |

VLAN all Native VLAN VLAN 1

Native VLAN

```

Trunk                                      native VLAN                      native VLAN
                                          UNTAG                                      VLAN
VLAN    VLAN ID                      VLAN ID    IEEE 802.1Q                      PVID                      native
                                          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

```

| | |
|--------------------------|----------------------------|
| | |
| show interfaces | |
| switchport access | 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
```

| name | VLAN |
|-------------|------|

10 Super-vlan

10.1

10.1.1 supervlan

VLAN **supervlan**

supervlan
no supervlan

VLAN

end **Ctrl+C**

exit

```
Ruijie(config)# vlan 3
Ruijie(config-vlan)# supervlan
```

| | |
|-----------------------|-----------|
| | |
| show supervlan | supervlan |

10.1.2 subvlan

super vlan subvlan subvlan

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

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

VLAN

no subvlan supevlan subvlan

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

| | |
|-----------------------|-----------|
| | |
| show supervlan | supervlan |

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
```



show supervlan

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

add k

IP

VLAN

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

12.1.2 private-vlan association

secondary VLAN primary VLAN

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

no private-vlan association

svlist secondary VLAN list

no primary VLAN secondary VLAN

Primary VLAN

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

```
Ruijie(config-vlan)# private-vlan association add  
24-26
```

show vlan private-vlan

RGOS10.1

12.1.3 private-vlan mapping

secondary VLAN SVI

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

no private-vlan mapping

svlist secondary VLAN list

no

Primary VLAN

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

show vlan private-vlan

RGOS10.1

12.1.4 switchport mode private-vlan

private VLAN

switchport mode private-vlan{host|promiscuous}
no switchport mode

| | |
|--------------------|------|
| host | VLAN |
| promiscuous | VLAN |
| no | VLAN |

```
Ruijie(config)# interface gigabitEthernet0/2  
Ruijie(config-if)# switchport mode private-vlan host
```

show vlan private-vlan

RGOS10.1

12.1.5 switchport private-vlan host-association

| | |
|----------------|--------------|
| private VLAN | primary VLAN |
| secondary VLAN | |

switchport private-vlan host-association *p_vid s_vid*

no switchport private-vlan host-association

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 |
| no | 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

show vlan private-vlan

12.2.1 show vlan private-vlan

private VLAN

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

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

RGOS10.1

12.3.2 switchport hybrid native vlan

```
switchport hybrid native vlan vid
```

```
no switchport hybrid native vlan
```

```
hybrid          vlan
```

```
no          hybrid    VLAN
```

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

RGOS10.1

12.3.3 switchport hybrid allowed vlan

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

```
no switchport hybrid allowed vlan
```

```
hybrid
```

```
no          hybrid
```

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

RGOS10.1

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)#switchport dot1q-tunnel allowed vlan
tagged 3-6
ruijie(config)#end
```

```
show interface dot1q-tunnel
```

```
RGOS10.3
```

13.1.4 switchport dot1q-tunnel native vlan

```
dot1q-tunnel m
```

```
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 vid register inner-vid v_list
```

v_list vlan id

vid vlan id

no

```
tag      vid 4-22      tag      vid 3

ruijie#configure
ruijie(config)#interface gigabitEthernet 0/1
ruijie(config-if)#switchport mode dot1q-tunnel
ruijie(config-if)#dot1q outer-vid 3 register inner-vid
4-22
ruijie(config-if)#end
```

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

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)# 15j/1 1 13.9771 -D( 1.1.-24 -1.44jie(config/4.8 0 1
```

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)#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# show dot1q-tunnel
Ports   Dot1q-tunnel
-----  -
Gi0/1   Enable
```

RGOS10.3

13.2.2 show interface dot1q-tunnel

dot1q-tunnel

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

intf-id

```
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

13.2.4 show inner-priority-trust

show inner-priority-trust

```
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
```

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
```

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

14.1.2 clear mac-address-table dynamic

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

| dynamic | |
|--------------------------------------|------|
| address <i>mac-addr</i> | |
| interface <i>interface-id</i> | |
| vlan <i>vlan-id</i> | VLAN |

show mac-address-table dynamic

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

| | |
|---------------------------------------|--|
| | |
| show mac-address-table dynamic | |

14.1.3 clear mac-address-table filtering

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

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

show mac-address-table filtering

00d0.f800.0c0c

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

| | |
|--|--|
| | |
| <u>mac-address-table filtering</u> | |
| show mac-address-table filtering | |

14.1.4 clear mac-address-table static

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

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

show mac-address-table static

MAC 00d0.f800.073c

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

| | |
|--------------------------------------|--|
| | |
| mac-address-table static | |
| show mac-address-table static | |

14.1.5 max-dynamic-mac-count

VLAN

no

max-dynamic-mac-count <*address-number*>

| | |
|-----------------------|------|
| | |
| <i>address-number</i> | VLAN |

MAC

VLAN
MAC

VLAN

```

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

```

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

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

show mac-address-table filtering

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

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

14.1.8 mac-address-table notification

MAC

no

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

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

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

1

50

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

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

snmp-server enable traps

trap

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

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

14.1.10 address-bind ip-address

```
ip address mac .
```

```
address-bind ip-address mac-address
```

```
no address-bind ip-address
```

| | |
|-------------|-------|
| | ' |
| ip-address | ' ID |
| mac-address | ' aUW |

```
IP          IP          MAC
IP          IP          MAC          IP
MAC
```

```
ip address 3.3.3.3 mac 00d0.f811.1112
```

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

| | |
|-------------------|---|
| ' | ' |
| show address-bind | ' |

14.1.11 address-bind uplink

ip mac .

address-bind uplink *intf-id*

no address-bind uplink *intf-id*

| | |
|----------------|---|
| | |
| <i>intf-id</i> | ' |

IP IP MAC
 IP IP MAC IP
 MAC
 (address-bind install)

fa 0/1

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

| | |
|---------------------------------|--|
| | |
| show address-bind uplink | |

RGOS10.1

14.1.12 address-bind install

/

address-bind install

no address-bind install

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

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

```

14.1.15 mac-manage-learning uniform learning-synchronization

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

uniform no MAC MAC

| | |
|---|-----|
| | |
| show mac-address-table mac-manage-learning | MAC |

14.1.16 mac-manage-learning dispersive

MAC dispersive .

MAC dispersive
 MAC

| | |
|---|-----|
| | |
| show mac-address-table mac-manage-learning | MAC |

14.2

- ' **show mac-address-table address**
- ' **show mac-address-table aging-time**
- ' **show mac-address-table count**
- ' **show mac-address-table dynamic**
- ' **show mac-address-table filtering**
- ' **show mac-address-table interface**
- ' **show mac-address-table notification**
- ' **show mac-address-table static**
- ' **show mac-address-table vlan**
- ' **show address-bind**
- ' **show mac-address-table mac-manage-learning**

14.2.1 show mac-address-table address

MAC

show mac-address-table

MAC

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

| | |
|---|--|
| | |
| show mac-address-table static | |
| show mac-address-table filtering | |
| show mac-address-table dynamic | |
| show mac-address-table address | |
| show mac-address-table interface | |

```
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 |

| | |
|--|--|
| | |
| clear mac-address-table dynamic | |

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 |

14.2.7 show mac-address-table notification

MAC

show mac-address-table notification [**interface***[interface-id]* |
history]

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

MAC

```
Ruijie# show mac-address-table notification interface
Interface          MAC Added Trap  MAC Removed Trap
-----
GigabitEthernet1/14  Disabled          Disabled
```

```
Ruijie# show mac-address-table notification
MAC Notification Feature : Disabled
Interval between Notification Traps : 1 secs
Maximum Number of entries configured in History Table :1
Current History Table Length : 0
```

```
Ruijie# show mac-address-table notification history
History Index : 0
MAC Changed Message :
Operation:ADD Vlan : 1 MAC Addr: 00f8.d012.3456
GigabitEthernet 3/1
```

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

14.2.8 show mac-address-table static

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

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

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

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

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

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

```
Ruijie# show mac-address-table vlan 1
Vlan    MAC Address      Type      Interface
-----  -
1       00d0.f800.1001  STATIC   gigabitethernet 1/1
1       00d0.f800.1002  STATIC   gigabitethernet 1/1
1       00d0.f800.1003  STATIC   gigabitethernet 1/1
```

| show mac-address-table static | |
|---|--|
| show mac-address-table filtering | |
| show mac-address-table dynamic | |
| show mac-address-table address | |
| show mac-address-table interface | |
| show mac-address-table count | |

14.2.10 show address-bind

show address-bind

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

3.3.3.4 00d0.f811.1117

| | |
|--------------|--|
| | |
| address-bind | |

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.
```

| | |
|--|-------------------|
| | |
| mac-manage-learning uniform | MAC uniform |
| mac-manage-learning uniform learning-synchronization | MAC |
| mac-manage-learning dispersive | 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
DHCP snooping
show ip dhcp snooping
```

```
r . . .
DHCP Snooping Private VLAN . . .
```

DHCP snooping

| | |
|------------------------------|---------------|
| | |
| show ip dhcp snooping | DHCP snooping |

15.1.4 ip dhcp snooping verify mac-address

MAC

no

MAC

[no] ip dhcp snooping verify mac-address

```

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)
-----
    
```

| | |
|------------------------------|---------------|
| | |
| show ip dhcp snooping | 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
    
```

FLASH

DHCP Snooping

FLASH

IP

flash 3600

```
Ruijie# configure terminal
```

```
Ruijie(config)# ip dhcp snooping database write-delay  
3600
```

```
Ruijie(config)# end
```

```
Ruijie# show ip dhcp snooping
```

```
Switch DHCP snooping status  ENABLE
```

DHCP

flash

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

15.2 DHCP snooping

DHCP snooping

- ' **ip dhcp snooping suppression**
- ' **ip dhcp snooping trust**
- ' **ip dhcp snooping limit rate**

15.2.1 ip dhcp snooping suppression

suppression

no

no suppression

[no] ip dhcp snooping suppression

DHCP

DHCP

fastethernet 0/2 suppression

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

15.2.2 ip dhcp snooping trust

DHCP snooping

no

TRUST

UNTRUST

[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 Bootp bind status: ENABLE
Interface           Trusted      Rate limit (pps)
-----
FastEthernet0/1    YES         unlimited
    
```



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

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)
-----
```

| | |
|--|---------------------|
| | |
| ip dhcp snooping | DHCP snooping |
| ip dhcp snooping verify mac-address | DHCP snooping mac |
| ip dhcp snooping write-delay | flash |
| ip dhcp snooping information option | DHCP option82 |
| ip dhcp snooping bootp-bind | DHCP Snooping Bootp |
| ip dhcp snooping trust | DHCP snooping trust |

15.3.2 show ip dhcp snooping binding

DHCP Snooping

show ip dhcp snooping binding

DHCP Snooping

```
Ruijie# show ip dhcp snooping binding
Total number of bindings: 1
MacAddress      IpAddress Lease Type VLAN Interface
-----
00d0.f801.0101 192.168.1.1 - static 1 fastethernet 0/1
```

| ip dhcp snooping binding | DHCP snooping |
|---------------------------------------|---------------|
| clear ip dhcp snooping binding | DHCP snooping |

15.4 DHCP snooping

DHCP Snooping

- ' **clear ip dhcp snooping binding**
- ' **debug ip dhcp snooping**

15.4.1 clear ip dhcp snooping binding

DHCP Snooping

clear ip dhcp snooping binding

DHCP snooping

DHCP snooping

```
Ruijie# clear ip dhcp snooping binding
```

```
Ruijie# show ip dhcp snooping binding
```

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

'

no ip igmp profile *profile-number*



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**

| | |
|------------------------|----------------|
| | |
| ip igmp profile | profile |
| deny | profile deny |
| permit | profile permit |

16.1.3 deny

profile profile
 deny
deny

profile deny

profile

profile range

233.3.3.3 profile :

```
Ruijie(config)# ip igmp profile 1
Ruijie(config-profile)# range 233.3.3.3
Ruijie(config-profile)# deny
```

| | |
|------------------------|---------|
| | |
| ip igmp profile | profile |
| range | |

16.1.4 permit

```

profile
permit
permit

profile deny

profile

profile
profile
profile
profile
range
234.4.4.4 profile :

Ruijie(config)# ip igmp profile 1
Ruijie(config-profile)# range 234.4.4.4
Ruijie(config-profile)# permit
```

| | |
|------------------------|---------|
| | |
| ip igmp profile | profile |
| range | |

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

```

| ip igmp snooping svgl | igmp snooping svgl |
|-----------------------------------|--------------------|
| ip igmp snooping ivgl-svgl | 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

```

disable

VLAN Shared VLAN VLAN Shared VLAN VLAN Shared VLAN SVGL
IGMP Profile Shared VLAN SVGL
SVGL VLAN

/
SVGL profile SVGL
SVGL
SVGL
SVGL
ip multicast-routing
SVGL

igmp snooping SVGL profile1
SVGL

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

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



ip ii[(igmp sno2.ing svsn2.gl pro).64(i/TT9 1 Tf6.6343 0f0()T.16 TD()TjET44a41j/

SVGL

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

ip igmp snooping profile *profile-number*

no ip igmp snooping profile

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

profile

IGMP Snooping

SVGL

IVGL-SVGL

SVGL

profile

VLAN

SVGL

VLAN

profile

VLAN

SVGL

profile 1

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

| | | |
|-----------------------------------|---------------|------|
| | | |
| ip igmp snooping svgl | igmp snooping | svgl |
| ip igmp snooping ivgl-svgl | igmp snooping | |

16.1.8 ip igmp snooping ivgl-svgl

igmp snooping

IVGL-SVGL

ip igmp snooping ivgl-svgl

no igmp

snooping

ip igmp snooping ivgl-svgl
no ip igmp snooping

disable

| | | | | | |
|------|------|--------------|--|------|------|
| | IVGL | SVGL | | IVGL | SVGL |
| | | IGMP Profile | | | |
| SVGL | | | | | VLAN |

VLAN
ip igmp snooping vlan igmp snooping no ip igmp snooping vlan vlan
 igmp snooping

ip igmp snooping vlan *num*
no ip igmp snooping vlan *num*

| | |
|------------|-------------------------------|
| | |
| <i>num</i> | VLAN IGMP Snooping VLAN ID |

VLAN

VLAN IGMP Snooping

igmp snooping IVGL
 Ruijie(config)#**no ip igmp snooping vlan 100**

| | |
|-----------------------------------|--------------------|
| | |
| ip igmp snooping ivgl | igmp snooping svgl |
| ip igmp snooping ivgl-svgl | igmp snooping |

16.1.10 ip igmp snooping dyn-mr-aging-time

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

| | |
|------------|--------|
| | |
| <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

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

num

```

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

```

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

```

VLAN
VLAN
no

```


| | |
|--|--|
| ip igmp snooping vlan mrouter interface | |
|--|--|

16.1.15 ip igmp snooping fast-leave enable

```

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

```

```

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

```

disable

```

IGMP                                     IP
                                     IP      IGMP

```

```

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

```

16.1.16 ip igmp snooping suppression enable

```

    igmp snooping suppression          ip igmp
snooping suppression enable         no      igmp snooping
suppression

```

```

ip igmp snooping suppression enable
no ip igmp snooping suppression enable

```

disable

IGMP
vlan
Report IGMP Report IGMP
suppression IGMPv1/v2 report
IGMPv3 report
igmp snooping suppression
Ruijie(config)# ip igmp snooping suppression

16.1.17 ip igmp snooping source-check port

```
igmp  
ip igmp  
snooping  
snooping source-check port no  
ip igmp snooping source-check port  
no ip igmp snooping source-check port
```

IGMP SNOOPING

IGMP

IGMP Sooping
IGMP SNOOPING

VLAN

igmp snooping

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

| | |
|---|----|
| | |
| ip igmp snooping source-check default-server | 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 1
address 233.3.3.3 server 1.1.1.2
```

| | |
|------------------------------------|----|
| | |
| ip igmp snooping | IP |
| source-check default-server | IP |

16.1.20 ip igmp snooping filter

profile no profile

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

| | |
|-----------------------|-----------|
| | |
| <i>Profile-number</i> | profile . |

```

IGMP Profile
Report IGMP
Profile IGMP

profile filter

0/1 profile 1
```

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

| | |
|-----------------|---------|
| | |
| ip igmp profile | profile |

16.1.21 ip igmp snooping max-groups

```

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

Number: 0 – 1024

bèL\$ Ä

y ´r T õaN0 @

HÁ,RT7a´Sx/EäÖí ACE Dz1¼ !ÇH Sm Ú v : 4rt

ó,RÜG5B

10Ckújie(config)#()Tj /TTT5 1 Tf 9.1 0

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 |
| gda-table | |
| interfaces | filter max-group |
| mrouter | |
| statistics | 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*



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 |
|----------------|---------------|
| event | IGMP Snooping |
| packet | IGMP Snooping |
| msf | IGMP Snooping |
| warning | IGMP Snooping |

EXEC

17 PIM-Snooping

17.1 PIM-Snooping

```
no PIM-Snooping ip pim snooping
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

18 MSTP

18.1

18.1.1 spanning-tree

```

MSTP          no          MSTP          MSTP
                spanning-tree          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** **max-age**

$2 * (\text{Hello Time} + 1.0\text{snd}) \leq \text{Max-Age Time} \leq 2 * (\text{Forward-Delay} - 1.0\text{snd})$

spanning-tree

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

BridgeForwardDelay

Ruijie(config)# **spanning-tree forward-time 10**

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

18.1.2 spanning-tree bpdudfilter

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

enabled             BPDU filter
Disabled           BPDU filter
```

MSTP

no spanning-tree max-hops

hop-count BPDU

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

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** MST

showT

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

```

show spanning-tree mst instance interface interface-id

```

show spanning-tree mst          MSTP
spanning-tree mst cost
spanning-tree mst priority      Instance

```

18.1.10 spanning-tree mst priority

```

Instance          no

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

```

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
```

MSTP

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 root
```

18.1.22 spanning-tree loopguard default

```
loop guard no loop guard  
loop guard bpdu
```

spanning-tree loopguard default

no spanning-tree loopguard default

```
loop guard
```

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

18.1.23 spanning-tree guard loop

```
loop guard no loop guard  
loop guard bpdu
```

spanning-tree guard loop

no spanning-tree guard loop

```
loop guard
```

MSTP

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

show spanning-tree interface STP

18.1.28 **spanning-tree compatible enable**

MSTI

spanning-tree compatible enable
no spanning-tree compatible enable

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

18.1.29 **logging event status**

LOG

logging event status
no logging event status

```
Ruijie(config-if)#logging event status
```

18.2

18.2.1 show spanning-tree

```
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 |
| source interface <i>interface-id</i> | interface-id SVI S8600 AP |
| destination interface <i>interface-id</i> | interface-id SVI S8600 AP |
| both acl name | acl name/id |
| rx | |
| tx | |
| all | |
| switch | |

switch port routed port

SPAN

SPAN
disabled port

SPAN

show monitor

SPAN

SPAN

1.

1

1

8

Ruijie(config)# **no monitor session 1**Ruijie(config)# **monitor session 1 source interface
gigabitEthernet 1/1 both**Ruijie(config)# **monitor session 1 destination interface
gigabitEthernet 1/8**

ruijie>

session 1

| | |
|---------------------|------|
| | |
| show monitor | SPAN |

S8600

4

1

session

128

19.2 show monitor

SPAN

show monitor [session session_number]

SPAN

session session_number 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> | remote span vlan id |
| <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

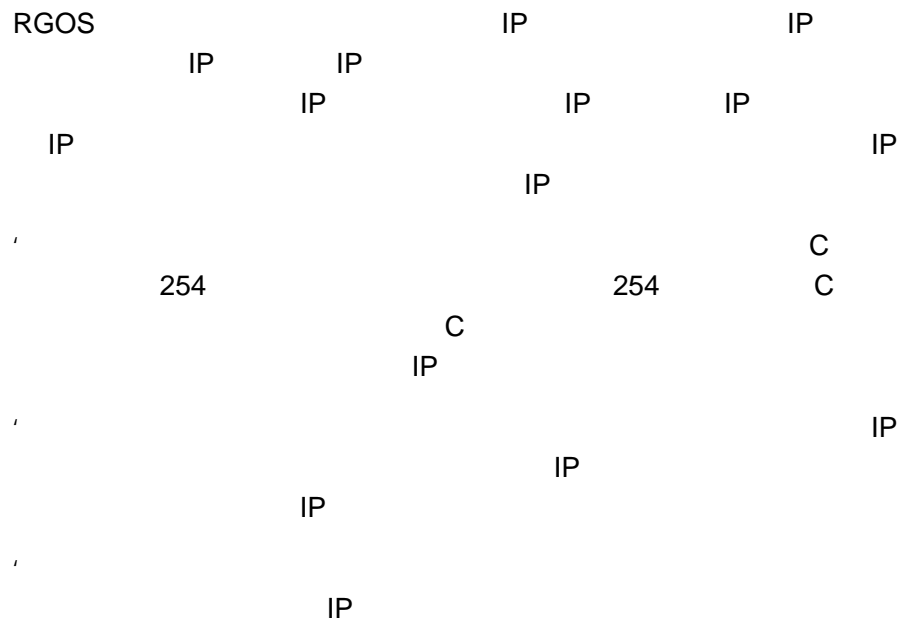
```
end          Ctrl+C
```

```
exit
```

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

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

| | |
|------------------|------|
| | |
| show vlan | Vlan |



```

255.255.255.0
ip address 10.10.10.1 255.255.255.0

```

| | |
|-----------------------|--|
| | |
| show interface | |

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
```

| | |
|-----------------------|--|
| | |
| show interface | |

- ' **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 ]
    
```

| <i>ip-address</i> | MAC | IP | |
|--------------------|-----|------|------|
| <i>MAC-address</i> | | 48 | |
| <i>type</i> | ARP | | arpa |
| alias | arp | RGOS | IP |

ARP

```

RGOS    ARP        32        IP        48
MAC
    
```

```

                ARP                ARP
clear arp-cache                ARP
    
```

```

                ARP
arp 1.1.1.1 4e54.3800.0002 arpa
    
```

IP



clear arp-cache

ARP

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

ARP

ARP
ARP

1000

ARP

arp trusted 1000

| | |
|--|---|
| | , |
|--|---|

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 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 <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
      ARP
            IP      MAC
            ARP
            ARP

```

```

FastEthernet 0/1
120

```

```

interface fastEthernet 0/1
arp timeout 120

```

| | |
|------------------------|-----|
| | |
| clear arp-cache | ARP |
| show interface | |

21.2.9 ip proxy-arp

```

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

```

```

10.2(3)
      ARP

```

```

      ARP
      IP      MAC
      IP      ARP      ARP      IP
      MAC      ARP      MAC
      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>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

- ' **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

r . .

NFPP(Network Foundation Protection Policy,)
mac (IP) 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 |
| static | arp | | |
| complete | | arp | |
| incomplete | | 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 “_” |
| Hardware | IP |
| Type | ARPA |
| Interface | IP |

show arp 192.168.195.68

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

show arp 192.168.195.0 255.255.255.0

```
Ruijie# show arp 192.168.195.0 255.255.255.0
Protocol Address Age(min) Hardware Type
Interface
Internet 192.168.195.64 0 0018.8b7b.9106 arpa
VLAN 1
Internet 192.168.195.2 1 00d0.f8ff.f00e arpa
VLAN 1
Internet 192.168.195.5 -- 00d0.f822.33b1 arpa
VLAN 1
Internet 192.168.195.1 0 00d0.f8a6.5af7 arpa
VLAN 1
Internet 192.168.195.51 1 0018.8b82.8691 arpa
VLAN 1
```

show arp 001a.a0b5.378d

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

21.4.3 show arp counter

ARP arp

show arp counter


```
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 |

IP

192.168.12.0

```
clear ip route 192.168.12.0
```

| | |
|----------------------|----|
| | |
| show ip route | 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 “_” |
| Hardware | IP |
| Type | ARPA |
| Interface | IP |

21.4.8 show ip interface

IP

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

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

RGOS
RGOS
RGOS

UP

UP

show ip interface

```
Ruijie# show ip interface FastEthernet 0/1
IP interface state is: UP
IP interface type is: BROADCAST
IP interface metric is: 0
IP interface MTU is: 1500
```


22 IP

22.1 IP

- IP
- ' ip mask-reply
- ' ip mtu
- ' ip redirects
- ' ip source-route
- ' ip unreachablees

22.1.1 ip mask-reply

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

ICMP

ICMP

ICMP

FastEthernet 0/1

ICMP

```

IP MTU ip mtu
no
ip mtu bytes
no ip mtu
    
```

| | |
|--------------|------------|
| | |
| <i>bytes</i> | IP 68~1500 |

mtu

```

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

```

FastEthernet 0/1 IP MTU 512 ip 045 1 0 Tr4
    
```

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 unreachables

| | | | |
|---------------------------|------|------|-----------|
| RGOS | ICMP | | ip |
| unreachables | no | ICMP | |
| ip unreachables | | | |
| no ip unreachables | | | |

RGOS

ICMP

RGOS

23 DHCP

23.1 DHCP

23.1.1 bootfile

```

DHCP                               DHCP
bootfile        no
bootfile <i>file-name</i>
no bootfile
    
```

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

DHCP

```

DHCP                               DHCP
                                     DHCP
TFTP                                next-server
    
```

router.conf

```
bootfile router.conf
```

| | |
|---------------------|--------------------|
| | |
| ip dhcp pool | DHCP DHCP |

next-server

DHCP

| | |
|-------------------------|--------------|
| | |
| hardware-address | DHCP |
| host | IP DHCP |
| ip dhcp pool | DHCP DHCP |

23.1.3 client-name

DHCP DHCP client-name
no DHCP

client-name *client-name*
no client-name

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

DHCP

DHCP DHCP

river

client-name river

| | |
|-------------|------------|
| | |
| host | IP DHCP |

| | |
|---------------------|--------------|
| ip dhcp pool | DHCP DHCP |
|---------------------|--------------|

23.1.4 default-router

DHCP
default-router **no** DHCP
default-router *ip-address* [*ip-address2*...*ip-address8*]
no default-router

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

DHCP

 DHCP DHCP DHCP IP

 192.168.12.1
 default-router 192.168.12.1

| | |
|---------------------|--------------|
| | |
| ip dhcp pool | DHCP 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
```

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

| | |
|---------------------|--------------------------------|
| | |
| dns-server | DHCP DNS |
| ip dhcp pool | DHCP DHCP |

23.1.7 hardware-address

DHCP

DHCP

hardware-address no

hardware-address *hardware-address type*

no hardware-address

| | |
|-------------------------|---------------|
| | |
| <i>hardware-address</i> | DHCP MAC |

DHCP

±

type

| | |
|-------------------|---------|
| | |
| <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

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

client-identifier

DHCP

RGOS

DHCP

IP

DHCP DHCC /TT3 1 Tf 3.08 728

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`

| | |
|---------------------|-----------|
| | |
| ip dhcp pool | DHCP DHCP |
| network DHCP | DHCP |

23.1.11 ip dhcp force-send-nak

DHCP NAK
 no NAK

ip dhcp force-send-nak
no ip dhcp force-send-nak

RFC2131 DHCP Request
 NAK IP Request
 IP IP
 DHCP NAK DHCP
 DHCP

| | | | |
|------|------|----|------|
| DHCP | DHCP | IP | ping |
|------|------|----|------|

| | | | |
|----|------|------|--|
| 10 | DHCP | Ping | |
|----|------|------|--|

| | | | |
|--|------|---|--|
| | ping | 3 | |
|--|------|---|--|

ip dhcp ping packets 3

ping

600ms

```
ip dhcp ping timeout 600
```



| | |
|---------------------------------|---------|
| | |
| host | IP DHCP |
| ip dhcp excluded-address | DHCP IP |
| network DHCP | DHCP |

23.1.15 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

| | |
|---------------------|-----------|
| | |
| ip dhcp pool | DHCP DHCP |

23.1.16 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

4G!5Bã

WINS

| | |
|------------------------|-----|
| | |
| ip address dhcp | v0ã |

23.1.17 netbios-node-type

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

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

| <i>type</i> | NetBIOS 0~FF ± 1 b-node ± 2 p-node ± 4 m-node ± 8 h-node ± b-node ± p-node ± m-node ± h-node |
|-------------|---|

NetBIOS

DHCP

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

| | | |
|------|---------|--------|
| WINS | | WINS |
| | NetBIOS | Hybrid |

DHCP NetBIOS

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

| ip dhcp pool | DHCP DHCP |
|----------------------------|-------------------|
| netbios-name-server | WINS DHCP NETBIOS |

23.1.18 network DHCP

```

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

```

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

```
DHCP
```

```
DHCP
```

```

DHCP
DHCP

```

```
23j /TT3 1 Tf 2 Tr -18.06 TD 0.0057 Tc 234>5.7<04446c
```

```
network 192.168.12.0 255.255.255.240
```

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

23.1.19 next-server

DHCP

DHCP

next-server**no**

```
next-server ip-address [ ip-address2...ip-address8 ]
```

```
no next-server
```

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

DHCP

DHCP

DHCP

192.168.12.4

```
next-server 192.168.12.4
```

| bootfile | DHCP |
|-----------------|------|

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

23.1.20 option

```

DHCP
no
DHCP
option
option

```

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

no option

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

```

DHCP
DHCP
option
DHCP
DHCP
DHCP
DHCP option
RFC 2131
19
IP 0
DHCP
IP 1
DHCP
IP
8)

```

```

172.16.12.0      192.168.12.12  2      172.16.16.0
192.168.12.16

option 33 ip 172.16.12.0 192.168.12.12 172.16.16.0
192.168.12.16
    
```

| | |
|---------------------|--------------|
| | |
| ip dhcp pool | DHCP DHCP |

23.1.21 service dhcp

```

DHCP
dhcp no DHCP service
service dhcp
no service dhcp
    
```

DHCP

```

DHCP IP DNS
DHCP DHCP DHCP DHCP
DHCP
DHCP
    
```

service dhcp

| | |
|---------------------------------------|------|
| | |
| show ip dhcp server statistics | DHCP |

23.2

- ' clear ip dhcp binding
- ' clear ip dhcp conflict
- ' clear ip dhcp server statistics
- ' debug ip dhcp client
- ' debug ip dhcp server
- ' show dhcp lease
- ' show ip dhcp binding
- ' show ip dhcp conflict
- ' show ip dhcp server statistics

23.2.1 clear ip dhcp binding

DHCP

clear ip dhcp binding

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

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

```

DHCP          DHCP          no ip
dhcp pool

```

```

IP          192.168.12.100  DHCP
clear ip dhcp binding 192.168.12.100

```

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

| |
|-----------------------------|
| show ip dhcp binding |
|-----------------------------|

| |
|------|
| DHCP |
|------|

23.2.2 clear ip dhcp conflict

DHCP

clear ip dhcp conflict

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

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

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

show ip dhcp binding

```

Ruijie# show ip dhcp binding
IP address      Client-Id/      Lease expiration  Type
  
```

| | | | |
|-------------|------------------|------|--------|
| | Hardware address | | |
| 192.168.1.2 | 00d0.f866.4777 | IDLE | Manual |

| | | |
|--------------------------------|------|-------------------|
| | | |
| IP address | DHCP | IP |
| Client-Id/ Hardware address | DHCP | client identifier |

| | |
|------------------|----------|
| | Infinite |
| Lease expiration | IDLE |

DHCP

```
dhcpd excluded ipaddress  
192.168.12.100
```



DHCP

| | |
|-------------|-----|
| DHCPREQUEST | 25 |
| DHCPDECLINE | 0 |
| DHCPRELEASE | 1 |
| DHCPINFORM | 150 |

| Message | Sent |
|-----------|------|
| BOOTREPLY | 16 |
| DHCPOFFER | 9 |
| DHCPACK | 7 |
| DHCPNAK | 0 |

R

...

...

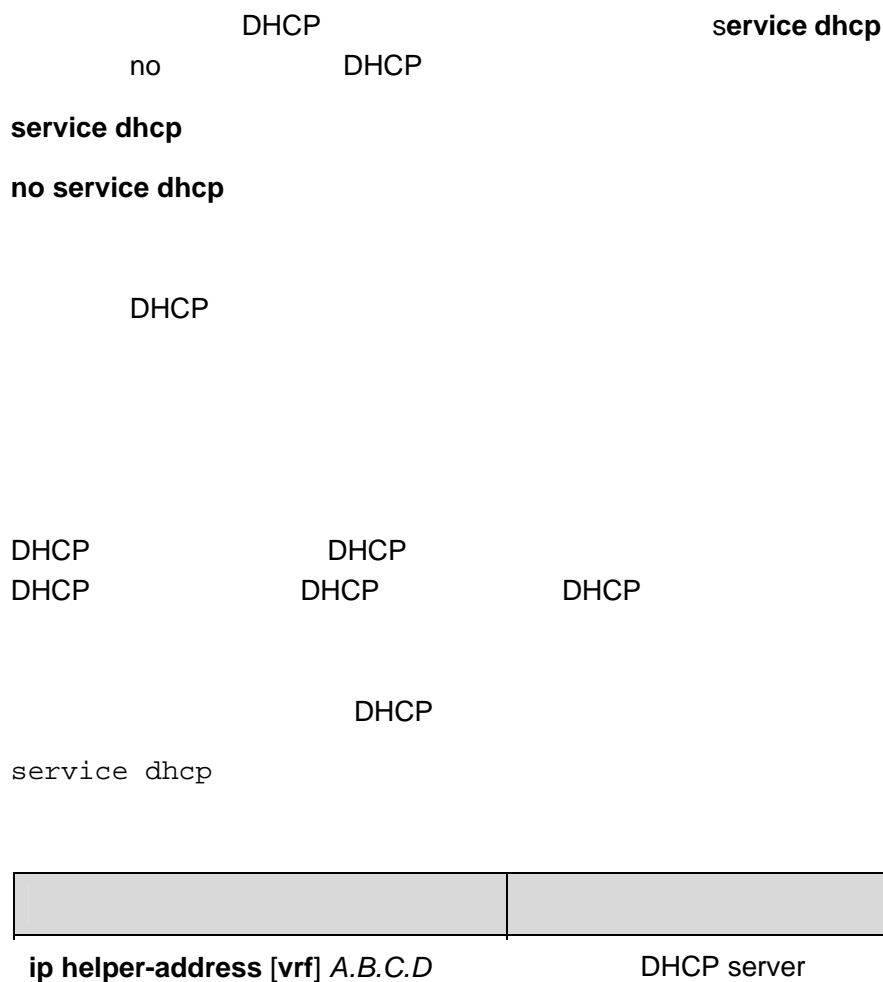
24 DHCP Relay

24.1 DHCP Relay

DHCP

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

24.1.1 service dhcp



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

| service dhcp | DHCP |
|--|------------------|
| ip dhcp relay information option dot1x access-group | 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

option dot1x

Ip dhcp relay information option82

| | |
|---|-------------------|
| | |
| Service dhcp | DHCP |
| ip dhcp relay information option dot1x | 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

| | |
|---------------------|------|
| | |
| Service dhcp | 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)#
    
```

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

25 DNS

25.1

25.1.1 ip domain-lookup

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

```

DNS Server IP DNS
Server Server
Server DNS
        6 DNS Server ip-address
                        DNS
    
```

```
Ruijie(config)# ip name-server 192.168.5.134
```

| | |
|-------------------|-----|
| | |
| show hosts | DNS |

25.1.3 ip host

```
IP no
```

```
ip host host-name ip-address
```

```
no ip host host-name ip-address
```

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

no ip host host-name ip-address

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

| | |
|-------------------|-----|
| | |
| show hosts | DNS |

25.1.4 clear host

clear host [*host-name*]

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

```
DNS                                1    ip host    2
                                   DNS
```

-IP

```
clear host *
```

| | |
|-------------------|--|
| | |
| show hosts | |

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
```

| ip host | IP |
|-----------------------|-----|
| ip name-server | 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**

| show sntp | SNTP |
|------------------------------|------|
| clock update-calendar | |
| clock set | |

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

| | |
|--------------------|------|
| | |
| show sntp | SNTP |
| sntp enable | SNTP |

RGOS10.0

26.1.3 sntp interval

SNTP Client NTP/SNTP Server

sntp interval

1800s

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

| | |
|------------------------------|------|
| | |
| sntp enable | SNTP |
| show sntp | SNTP |
| clock update-calendar | |

RGOS10.0

ruijie>

sntp enable

26.2

:

show sntp

26.2.1 show sntp

SNTP

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

| | |
|-------------------|-----|
| | |
| ntp server | NTP |

27.1.2 ntp access-group

NTP

no

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

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

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

peer

NTP

peer

serve serve-only query-only

r . .

1

2

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

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

| | |
|-----------------------|----|
| | |
| ip access-list | IP |

27.1.3 ntp authenticate

NTP

NTP

ntp authenticate

no ntp authenticate

NTP

ntp authentication-key ntp trusted-key

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

| ntp authentication-key | |
|-------------------------------|--|
| ntp trusted-key | |

27.1.4 ntp authentication-key

NTP

NTP

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

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

| <i>key-id</i> | ID |
|-------------------|-----|
| <i>key-string</i> | |
| <i>enc-type</i> | 7 0 |

md5 key-id
ntp trusted-key key-id

1024

ID 6

ntp authentication-key 6 md5 woooooop

| | |
|-------------------------|-----|
| | |
| ntp authenticate | |
| ntp trusted-key | |
| ntp server | NTP |

27.1.5 ntp disable

NTP

ntp disable

NTP

NTP

NTP

r

IP

NTP

no ntp

27.1.6 ntp master

NTP

no

NTP

ntp master [*stratum*]**no ntp master**

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

NTP

r

```
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
```

NTP
IP

NTP

NTP server

IPv4 Ruijie(config)# ntp server 192.168.210.222



| | |
|-------------------------------|-----|
| ntp authenticate | |
| ntp authentication-key | NTP |
| ntp server | 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**

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

UDP

```

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

UDP :

```
Ruijie(config)# udp-helper enable
```

| | |
|----------------------------|-----|
| | |
| ip forward-protocol | UDP |

28.1.2 ip helper-address

UDP

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

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

UDP

20
 , UDP-Helper
 UDP

no ip helper-address

UDP

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

| | |
|----------------------------|-----|
| | |
| ip forward-protocol | 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 |
| tftp | Trivial File Transfer Protocol(69) UDP 69 |
| domain | Domain Name System(53) UDP 53 |
| time | Time service(37) UDP 37 |
| netbios-ns | NetBIOS Name Service(137) UDP 137 |
| netbios-dgm | NetBIOS Datagram Service(138) UDP 138 |
| tacacs | TAC Access Control System(49) UDP 49 |

UDP

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

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

| | |
|----------------------------|-----|
| | |
| udp-helper enable | UDP |
| ip forward-protocol | UDP |

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                                     snmp-server
chassis-id                               no
snmp-server chassis-id text
no snmp-server chassis-id
```

text

60FF60

SNMP

show snmp

SNMP 123456

Ruijie(config)# **snmp-server chassis-id 123456**



SNMP

i-net800@i-net.com.cn

```
Ruijie(config)# snmp-server contact i-net800@i-net.com.cn
```

| show snmp-server | SNMP |
|------------------|------|
| no snmp-server | SNMP |

29.1.5 snmp-server enable traps

SNMP NMS Trap

snmp-server enable traps

no SNMP NMS Trap

snmp-server enable traps [snmp]**no snmp-server enable traps****snmp SNMP****snmp-server**

SNMP

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

| | |
|-------------------------|------|
| | |
| snmp-server host | 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

SNMP

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

| | |
|--------------------------|--|
| | |
| snmp-server enable traps | |

29.1.7 snmp-server location

SNMP

snmp-server

```
location no SNMP
```

```
snmp-server location text
```

```
no snmp-server location
```

```
text
```

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

| | |
|--------------------|------|
| | |
| snmp-sever contact | SNMP |

29.1.8 snmp-server packetsize

SNMP

snmp-sever

```
packetsize no
```

```
snmp-server packetsize byte-count
```

```
no snmp-server packetsize
```

byte-count 484 17876

1500

SNMP 1492

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

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

| | |
|-------------------------------|------|
| | |
| snmp-server packetsize | SNMP |

29.1.10 snmp-server system-shutdown

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

SNMP

SNMP

RGOS

SNMP IP
SNMP IP
0 IP SNMP

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

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

| | |
|---------------------------------|-----|
| | |
| snmp-server queue-length | |
| snmp-server enable host | 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
no

snmp-server group groupname {v1 | v2c | v3 {auth | noauth | priv}}
[read readview][write writeview] [access {num | name}]

no snmp-server group groupname {v1 | v2c | v3 }

v1 | v2c |v3      SNMP

auth              v3

noauth            v3

priv              v3

readview

writeview

```

```

Ruijie(config)# snmp-server group mib2user v3 priv read
mib2

```

| | |
|-----------------|------|
| | |
| show snmp group | SNMP |

29.1.15 snmp-server view

```

SNMP
no

snmp-server view view-name oid-tree {include | exclude}

no snmp-server view view-name [oid-tree]

```

view-name

oid-tree MIB MIB

include MIB

exclude MIB

default

| | |
|-----------------|--|
| | |
| show run | |

29.2

29.2.1 show snmp

SNMP

show snmp

show snmp [mib |

SNMP

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

| snmp-server <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
```

30.1.1 rmon collection stats

no

```
rmon collection stats index [owner owner-string]
```

```
no rmon collection stats index
```

1

```
Ruijie(config)# interface fast-Ethernet 0/1  
Ruijie(config-if)# rmon collection stats 1 zhansan
```

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

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 collection stats <i>index</i> [owner owner-name] | |

30.1.3 rmon alarm

MIB

no

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

trap

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

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

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

30.2.2 show rmon history

show rmon history

```

Ruijie# show rmon history
Entry : 1
Data source : Gi1/1
Buckets requested : 65535
Buckets granted : 10
Interval : 1
Owner : zhangsan
Sample : 198
Interval start : 0d:0h:15m:0s
DropEvents : 0
Octets : 67988
    
```

```

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

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

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

| | |
|---|--|
| | |
| rmon alarm <i>number variable interval</i> { absolute delta } rising-threshold <i>value</i> [<i>event-number</i>] falling-threshold <i>value</i> [<i>event-number</i>] [owner <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
Startup alarm : 3
Rising threshold : 10
Falling threshold : 22
Rising event : 0
Falling event : 0
Owner : zhangsan
```

| | |
|--|--|
| rmon event <i>number</i> [log] [trap <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

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
```

| ip flow-aggregation cache | |
|---|--|
| cache | |
| export destination (aggregation cache) | |
| mask (IPv4) | |
| show ip flow cache aggregation | |

'%%) **export**

IPFIX **export**
no

export {

| | |
|---|--|
| export destination (aggregation cache) | |
| mask (IPv4) | |
| show ip flow cache aggregation | |

31.1.6 flow-sampler

no

flow-sampler *sampler-map-name* [**egress**]

no flow-sampler *sampler-map-name* [**egress**]

sampler-map-name

egress

egress

ingress

egress

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
```

| | |
|-------------------------------|--|
| | |
| flow-sampler-map | |
| mode random one-out-of | |

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
```

| | |
|-------------------------------|--|
| | |
| flow-sampler | |
| mode random one-out-of | |

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
```

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

export destination

(aggregation cache) P # • Ä r T ! m

| | |
|-------------|--|
| mask (IPv4) | |
|-------------|--|

31.1.9 ip flow ingress

ip flow ingress

no

ip flow ingress

no ip flow ingress

ip flow egress IPFIX
ip flow ingress IPFIX

1/1 IP

Ruijie(config)# **interface** gigabitEthernet 1/1
Ruijie(config-if)# **ip flow ingress**

| | |
|---|--|
| | |
| ip flow-aggregation cache | |
| cache | |
| export destination (aggregation cache) | |
| mask (IPv4) | |

31.1.10 ip flow-aggregation cache

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

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

prefix

enabled

no enabled

destination-prefix

0xFFFF0000

Ruijie(config)# **ip flow-aggregation cache**

destination-prefix

Ruijie(config-flow-cache)# **mask destination minimum 16**

Ruijie(config-flow-cache)# **enabled**

source-prefix

0xFFFF0000

Ruijie(config)# **ip flow-aggregation cache**

source-prefix

Ruijie(config-flow-cache)# **mask source minimum 16**

Ruijie(config-flow-cache)# **enabled**

protocol-port

Ruijie(config)# **ip flow-aggregation cache**

protocol-port

Ruijie(config-flow-cache)# **export destination**

172.17.24.65 9991

Ruijie(config-flow-cache)# **export destination**

172.16.10.2 9991

Ruijie(config-flow-cache)# **enabled**

| | |
|---|--|
| | |
| export destination (aggregation cache) | |
| enabled (aggregation cache) | |
| mask (IPv4) | |

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
    
```

```

r . . .

                no ip flow-cache entries
                IPFIX                                ip flow ingress ip
flow egress
IPFIX                                IPFIX
                no ip flow ingress                no ip flow egress
IPFIX                                IPFIX                                ip flow ingress
                IPFIX
    
```

```

131,072 (128K):
Ruijie(config)# ip flow-cache entries 131072
    
```

| | |
|------------------------|--|
| | |
| ip flow ingress | |

| | |
|-----------------------|--|
| ip flow egress | |
|-----------------------|--|

| | |
|------------------------------|--|
| ip flow-cache timeout | |
|------------------------------|--|



ip flow ingress

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

```
20      10
```

```
IPFIX      ip flow-export destination
IPFIX
IP
IP
IP
IP
```

```
IPFIX
```

```
Ruijie(config)# ip flow-export destination
10.42.42.1 9991
```

```
IPFIX
```

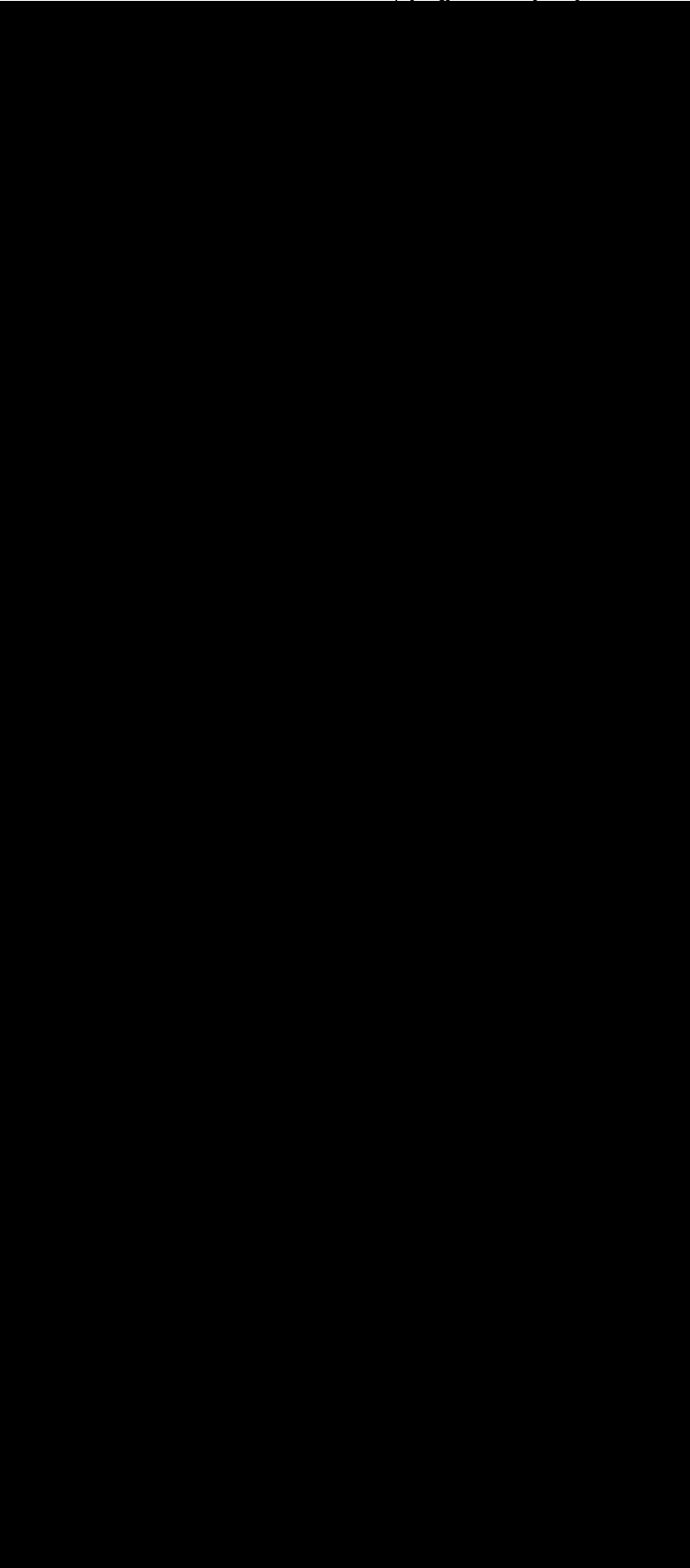
```
Ruijie(config)# ip flow-export destination
10.42.42.1 9991
Ruijie(config)# ip flow-export destination
10.0.101.254 9991
```

```
IPFIX
```

```
Ruijie(config)# ip flow-export destination
10.42.42.1 9991
Ruijie(config)# ip flow-export destination
10.42.42.2 9992
```

```
Ruijie(config)# ip flow-export template refresh-rate
100
Ruijie(config)# ip flow-export template timeout-rate 60
```

| | |
|------------------------|--|
| | |
| ip flow ingress | |
| ip flow egress | |
| | |



IPFIX

source**minimum***value* 1 32

0 mask

IP

```
' ( )
' TOS ( )
' ( )
' Prefix-port ( )
' Prefix-TOS ( )
' Source prefix ( )
' Source prefix TOS ( )
```

source-prefix :Ruijie(config)# **ip flow-aggregation cache****source-prefix**Ruijie(config-flow-cache)# **mask source minimum 8****destination-prefix** :Ruijie(config)# **ip flow-aggregation cache****destination-prefix**Ruijie(config-flow-cache)# **mask destination****minimum 32**

| ip flow ingress | |
|-------------------------------|-------|
| ip flow egress | |
| ip flow-cache timeout | |
| show ip flow cache | |
| show ip flow interface | IPFIX |

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
```

| | |
|---------------------|--|
| | |
| flow-sampler | |

31.1.18 sort-by

top talker

no

sort-by [bytes | packets]**no sort-by [bytes | packets]****bytes****packets**

top-talker

```
Ruijie(config-flow-top-talks)#sort-by bytes
```

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

show flow-sampler [*sampler-map-name*]

sampler-map-name flow-sampler-map

```
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 | Et1/2 | 10.1.3.2 | | | |
| Et1/1 | 1124 | 55 | 10 | 3748 | 0 | () 5.8 () 5.8 () 5.8 (30) 102.9 |

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

```
Ruijie# show ip flow export
Main Cache
Exporting flows to 10.51.12.4 (9991)
Exporting using source IP address 10.1.97.17
Version 9 flow records
Option Template Flag = 1
Template ID = 256
Template timeout = 90
Template refresh rate = 15
Option Template ID = 257
Option Template timeout = 30
Option Template refresh rate = 10
40 flows exported in 20 udp datagrams
0 flows failed to export
0 messages failed to export

Exporting flows to 10.1.97.50(9111)
Exporting using source IP address 10.1.97.17
Version 10 flow records
Option Template Flag = 1
Template ID = 258
Template timeout = 90
Template refresh rate = 15
Option Template ID = 259
Option Template timeout = 30
Option Template refresh rate = 10
40 flows exported in 20 udp datagrams
0 flows failed to export
0 messages failed to export

Cache for protocol-port aggregation:
Exporting flows to 172.16.20.4 (991) 172.30.0.1 (991)
```

```
Exporting using source IP address 172.16.6.2
Version 9 flow records
Template ID = 260
Template timeout = 120
Template refresh rate = 25
40 flows exported in 20 udp datagrams
0 flows failed to export
0 messages failed to export

Cache for source-prefix aggregation:
Exporting flows to 172.16.20.4 (991) 172.30.0.1 (991)
Exporting using source IP address 172.16.6.2
Version 9 flow records
Template ID = 261
Template timeout = 120
Template refresh rate = 25
40 flows exported in 20 udp datagrams
0 flows failed to export
0 messages failed to export

Total:
160 flows exported in 80 udp datagrams
0 flows failed to export
0 messages failed to export
6 Templates added
6 Templates active
2 Option templates added
2 Option templates active
```

31.2.5 show ip flow interface

```
show ip flow interface IPFIX
```

```
show ip flow interface
```

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
```

32 VRF

32.1 VRF

VRF

- ' **show ip route vrf**
- ' **clear ip route vrf**
- ' **ip vrf**
- ' **ip vrf forwarding**
- ' **show ip vrf**

32.1.1 show ip route vrf

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
```

v u 1 ñ 1

Q d \ ì R @E br a h - " b

32.1.5 route-target

```
[no] route-target {import|export|both} rt_value
```

```
vrf rt
```

```
import vrf import
```

```
export vrf export
```

```
both vrf import export
```

```
rt_value
```

```
' rt_value as_num nn
```

```
as_num ,nn
```

```
' rt_value ip_addr:nn
```

```
ip_addr IP ,nn
```

Route-Target

```
vrf
```

```
vrf route-target.import vrf export
```

```
vrf
```

```
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 |

RGOS10.3(3)

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

interfaces

```
Ruijie# show ip vrf redvrf
```

```
RGOS10.1
```

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

```

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

RIP

```

address-family
(config-router-af)# VRF RIP
VRF RIP

```

```

exit-address-family exit

```

```

vpn1 VRF vrf
RIP
Ruijie(config)# -2f771 -1.44 D-0.0001 (Ruijie(co-ipr-af)#

```


RIPv2

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

```
Ruijie(config-router)# default-metric 3
Ruijie(config-router)# redistribute ospf 100
```

| | |
|---------------------|--|
| | |
| redistribute | |

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]
```

| | |
|-------------------------------------|-----------------------------|
| | |
| always | RIP |
| metric <i>metric-value</i> | <i>metric-value</i> 1-15 |
| route-map <i>map-name</i> | route-map , route-map |

metric 1

RIP

default-information originate

always RIP

show ip rip database RIP

```

RIP
set metric
metric
route-map set metric
RIP
metric
route-map
RIP
RIP
ip default-network
default-information originate
RIP

```

```

RIP
Ruijie(config-router)# default-information originate
always

```

120

RIP

RIP

RIP

RIP 160, 192.168.12.1
123

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

33.1.6 distribute-list in RIP

distribute-list in **no**

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

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

| | |
|--|--------|
| | |
| <i>access-list-number</i> | |
| prefix <i>prefix-list-name</i> | |
| gateway <i>prefix-list-name</i> | |
| <i>interface-type interface-number</i> | () |

RIP Fastethernet 0/0
172.16

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

| 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> | |
|---------------------------------------|-----|
| prefix <i>prefix-list-name</i> | |
| <i>interface</i> | () |

| | |
|---------------------|-------------------------------------|
| <i>protocol</i> | () |
| <i>process-id</i> | () <i>protocol</i> OSPF OSPF id |
| <i>process-name</i> | () <i>protocol</i> ISIS 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

```

| | |
|---------------------|--|
| | |
| access-list | |
| prefix-list | |
| redistribute | |

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
```

| | |
|-----------------------|--|
| | |
| address-family | |

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
    
```

| | |
|--|-----|
| | |
| ip rip authentication mode | RIP |
| ip rip authentication text-password | RIP |
| key chain | |

33.1.10 ip rip authentication mode

```

                RIP      ip rip authentication
mode      no      RIP
ip rip authentication mode {text | md5}
no ip rip authentication mode
    
```

| | |
|-------------|---------|
| | |
| text | RIP |
| md5 | RIP MD5 |

```

                RIP      RIP
RIP      RIP      RIP
RIPv1      RIP      RIPv2
    
```

Serial 0

RIP

MD5

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

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

33.1.11 ip rip authentication text-password

RIP

ip rip authentication

text-password no

ip rip authentication text-password *password-string*

no ip rip authentication text-password

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

RIP

RIPv1

RIP

RIPv2

Serial 0

RIP

ruijie

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

| ip rip authentication mode | RIP |
|--|--|
| ip rip authentication key-chain | RIP RIP RIPv2 RIP |

33.1.12 ip rip default-information

default-information RIP **ip rip**
 no

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 RIP
ip rip receive version **no**

ip rip receive version [1] [2]
no ip rip receive version

| 1 | RIPv1 |
|----------|-------|
| 2 | RIPv2 |

version

version
 RIP 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 RIP **ip rip**
send enable **no** RIP RIP

ip rip send enable

no ip rip send enable

RIP

no
default

RIP

RIP

Fastethernet 0/0 RIP

Ruijie(config)# **interface fastethernet 0/0**
Ruijie(config-if)# **no ip rip send enable**

| ip rip receive enable | RIP |
|------------------------------|-----|
| passive-interface | RIP |

33.1.16 ip rip send version

RIP RIP
ip rip receive version **no**

ip rip send version [1] [2]
no ip rip send version

| 1 | RIPv1 |
|----------|-------|
| 2 | RIPv2 |

version

```

RIP
    vesion
RIPv1  RIPv2
version
Fastethernet 0/0  RIPv1  RIPv2

```

```

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

```

| | |
|---------|-----|
| | |
| version | RIP |

33.1.17 ip rip v2-broadcast

```

RIP version 2
    ip rip v2-broadcast no

```

```

ip rip v2-broadcast
no ip rip v2-broadcast

```

version

```

RIP
    vesion

```

```
Ruijie(config)# interface fastethernet 0/0  
Ruijie(config-if)# ip rip v2-broadcast
```

| | |
|---------|-----|
| | |
| version | RIP |

33.1.18 ip split-horizon (RIP)

```
                RIP                ip split-horizon  
no            RIP  
  
ip split-horizon  
no ip split-horizon
```


| | |
|---------------------|-----|
| | |
| auto-summary | RIP |

33.1.20 network (RIP)

RIP

network no**network** *network-number* [*wildcard*]**no network** *network-number* [*wildcard*]

| | |
|-----------------------|-----------|
| | |
| <i>network-number</i> | IP 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>access-list-number</i> | acl |
| in | acl metric |
| out | acl metric |
| <i>offset</i> | metric |
| <i>interface-type</i> | acl |

| | |
|-------------------------|--|
| <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
output-delay no
output-delay delay
no output-delay

```

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

RIP 512 25
 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*}

| | |
|-------------------------------------|---------|
| | |
| default | 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

```

| ip rip receive enable | RIP |
|------------------------------|-----|
| ip rip send enable | 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 ]

```

| bgp isis ospf connected static | |
|---|--------|
| metric | metric |
| route-map | |
| match | ospf |
| <i>process-name</i> | ISIS |
| <1-65535> | OSPF |

RIP

RIP

async default routing

RIP

Ruijie(config)# **router rip**

| | |
|----------------------|-----|
| | |
| network (RIP) | RIP |

33.1.27 timers basic

RIP

timers basic

no

timers basic *update invalid flush***no timers basic**

| | |
|----------------|--|
| | |
| <i>update</i> | <i>update</i> 30 <i>invalid Flush</i> |
| <i>invalid</i> | <i>invalid</i> <i>invalid invalid</i> <i>Invalid 180</i> |

| | | | |
|--------------|------------------------------|------------------------------|----------------|
| <i>flush</i> | <i>flush</i> <i>Flush</i> | RIP <i>invalid</i> 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**

r .

2Mbps

A111\$d •= 'DRW "/_μ)2°R< %t "<0x Ã 1 ,X Áñ—q!1öĐ WÍPž „,5"Y úi@ÎQđ`" Uđ 1 ž b _ Öp1

RIPv1 RIPv2

RIPv1

RIP **ip rip receive version**
ip rip send version RIP

RIP 2

```
Ruijie(config)# router rip
Ruijie(config-router)# version 2
```

| ip rip receive version | RIP RIP |
|-------------------------------|------------|
| ip rip send version | RIP RIP |
| show ip rip | rip |

33.2

33.2.1 show ip rip

RIP **show ip rip**
show ip rip [vrf vrf-name]

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

RIP

RIP

33.2.2 show ip rip database

RIP

show ip rip database
show ip rip database [**vrf** *vrf-name*] [*network-number* {*network-mask*}]

| vrf <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*]

| | |
|--|--|
| | |
| bgp connected isis ospf static | |

vrf vrf-name

VRF RIP

| | |
|--------------------|--|
| | |
| show ip rip | |

33.2.4 show ip rip interface

RIP

show ip rip interface**show ip rip interface [vrf *vrf-name*]**

| | |
|----------------------------|---------|
| | |
| vrf <i>vrf-name</i> | 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

RIP BFD ,

RIP

Ruijie# **show ip rip peer**

Peer 192.168.3.2:

Local address: 192.168.3.1

Input interface: GigabitEthernet 0/2

Peer version: RIPv1

Received bad packets: 3

Received bad routes: 0

BFD session state up

| | |
|--------------------|--|
| | |
| show ip rip | |

34 OSPF

34.1

34.1.1 area

```

no OSPF
area area-id
no area area-id

```

| | |
|------------|--------------|
| ' | ' |
| ' UfYU!]X | ' CGD: 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

```

| | |
|-----------------|----------------|
| ' | ' |
| ' byhkc_f_ UfYU | ' CGD: 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: I D |
| ' aYggU[Y! X] [Ygh | ' A8) aYggU[Y X] [Ygh) |

RGOS

OSPF

OSPF

MD5

message-digest

message-digest

OSPF

ip

```
ospf authentication-key ip ospf  
message-digest-key MD5
```

```
OSPF 0 MD5  
backbone
```

```
Ruijie(config)# interface FastEthernet 0/.OSPF
```

| | |
|----------------|----------------|
| | |
| <i>area-id</i> | STUB NSSA |
| <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**

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 | ' bggU 56F bggU |
| ' XYZU ` h!] bZcf aUh] cb! cf] [] bUhY | ' + @G5 bggU BGG5 56F 5G6F |
| ' bc! gi aaUfm | ' bggU f156FŁ @G5 bggU |

NSSA

default-information-originate Type-7 LSA
nssa ABR ASBR ABR
Type-7 LSA ASBR (
ABR) Type-7 LSA
no-redistribution ASBR OSPF redistribute
NSSA NSSA
ASBR ABR nssa

NSSA
 ABR no-summary ABR LSA
 summary LSAs Type-3 LSA NSSA

area default-cost NSSA ABR
 NSSA
 NSSA 1

 1

```

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

| | |
|--------------------------|--------------|
| | |
| area default-cost | NSSA OSPF |

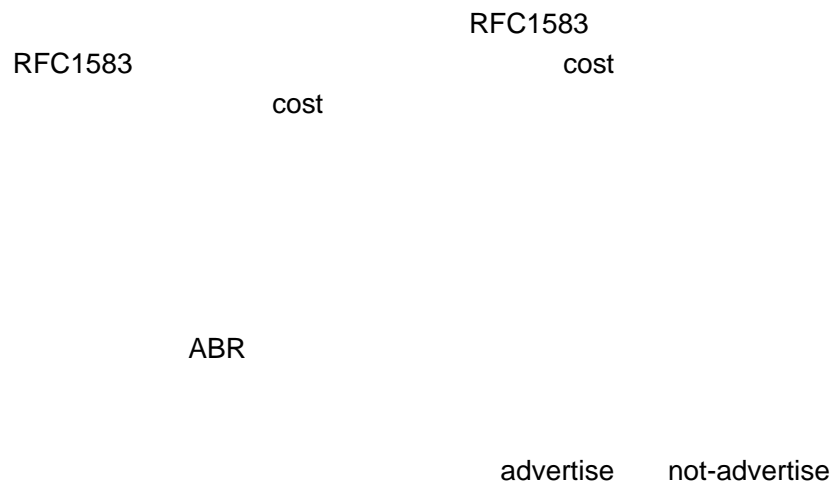
34.1.6 area range

OSPF
range no no area cost

area area-id range ip-address net-mask [advertise | not-advertise]
[cost cost]
no area area-id range ip-address net-mask [cost]

| | |
|----------------|------|
| | |
| <i>area-id</i> | OSPF |

| | |
|----------------------------------|--|
| <i>ip-address</i> | |
| advertise not-advertise | |
| cost <i>cost</i> | |



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


```
Ruijie(config-router)# area 1 stub
```

| | |
|--------------------------|--------------|
| | |
| area default-cost | STUB OSPF |

34.1.8 area virtual-link

OSPF area virtual-link
no

```
area area-id virtual-link router-id [authentication [message-digest | null]] [dead-interval seconds] [hello-interval seconds] [retransmit-interval seconds] [transmit-delay seconds] [[authentication-key key] | [message-digest-key key-id md5 key]]
no area area-id virtual-link router-id
```

| | |
|------------------------------------|------------------------------|
| | |
| <i>area-id</i> | OSPF IP |
| <i>router-id</i> | show ip ospf |
| dead-interval seconds | 40 |
| hello-interval seconds | OSPF Hello 10 |
| retransmit-interval seconds | OSPF LSA 5 |
| transmit-delay seconds | OSPF LSA LSA 1 LSA LSA |

| | |
|--|---|
| authentication-key <i>key</i> | OSPF service password-encryption |
| message-digest-key <i>key-id md5 key</i> | OSPF MD5 MD5 service password-encryption |
| authentication | |
| message-digest | MD5 |
| null | |

```

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 0.0.15.255 area 1
Ruijie(config-router)# area 1 virtual-link 2.2.2.2
                                1                1.1.1.1
                                10               OSPF
                                MD5
Ruijie(config)# router ospf 1
Ruijie(config-router)# network 172.16.17.0 0.0.15.255 area 1
Ruijie(config-router)# network 172.16.252.0 0.0.0.255 area 10
Ruijie(config-router)# area 0 authentication message-digest
Ruijie(config-router)# area 1 virtual-link 1.1.1.1
message-digest-key 1 md5 hello
```



100Mbps

```
( ) . default auto-cost no
auto-cost
```

```
ip ospf cost cost
cost
```

10M

```
Ruijie(config)# router ospf 1
Ruijie(config-router)# network 172.16.10.0 0.0.0.255 area 0
Ruijie(config-router)# auto-cost reference-bandwidth
10
```

| | |
|--------------|------|
| | |
| show ip ospf | ospf |

34.1.10 clear ip ospf process

OSPF

clear ip ospf (process-id) process

| | |
|-------------------|------|
| | |
| <i>process-id</i> | OSPF |
| | OSPF |

RFC2328

OSPF

OSPF 1

```
Ruijie# clear ip ospf 1 process
```

34.1.11 compatible rfc1583

AS

Ruijie(config-router)# **no compatible rfc1583**

| | |
|---------------------|------|
| | |
| show ip ospf | 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*]

| | |
|---------------|------|
| | |
| always | OSPF |

redistribute
ASBR

default-information

OSPF
ASBR

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
```

| | |
|---------------------|------|
| | |
| redistribute | |
| show ip ospf | ospf |

34.1.14 distance ospf

OSPF

| | |
|----------------------------------|-------------|
| <i>listname</i> | acl |
| gateway <i>plist-name</i> | gateway |
| prefix <i>plist-name</i> | prefix-list |
| interface-type <i>num</i> | LSA |

LSA SPF
ASBR OSPF ABR

```
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]
no distribute-list {listname | gateway plist-name | prefix plist-name}
```

out [**bgp** | **connected** | **isis** *area-tag* | **ospf** *process-id*] **rip** | **static**]

| <i>listname</i> | acl |
|--|-------------|
| gateway <i>plist-name</i> | gateway |
| prefix <i>plist-name</i> | prefix-list |
| [bgp connected isis <i>area-tag</i> ospf <i>process-id</i> rip static] | |

```

enable mib-binding
no
enable mib-binding
no enable mib-binding
    
```

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

MIB OSPFv2

```

OSPFv2 MIB OSPFv2 SNMP
OSPFv2 OSPFv2 MIB
OSPFv2
MIB SNMP OSPFv2
    
```

```

Ruijie(config)# router ospf 100
Ruijie(config-router)# enable mib-binding
    
```

| | |
|---------------------|-----------|
| | |
| show ip ospf | OSPF |
| enable traps | OSPF TRAP |

34.1.18 enable traps

| | | | |
|--------|------|------|----|
| OSPFv2 | 16 | TRAP | 4 |
| | TRAP | | no |
| TRAP | | | |

enable traps [error [IfAuthFailure | IfConfigError | IfRxBadPacket | VirtIfAuthFailure | VirtIfConfigError | VirtIfRxBadPacket] | Isa [LsdbApproachOverflow | LsdbOverflow | MaxAgeLsa | OriginateLsa] | retransmit [IfTxRetransmit | VirtIfTxRetransmit] | state-change [IfStateChange | NbrRestartHelperStatusChange | NbrStateChange | RestartStatusChange | VirtIfStateChange | VirtNbrRestartHelperStatusChange | VirtNbrStateChange]]

no enable traps [error [IfAuthFailure | IfConfigError | IfRxBadPacket | VirtIfAuthFailure | VirtIfConfigError | VirtIfRxBadPacket] | Isa [LsdbApproachOverflow | LsdbOverflow | MaxAgeLsa | OriginateLsa] | retransmit [IfTxRetransmit | VirtIfTxRetransmit] | state-change [IfStateChange | NbrRestartHelperStatusChange | NbrStateChange | RestartStatusChange | VirtIfStateChange | VirtNbrRestartHelperStatusChange | VirtNbrStateChange]]

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

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

no graceful-restart [**grace-period**]

| | |
|--------------------------------|------|
| | |
| graceful-restart helper | OSPF |

RGOS10.3(5b1),

34.1.20 graceful-restart helper

```

 OSPF (GR helper) graceful-restart
helper no
graceful-restart helper disable
no graceful-restart helper disable
graceful-restart helper {strict-lsa-checking | internal-lsa-checking}
no graceful-restart helper {strict-lsa-checking | internal-lsa-checking}
    
```



```

Grace-LSA          GR Helper
disable           GR
GR Helper
GR
strict-lsa-checking  internal-lsa-checking
                    LSA(types 1-5,7)
                    LSA(types 1-3)
                    LSA
                    GR
AS
    
```

OSPF 1 GR

```

Ruijie(config)# router ospf 1
Ruijie(config-router)# graceful-restart helper disable
Ruijie(config-router)# no graceful-restart helper
disable
Ruijie(config-router)# graceful-restart helper
strict-lsa-checking
    
```

| | |
|-------------------------|------|
| | |
| graceful-restart | OSPF |

34.1.21 RGOS10.3(5b1), ip ospf authentication

no

```

ip ospf authentication [message-digest | null]
no ip ospf authentication
    
```

| | |
|-----------------------|-----|
| | |
| message-digest | MD5 |
| null | |

no

null

FastEthernet 0/0 OSPF MD5

```
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 |

34.1.22 ip ospf authentication-key

```
OSPF      ip ospf
authentication-key      no
ip ospf authentication-key key
no ip ospf authentication-key
```

| | |
|------------|---|
| | |
| <i>Key</i> | 8 |

ip ospf authentication-key

OSPF
OSPF

OSPF

OSPF
ip ospf cost

OSPF

no

ip ospf cost *cost*

no ip ospf cost

| | |
|-------------|------|
| | |
| <i>cost</i> | OSPF |

/Bandwidth

100Mbps

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**

| | |
|---------------------|------|
| | |
| bandwidth | |
| show ip ospf | Ospf |

34.1.24 ip ospf database-filter all out

| | LSA | LSA |
|---------------------------------|-----|-----|
| , no | | |
| ip ospf database-filter all out | | |
| no ip ospf database-filter | | |
| | no | no |


```

ip ospf disable all
no ip ospf disable all

```

```

network area
network      ospf
OSPF        OSPF

```

```

Ruijie(config)# interface serial 1/0
Ruijie(config-if)# ip address 172.16.10.1
255.255.255.0
Ruijie(config-if)# ip ospf disable all

```

34.1.27 ip ospf hello-interval

```

OSPF      Hello
hello-interval      no
ip ospf hello-interval seconds
no ip ospf hello-interval

```

| | |
|---------|------------|
| | |
| seconds | OSPF hello |

```

'      10
' PPP HDLC      10
'
'      10

```

.25 30

hello hello OSPF

hello
hello

serial 1/0 OSPF Hello

15

```
Ruijie(config)# interface serial 1/0
Ruijie(config-if)# ip address 172.16.10.1
255.255.255.0
Ruijie(config-if)# encapsulation ppp
Ruijie(config-if)# ip ospf hello-interval 15
```

| | |
|------------------------------|------|
| | |
| ip ospf dead-interval | OSPF |

34.1.28 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-keyOSPF
OSPFOSPF
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

```

| | |
|-------------------------------|------|
| | |
| area authentication | OSPF |
| ip ospf authentication | |

34.1.29 ip ospf mtu-ignore

no **mtu**

ip ospf mtu-ignore

no ip ospf mtu-ignore

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

mtu

OSPF

MTU

34.1.30 ip ospf network

```

OSPF
no
ip ospf network broadcast non-broadcast point-to-multipoint [ non-broadcast ] point-to-point
no ip ospf network broadcast non-broadcast point-to-multipoint [ non-broadcast ] point-to-point
    
```

| broadcast | OSPF |
|--|---------------------|
| non-broadcast | OSPF NBMA |
| point-to-multipoint [non-broadcast] | OSPF, non-broadcast |
| point-to-point | 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
X.25          X.25 map
frame-relay map
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/BDR

```
Ruijie(config)# interface Serial1/0
Ruijie(config-if)#ip address 172.16.24.4 255.255.255.0
Ruijie(config-if)# encapsulation frame-relay
Ruijie(config-if)# ip ospf network broadcast
Ruijie(config-if)# ip ospf priority 0
```

| | | |
|------------------------|----|------|
| | | |
| dialer map ip | IP | |
| frame-relay map | IP | DLCI |
| neighbor OSPF | IP | NBMA |
| X25 map | IP | X.25 |

34.1.31 ip ospf priority

```
OSPF
no
ip ospf priority priority
no ip ospf priority
```

| | |
|-----------------|------|
| | |
| <i>Priority</i> | OSPF |

```

OSPF                hello                OSPF
DR/BDR
DR   BDR
DR   BDR
BDR                OSPF broadcast  non-broadcast                DR

```

```
r . . .
```

```

DR   BDR
DR   BDR

```

```
fastethernet 0/0                0
```

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

```
Ruijie(config-if)# ip ospf priority 0
```

| | |
|------------------------|------|
| | |
| ip ospf network | OSPF |

34.1.32 ip ospf retransmit-interval

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 |

34.1.33 ip ospf transmit delay

OSPF LSU **ip ospf**

transmit delay no

ip ospf transmit delay *seconds*
no ip ospf transmit delay

| | |
|----------------|--------------------------------|
| | |
| <i>Seconds</i> | OSPF LSU 1 |

1

```

LSU
LSAs
Age
ip ospf transmit delay

virtual-link
retransmit-interval
LSU
area
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 |

34.1.34 log-adj-changes

no default

no

```
Ruijie(config)# router ospf 1
Ruijie(config-router)# log-adj-changes detail
```

| | |
|--------------|------|
| | |
| show ip ospf | ospf |

34.1.35 max-concurrent-dd

DD

```
max-concurrent-dd <1-65535>
```

| | |
|-----------|----|
| | |
| <1-65535> | DD |

5

OSPF

DD

DD

4

```
Ruijie(config)# router ospf 10
Ruijie(config-router)# max-concurrent-dd 4
```

34.1.36 neighbor

OSPF neighbor no

neighbor *ip-address* [**poll-interval** *seconds*] [**priority** *priority*] [**cost** *cost*]

no neighbor *ip-address*

| | |
|--|--|
| | |
| <i>ip-address</i> | IP |
| poll-interval <i>seconds</i> | 120 Non-broadcast(NBMA) |
| priority <i>priority</i> | Non-broadcast(NBMA) |
| Cost <i>cost</i> | , cost point-to-multipoint [non-broadcast] |

RGOS

IP

IP

NBMA

Hello

M2z@W@O—BQU@r@!\$%&#

e

I

```

cost
.

OSPF IP
172.16.24.2 1 150

Ruijie(config)# router ospf 20
Ruijie(config-router)# network 172.16.24.0 0.0.0.255
area 0
Ruijie(config-router)# neighbor 172.16.24.2 priority 1
poll-interval 150
    
```

| | |
|-------------------------|------|
| | |
| ip ospf priority | OSPF |
| ip ospf network | OSPF |

34.1.37 network area

```

OSPF OSPF
network area no OSPF
network ip-address wildcard area area-id
no network ip-address wildcard area area-id
    
```

| | |
|-------------------|-------------------|
| | |
| <i>ip-address</i> | IP |
| <i>wildcard</i> | IP |
| <i>area-id</i> | OSPF OSPF OSPF |

OSPF

| | | | | | |
|-------------------|-----------------|--------------|-----------------|------|----------------|
| <i>ip-address</i> | <i>wildcard</i> | | | | |
| | OSPF | | | OSPF | |
| IP | | network area | IP | | network |
| area | IP | | IP | | |
| OSPF | | | | | |
| | | OSPF | network | IP | |
| | | | OSPF | | |
| | | | | | |
| | | | 0 1 172.16.16.0 | IP | |
| 192.168.12.0/24 | | | 1 | IP | |
| 172.16.16.0/20 | | | 172.16.16.0 | | |
| 0 | | | | | |

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
```

34.1.40 overflow memory-lack

no OSPF OVERFLOW
overflow memory-lack
no overflow memory-lack

| | |
|----|------------------|
| | |
| no | OSPF OVERFLOW |

OSPF OVERFLOW

serial 1/0

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

| | |
|------------------------|--|
| | |
| show ip ospf interface | |

34.1.42 redistribute

redistribute {**bgp** | **isis area-tag** | **ospf process-id** | **rip** | **connected** | **static**} {**level-1** | **level-1-2** | **level-2**} [**metric value** | **match** {**internal** | **external** | **external 1** | **external 2** | **nssa-external** | **nssa-external 1** | **nssa-external 2**}|**metric-type** {**1/2**} | **route-map map-tag** | **tag** <0-4294967295> | **subnets**]

no redistribute {**bgp** | **isis area-tag** | **ospf process-id** | **rip** | **connected** | **static**} {**level-1** | **level-1-2** | **level-2**} [**metric value** [**match** {**internal** | **external 1** | **external 2** | **nssa-external 1** | **nssa-external 2**}] | **metric-type** {**1/2**} | **route-map map-tag** | **tag** <0-4294967295> | **subnets**]

| | |
|--|---------------------------|
| bgp isis area-tag ospf process-id rip connected static | |
| metric | OSPF extern2 LSA metric |
| Level-1/ level-1-2/ level-2 | IS-IS level level-2 IS-IS |
| match | OSPF OSPF |
| metric-ty | E-1 E-2 |
| route-map | |
| tag | OSPF tag |
| subnets | |

```

type-5 LSA
metric 20
isis
level
level
level-1-2
ospf
ospf
match
route-map
match
level
ASBR
OSPF
metric 1
level
level
level 1, level 2
match
route-map
OSPF
level
OSPF
tag
level-2
level
level 1, level 2
match
no
match
route-map

```

OSPF

```
Ruijie(config-router)# redistribute static subnets
Ruijie(config)# router ospf 1
Ruijie(config-router)# redistribute ospf 2 subnets
Ruijie(config-router)# redistribute ospf 2 match
external 1 internal
Ruijie(config-router)# redistribute isis isis-001
Ruijie(config-router)# redistribute isis isis-001
level-1
```

Show run

```
router ospf 1
redistribute ospf 2 match external 1 internal subnets
redistribute isis isis-001 level-1-2
```

34.1.43 router ospf

```
no OSPF router ospf
no OSPF
router ospf process-id [vrf vrf-name]
no router ospf process-id
```

| | |
|-------------------|--------------|
| | |
| <i>process-id</i> | ospf |
| <i>vrf-name</i> | OSPF VRF VRF |

OSPF

```
RGOS10.1 ospf
```

```
vrf vpn_1 OSPF 10
```

```
Ruijie(config)# router ospf 10 vrf vpn_1
```

| | |
|-------------------|------|
| | |
| show ip protocols | |
| show ip ospf | ospf |

34.1.44 router-id

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

| | |
|-----------|--------|
| | |
| router-id | ID, IP |

```
OSPF ip
```

```
ip
```

```
, LSA . OSPF
```

```
loopback ospf
```

```

router-id 0.0.0.36

Ruijie(config)# router ospf 20
Ruijie(config-router)# router-id 0.0.0.36
    
```

| | |
|--------------------------|--|
| | |
| show ip protocols | |

34.1.45 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> | |
| not-advertise | |

```

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
    
```

| | |
|-------------------|------|
| | |
| area range | OSPF |

34.1.46 timers lsa-group-pacing

LSA

no

timers lsa-group-pacing *seconds*

no timers lsa-group-pacing

| | |
|----------------|------------------|
| | |
| <i>seconds</i> | LSA : 10-1800 |

: 240

LSA
4
LSA
10000 LSA 40~100
10~20

120

```
Ruijie(config)#router ospf 20  
Ruijie(config-router)#timers
```

```

2      timers throttle spf      RGOS      timers spf
      SPF                      timers throttle spf
      timers throttle spf
    
```

```

spf-delay  spf-holdtime      OSPF
                                           CPU
    
```

```

r      .
timers spf      timers throttle spf
    
```

```

                                           OSPF      3  9
Ruijie(config)# router ospf 20
Ruijie(config-router)# timers spf 3 9
    
```

| | |
|----------------------------|--|
| | |
| show ip ospf | ospf |
| timers throttle spf | SPF timers spf timers throttle spf timers spf |

34.1.48 timers throttle spf

```

OSPF      SPF      SPF
          timers throttle
spf      no
    
```

timers throttle spf *spf-delay spf-holdtime spf-max-waittime*

no timers throttle spf

| <i>spf-delay</i> | SPF 1-600000 OSPF SPF <i>spf-delay</i> |
|-------------------------|---|
| <i>spf-holdtime</i> | SPF 1-600000 |
| <i>spf-max-waittime</i> | SPF 1-600000 |

spf-delay 1000

spf-holdtime 5000

spf-max-waittime 10000

spf-delay SPF SPF
SPF SPF
spf-holdtime SPF
spf-max-waittime SPF
SPF SPF
spf-holdtime
spf-delay *spf-holdtime*
spf-max-waittime SPF



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

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 Adjency Changes : Enabled
Graceful-restart disabled
Graceful-restart helper support enabled
Number of areas attached to this router: 1
Area 0 (BACKBONE)
Number of interfaces in this area is 1(1)
Number of fully adjacent neighbors in this area is 1
Area has no authentication
SPF algorithm last executed 00:01:26.640 ago
SPF algorithm executed 4 times
Number of LSA 3. Checksum 0x0204bf
```

Area 1 (NSSA)
Number of interfaces in this area is 1(1)
Number of fully adjacent neighbors in this area is 0
Number of fully adjacent virtual neighbors through this area is 0
Area has no authentication
SPF algorithm last executed 02:09:23.040 ago
SPF algorithm executed 4 times
Number of LSA 6. Checksum 0x028638
NSSA Translator State is elected

OSPF BFD , "BFD is enabled",

```
Ruijie# show ip ospf
Routing Process "ospf 1" with ID 1.1.1.1
Process uptime is 4 minutes
Process bound to VRF default
Conforms to RFC2328, and RFC1583Compatibility flag is enabled
Supports only single TOS(TOS0) routes
Supports opaque LSA
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

| | |
|---|----------------------|
| SPF-holdtime | SPF |
| LsaGroupPacing | LSA |
| Incomming current DD exchange neighbors | incomming exstart |
| Outgoing current DD exchange neighbors | outgoing exstart |
| Number of external LSA | LSA |
| External LSA Checksum Sum | LSA |

Number of opaque LSA

| | |
|------------------------------|--|
| SPF algorithm executed times | SPF |
| Number of LSA | LSA |
| Checksum Sum | LSA |
| NSSA Translator State | LSA OSPF NSSA LSA External ABR |
| 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
OSPF
OSPF
OSPF
    
```

show ip ospf border-routers

```

Ruijie# show ip ospf border-routers
OSPF internal Routing Table

Codes: i - Intra-area route, I - Inter-area route

i 1.1.1.1 [2] via 10.0.0.1, FastEthernet 0/1, ABR, ASBR,
Area 0.0.0.1 select
    
```

| | |
|------------------|---------------|
| | |
| Codes | i |
| I | |
| 1.1.1.1 | OSPF |
| [2] | cost |
| via 10.0.0.1 | |
| 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**]

show ip ospf [*process-id area-id*] **database** [**asbr-summary**] [*link-state-id*] [**self-originate**]

show ip ospf [*process-id area-id*] **database** [**external**] [*link-state-id*]

show ip ospf [*process-id area-id*] **database** [**external**] [*link-state-id*] [**adv-router ip-address**]

show ip ospf [*process-id area-id*] **database** [**external**] [*link-state-id*] [**self-originate**]

show ip ospf [*process-id area-id*] **database** [**nssa-external**] [*link-state-id*]

show ip ospf [*process-id area-id*] **database** [**nssa-external**] [*link-state-id*] [**adv-router ip-address**]

show ip ospf [*process-id area-id*] **database** [**nssa-external**] [*link-state-id*] [**self-originate** | **maxage**]

show ip ospf [*process-id area-id*] **database** [**database-summary**]

| | |
|-----------------------|------|
| | |
| <i>Area-id</i> | |
| adv-router | |
| <i>link-state-id</i> | OSPF |
| self-originate | |

| | |
|-------------------------|-------------|
| maxage | LSA |
| router | OSPF |
| network | OSPF |
| summary | OSPF |
| asbr-summary | ASBR |
| external | OSPF |
| nssa-external | OSPF |
| opaque-area | LSA |
| opaque-as | LSA |
| opaque-link | LSA |
| database-summary | OSPF LSA |

OSPF

OSPF

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 OSPF |
|---------------------|-----------|

OSPF

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

| OSPF Router with ID | OSPF |
|--------------------------------|------|
| Type-5 AS External Link States | |
| LS age | |
| Options | |
| LS Type | |
| Link State ID | |
| Advertising Router | |
| LS Seq Number | |
| Checksum | |
| Length | |
| Network Mask | |
| Metric Type | |
| TOS | TOS |

```

LS Seq Number: 80000001
Checksum: 0x5366
Length: 32
Network Mask: /24
Attached Router: 1.1.1.1
Attached Router: 3.3.3.3
    
```

show ip ospf database network

| OSPF Router with ID | OSPF |
|---------------------|------|
| Network Link States | |
| 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 |
|------------------------|------|
|------------------------|------|

```

LS Type: summary-LSA
Link State ID: 10.0.0.0 (summary Network Number)
Advertising Router: 1.1.1.1
LS Seq Number: 80000004
Checksum: 0x330e
Length: 28
Network Mask: /24
TOS: 0 Metric: 11
    
```

show ip ospf database summary

| 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 | |
| LS age | |
| Options | |
| LS Type | |
| Link State ID | |
| Advertising Router | |
| LS Seq Number | |
| Checksum | |
| Length | |
| Network Mask | |
| Metric Type | |
| TOS | TOS 0 |
| Metric | |
| NSSA:Forward Address | 0.0.0.0 IP |

External Route Tag

| | |
|--------------------|------------------------------------|
| Network Mask | |
| Metric Type | |
| TOS | TOS 0 |
| Metric | |
| Forward Address | 0.0.0.0 IP |
| External Route Tag | OSPF 32 OSPF |

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 |

34.2.4 show ip ospf interface

OSPF

show ip

ospf interface

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

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

LS-Ack received 46 sent 23, Discarded 1

BFD :

```
Ruijie# show ip ospf interface fa 1/0
FastEthernet 1/0 is up, line protocol is up
Internet Address 192.88.88.27/24, Ifindex 4, Area 0.0.0.0,
MTU 1500
Matching network config: 192.88.88.0/24
Process ID 1, Router ID 1.1.1.1, Network Type BROADCAST, Cost:
1
Transmit Delay is 1 sec, State DR, Priority 1, BFD enabled
Designated Router (ID) 1.1.1.1, Interface Address
192.88.88.27
Backup Designated Router (ID) 3.3.3.3, Interface Address
192.88.88.72
Timer intervals configured,Hello 10,Dead 40,Wait
40,Retransmit 5
Hello due in 00:00:03
Neighbor Count is 1, Adjacent neighbor count is 1
Crypt Sequence Number is 70784
Hello received 1786 sent 1787, DD received 13 sent 8
LS-Req received 2 sent 2, LS-Upd received 29 sent 53
LS-Ack received 46 sent 23, Discarded 1
```

show ip ospf interface serial 1/0

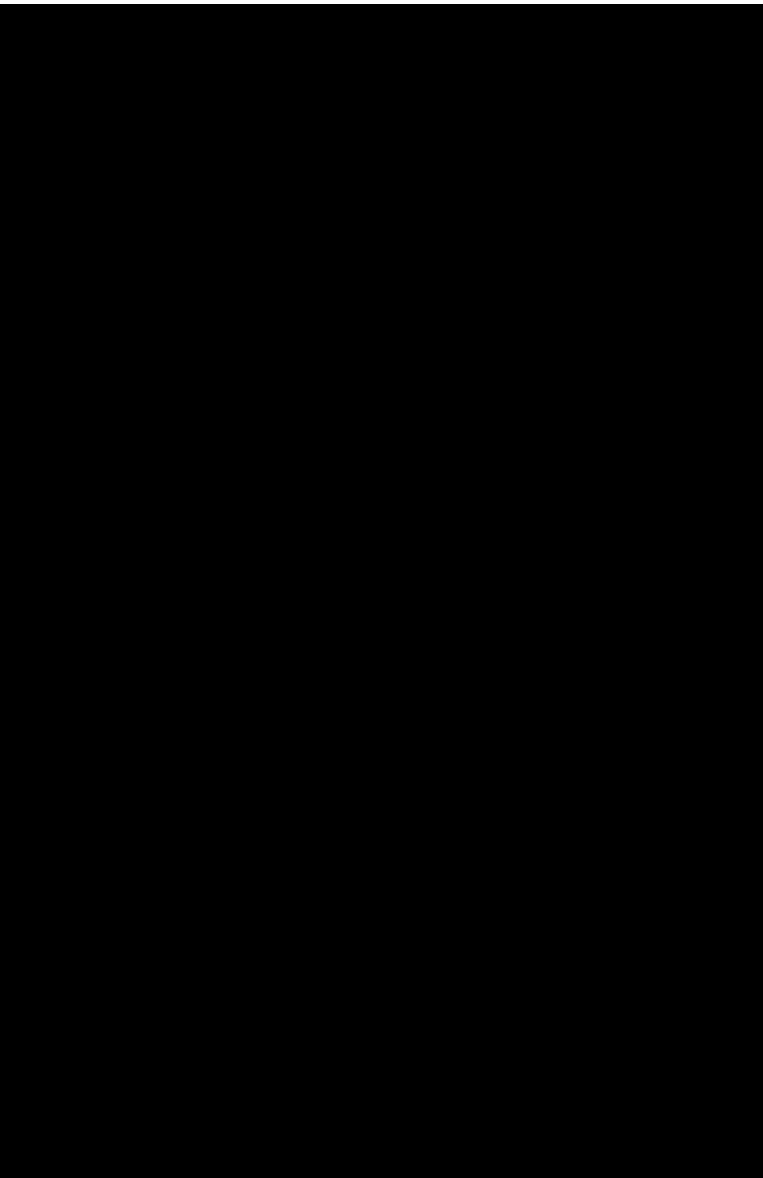
| FastEthernet 0/0 State | Down UP |
|-------------------------|-------------------|
| Internet Address | IP |
| Area | OSPF |
| MTU | MTU |
| Matching network config | OSPF network area |
| Process ID | |
| Router ID | OSPF |
| Network Type | OSPF |
| Cost | OSPF |
| Transmit Delay is | OSPF |

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

Time



| | |
|--|--|
| | |
| detail | |
| <i>interface-type</i> <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
 Graceful-restart helper disabled
 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 |
| | OSPF FULL |
| | DR |
| State | BDR |


```

OSPF process 1:
Codes: C - connected, D - Discard, O - OSPF,
IA - OSPF inter area N1 - OSPF NSSA external type 1,
N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2
E2 100.0.0.0/24 [1/20] via 192.88.88.126, FastEthernet
1/0
C    192.88.88.0/24 [1] is directly connected,
FastEthernet 1/0, Area 0.0.0.1
    
```

show ip ospf route

| | |
|--------------|------|
| | |
| codes | |
| 100.0.0.0/24 | |
| [1] | cost |
| via | |

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
virtual-link

show ip ospf

show ip ospf neighbor

show ip ospf neighbor

35 BGP CLI

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 IPv4
BGP 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*

| | |
|----------------------------|--|
| | |
| exit-address-family | |

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]

vpn

BGP

vpn vpn PE
vpn ì' %X†KÁ S†3m Ä

BGP **exit-address-family**

```
Ruijie(config)# router bgp 65000
```

```
Ruijie(config-router)# address-family vpnv4  
                         S*üA½ Q!õ% Äx
```



exit-address-family

Ä y

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 auto-summary

BGP

no

auto-summary

no auto-summary

BGP

BGP

BGP IPv4

```
Ruijie(config)# router bgp 65000  
Ruijie(config-router)# auto-summary
```

| | |
|-------------------|-----|
| | |
| router bgp | BGP |

35.1.6 bgp always-compare-med

```

BGP Multi Exit Discriminator MED
no
Tw[ntways-compare-med
no Tw[ntways-compare-med

```

```

AS MED
BGP

```

```

AS AS MED MED
MED
IGP

```

```

Ruijie(config)# router 65000
Ruijie(config-router)# always-compare-med

```

| show ip Tw[| BGP |
|----------------------------------|-----------|
| Tw[bestpath med confed | AS MED |
| Tw[bestpath med missing-as-worst | MED |
| Tw[deterministic-med | AS |

35.1.7 Tw[bestpath as-path ignore

```

no
bgp bestpath as-path ignore
no bgp bestpath as-path ignore

```

```

AS
BGP

```

```

(RFC1771) BGP AS
AS
AS

```

```

Ruijie(config)# router bgp 65000
Ruijie(config-router)# bgp bestpath as-path ignore

```

| | |
|-------------|-----|
| | |
| show ip bgp | BGP |

35.1.8 bgp bestpath compare-confed-aspash

```

ASPATH ASPATH no
bgp bestpath compare-confed-aspash
no bgp bestpath compare-confed-aspash

```

```

ASPATH ebgp peer

```

BGP

EBGP peer

ASPATH

ASPATH

ASPATH

ASPATH

```
Ruijie(config)# router bgp 65000  
Ruijie(config-router)# bgp bestpath  
compare-confed-aspath
```

| | |
|--------------------|-----|
| | |
| show ip bgp | BGP |

bgp router-id BGP Router ID

router ID

```
Ruijie(config)# router bgp 65000  
Ruijie(config-router)# bgp bestpath compare-routerid
```

| show ip bgp | BGP |
|----------------------|---------------|
| bgp router-id | BGP Router ID |

35.1.10 bgp bestpath med confed

MED AS

| | |
|--|-----------|
| show ip bgp | BGP |
| bgp bestpath always-compare-med | AS MED |
| bgp bestpath med missing-as-worst | MED |
| bgp deterministic-med | AS |

35.1.11 bgp bestpath med missing-as-worst

MED

no

bgp bestpath med missing-as-worst

no bgp bestpath med missing-as-worst

MED

MED

0 MED

BGP

MED

MED

0 MED

MED

MED

```
Ruijie(config)# router bgp 65000
```

```
Ruijie(config-router)# bgp bestpath med
```

```
missing-as-worst
```

| | |
|---------------------|-----|
| | |
| show ip bgp | BGP |
| bgp bestpath | |

always-compare-med

AS

MED

35.1.13 bgp cluster-id

no

bgp cluster-id *cluster-id*

no bgp cluster-id [*cluster-id*]

| <i>cluster-id</i> | (ip) | 4 |
|-------------------|--------|---|

router-id

BGP

router ID

ID

Ruijie(config)# **router bgp** 65000

Ruijie(config-router)# **bgp cluster-id** 10.0.0.1

| bgp client-to-client reflection | |
|--|--|
| neighbor route-reflector-client | |

35.1.14 bgp confederation identifier

AS

no

bgp confederation identifier *as-number*

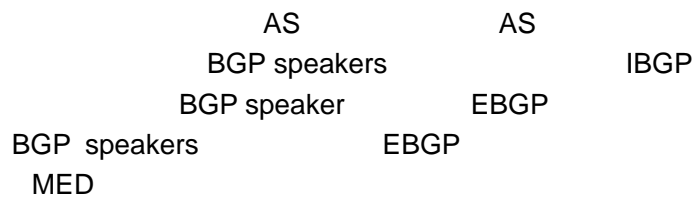
no bgp confederation identifier

| | |
|------------------|-------------|
| | |
| <i>as-number</i> | AS 1..65535 |

BGP

IBGP

ID(AS)



```
Ruijie(config-router)# bgp confederation identifier
65000
```

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

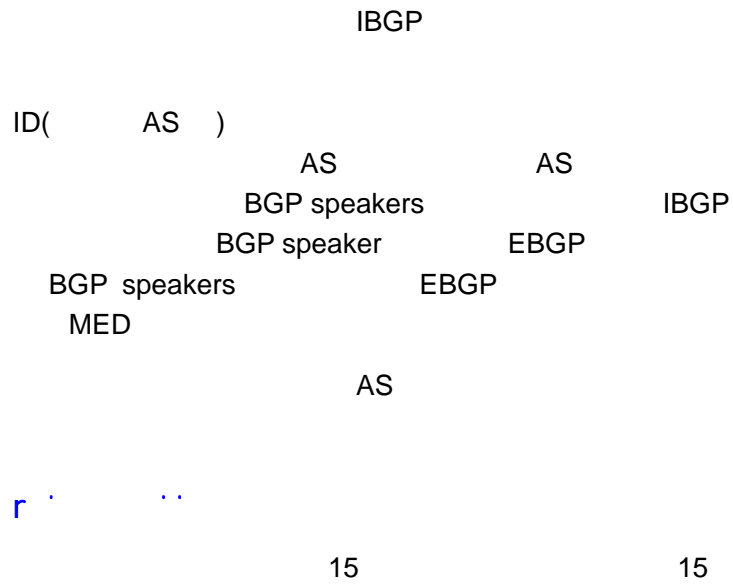
bgp confederation peers

AS

(bgp confederation identifier 65000)

| | |
|------------------|-------------|
| | |
| <i>as-number</i> | AS 1..65535 |

BGP



Ruijie(config-router)#

bgp default ipv4-unicast
no bgp default ipv4-unicast

BGP Local preference IBGP peers
Local preference

BGP speaker IBGP peers

```
Ruijie(config-router)# bgp default local-preference  
200
```

| show ip bgp | BGP |
|--|--------|
| bgp bestpath always-compare-med | MED AS |
| bgp bestpath med confed | MED AS |
| bgp bestpath med missing-as-worst | MED |

35.1.18 bgp deterministic-med

AS

MED

```
Ruijie(config-router)# bgp deterministic med
```

| show ip bgp | BGP |
|--|--------|
| bgp bestpath always-compare-med | MED AS |
| bgp bestpath med confed | MED AS |
| bgp bestpath med missing-as-worst | MED |

35.1.19 **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
```

| show ip bgp | BGP |
|--------------------|-----|

35.1.20 **bgp fast-external-fallover**

EBGP peer
BGP

no

bgp fast-external-fallover

no bgp fast-external-fallover

BGP

EBGP

Ruijie(config-router)# **bgp faster-external-fallover**

bgp graceful-restart GR Open GR
GR BGP GR GR

r BGP GR BGP
Peer GR clear ip bgp
Peer BGP

BGP BGP
BGP S8600 S9600 IPv4
GR GR Helper BGP

Ruijie(config)# router bgp 500
Ruijie(config-router)# **bgp graceful-restart**

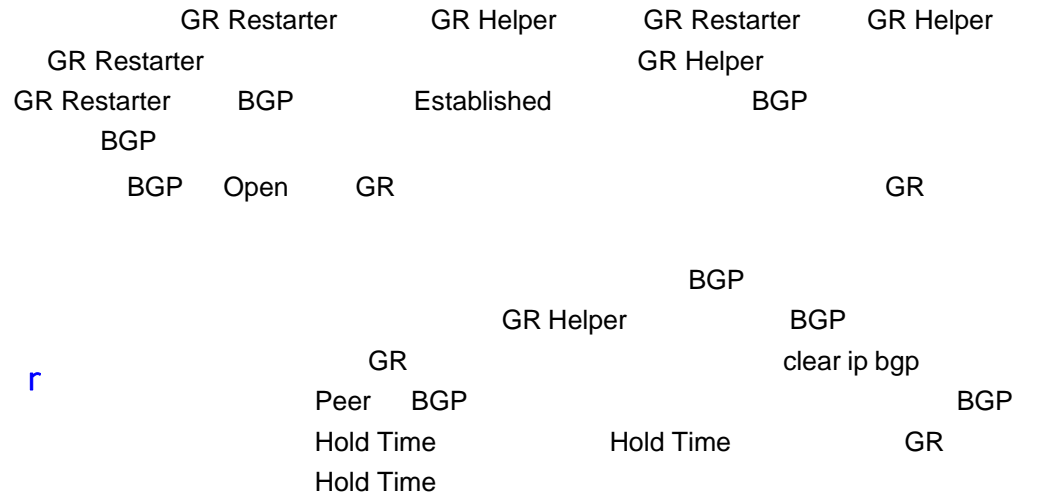


|

120

|

BGP



| | | |
|-------------|--------|-------|
| <i>time</i> | GR | stale |
| | 1 3600 | |

360

BGP

```

GR Helper      stalepath-time  GR Helper      GR
Restarter      Restarter  EOR            GR Helper
GR Restarter   Restarter      Stale
GR Helper      GR Restarter
Stale          stalepath-time  Stale
GR Helper      GR
Restarter  EOR

```

```

Ruijie(config)# router bgp 500
Ruijie(config-router)# bgp graceful-restart
Ruijie(config-router)# bgp graceful-restart stalepath-time 240
Ruijie(config-router)# no bgp graceful-restart stalepath-time

```

| | |
|-----------------------------|-----|
| bgp graceful-restart | BGP |
|-----------------------------|-----|

| | |
|-----------|--|
| 10.3(5b1) | |
|-----------|--|

35.1.24 bgp log-neighbor-changes

```

debug BGP Up/Down
no
bgp log-neighbor-changes
no bgp log-neighbor-changes

```

Up/Down

BGP

debug **debug** BGP BGP
debug BGP Established Established
 Established

Ruijie(config-router)#no bgp log-neighbor-changes

| router bgp | BGP |
|------------|-----|

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

route-id

BGP

BGP

ID—IP

Ruijie(config-router)# **bgp router-id 10.0.0.1**

| show ip bgp dampening dampened-paths | |
|---|--|
| bgp dampening | |

35.1.26 bgp update-delay

BGP Speaker **no bgp update-delay**

BGP

bgp update-delay delay-time

no bgp update-delay

| <i>delay-time</i> | BGP Speaker 0 3600 120 BGP EOR 1 3600 |
|-------------------|--|

120

BGP

BGP

bgp update-delay

BGP
5000
Update Delay

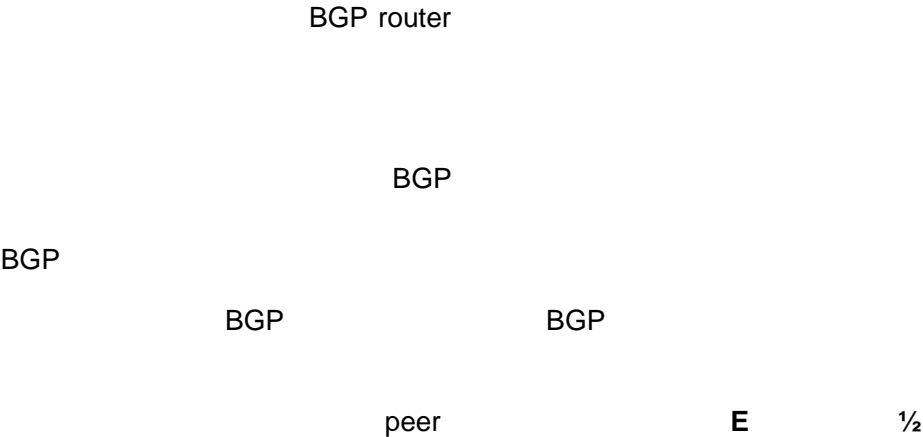
200

BGP
EOR
1
Update Delay

100
100
240

| | |
|-----------------|--|
| out | |
| soft | |
| soft in | |
| soft out | |

r



35.1.28 clear bgp ipv4 unicast dampening

clear bgp ipv4 unicast dampening [*address* [*mask*]]

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

BGP
BGP

```
Ruijie# clear bgp ipv4 unicast dampening 192.168.0.0  
255.255.0.0
```

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

**show ip bgp dampening
dampened-paths**

Eè=rJ"•bD α• Aò/ >• U ` ,2°P[Qd



in

soft

?

clear ip bgp dampening

Ruijie# **clear bgp ipv4 unicast flap-statistics**

| bgp dampening | |
|----------------------|-----|
| show ip bgp | BGP |

35.1.31 clear bgp ipv4 unicast peer-group

clear bgp ipv4 unicast peer-group *peer-group-name* [[**soft**] [**in** | **out**]]

| <i>peer-group-name</i> | |
|------------------------|------------------|
| in | soft |
| out | soft BGP speaker |
| soft | |
| soft in | |
| soft out | |

BGP

Ruijie# **clear bgp ipv4 unicast peer-group my-group in**

| clear ip bgp | BGP |
|---------------------|-----|
| show ip bgp | BGP |

35.1.32 clear ip bgp

BGP

clear ip bgp { * | ipv4 unicast address | as number } [soft [in | out]]

| * | BGP BGP ipv4 unicast OVERFLOW |
|------------------|----------------------------------|
| ipv4 | peer ipv4 |
| <i>address</i> | peer BGP |
| <i>as number</i> | AS |

r

BGP router

BGP

BGP

BGP

BGP

peer
soft-reconfiguration inbound BGP **neighbor**
speaker BGP BGP

show ip bgp neighbors BGP

neighbor soft-reconfiguration inbound

Ruijie# **clear ip bgp ***

| neighbor soft-reconfiguration inbound | BGP session () BGP |
|--|---------------------|
| show ip bgp | BGP |

35.1.33 clear ip bgp dampening

clear ip bgp [ipv4 unicast] dampening []

| | |
|-------------|--|
| <i>mask</i> | |
|-------------|--|

BGP
BGP

Ruijie# **clear ip bgp dampening 192.168.0.0 255.255.0.0**

| | |
|---|--|
| | |
| show ip bgp dampening dampened-paths | |
| bgp dampening | |

35.1.34 clear ip bgp external

EBGP

clear ip bgp external [ipv4 unicast] [[soft] [in | out]]

| | |
|---------------------|------------------|
| | |
| ipv4 unicast | ipv4 |
| in | soft |
| out | soft BGP speaker |
| soft in | |
| soft out | |

BGP

Ruijie# **clear ip bgp external in**

| clear ip bgp | BGP |
|------------------------------|-----|
| show ip bgp neighbors | BGP |

35.1.35 clear ip bgp flap-statistics

clear ip bgp flap-statistics [*address* [*mask*]]

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

clear ip bgp dampening

Ruijie# **clear ip bgp flap-statistics**

| bgp dampening | |
|----------------------|--|

| | |
|-------------|-----|
| show ip bgp | BGP |
|-------------|-----|

35.1.36 clear ip bgp peer-group

clear ip bgp peer-group *peer-group-name* [**ipv4 unicast**] [[**soft**] [**in** | **out**]]

| | |
|------------------------|-------------------------|
| | |
| <i>peer-group-name</i> | |
| ipv4 unicast | ipv4 |
| in | soft |
| out | soft BGP speaker |
| soft | |
| soft in | |
| soft out | |

BGP

Ruijie# **clear ip bgp peer-group my-group in**

| | |
|---------------------|-----|
| | |
| clear ip bgp | BGP |
| show ip bgp | BGP |

35.1.37 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 |
| ipv4 unicast | ipv4 |
| in | soft |
| out | soft BGP speaker |
| soft | |
| soft in | |
| soft out | |

vrf

BGP

Ruijie# **clear ip bgp vrf my-vrf in**

| clear ip bgp | BGP |
|---------------------|-----|
| show ip bgp | BGP |

35.1.38 default-information originate

no

[no] default-information originate

no

BGP

| network | default-information |
|------------------|----------------------------|
| originate | network |
| IGP | |

Ruijie(config-router)# **default-information originate**



network

no default-metric

BGP

metric BGP metric

r

metric **redistribute metric**
metric
default-metric connected metric
0

Ruijie(config-router)# **default-metric** 45

| | |
|---------------------|--|
| | |
| redistribute | |

35.1.40 distance-bgp

| | | |
|--|-------------------------|--------|
| | network backdoor | 1..255 |
|--|-------------------------|--------|

external-distance 20

internal-distance 200

local-distance 200

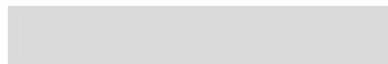
BGP

BGP

1. external-distance IGP (OSPF RIP)

2. internal-distance local-distance IGP

Ruijie(config-router)# **distance bgp 20 20 200**



BGP address-family

bgp address-family bgp

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

| address-family ipv4 | address-family ipv4 |
|---------------------|---------------------|

35.1.42 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 AS 1---500 |
|---------------------------|------------------|
| permit | |
| deny | |
| <i>regular-expression</i> | 1..255 |

BGP

Ruijie(config-router)# **ip as-path access-list hsd deny**
^123\$

| | |
|--------------------------|---------|
| | |
| neighbor filter-list | as-path |
| neighbor distribute-list | |

35.1.43 maximum-prefix

no

maximum-prefix *maximum*

no maximum-prefix

| | |
|----------------|------------------|
| | |
| <i>maximum</i> | <1 - 4294967295> |
| no | |

IPv4 VRF VPNv4 10000.
 IPv4 unicast 4294967295

BGP BGP IPv4 BGP IPv4 VRF BGP
 VPNv4

BGP redistribute
 BGP
 overflow

| | |
|--|-----|
| | |
| clear bgp { <i>addressfamily</i> all } * | BGP |
| show bgp { <i>addressfamily</i> all } summary | BGP |

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

35.1.44 neighbor activate

no

neighbor {*peer-address* | *peer-group-name*} **activate**

no neighbor {*peer-address* | *peer-group-name*} **activate**

| | |
|------------------------|------|
| | |
| <i>peer-address</i> | IPv4 |
| <i>peer-group-name</i> | 32 |

ipv4

BGP BGP IPv4
 BGP BGP VPNv4

BGP IPv4 VRF

ipv4

```
Ruijie(config)# router bgp
```

```
Ruijie(config-router)# neighbor 10.0.0.1
advertisement-interval 10
```

| | |
|--------------------|-----|
| | |
| router bgp | BGP |
| neighbor remote-as | BGP |

35.1.46 neighbor allowas-in

```
PE PE PE AS
no
```

```
neighbor {peer-address | peer-group-name} allowas-in number
no neighbor {[peer-address | peer-group-name] allowas-in
```

| | |
|-----------------|-------------|
| | |
| peer-address | |
| peer-group-name | 32 |
| number | AS [1,10] 3 |

allowas-in

```
BGP BGP IPv4 BGP IPv4VRF
```

```
spoke_hub PE PE
vrf PE vrf CE vrf CE
PE
IBGP EBGP
```

```
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**

| router bgp | BGP |
|---------------------------|-----|
| neighbor remote-as | BGP |

35.1.47 neighbor as-override

PE AS no

neighbor {peer-address | peer-group-name} as-override

no neighbor {peer-address | peer-group-name} as-override

| <i>peer-address</i> | |
|---------------------|--|

peer-group-name 32

```
Ruijie(config-router-af)# neighbor 10.0.0.1
as-override
```

| router bgp | BGP |
|--------------------|-----|
| neighbor remote-as | BGP |

35.1.48 neighbor default-originate

BGP speaker () no

neighbor {peer-address

```
Ruijie(config-router)# neighbor 10.1.1.1  
default-originate
```



```
router bgp
```

| | |
|---------------------------|---------|
| router bgp | BGP |
| neighbor remote-as | BGP () |

35.1.50 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 |
| <i>peer-group-name</i> | 32 |
| <i>access-list-number</i> | ACL |
| in | ACL |
| out | ACL |

BGP BGP IPv4 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 80
```



```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# neighbor 10.0.0.1 remote-as 65100
Ruijie(config-router)# neighbor 10.0.0.1 ebgp-multihop
```

| router bgp | BGP |
|---------------------------|-----|
| neighbor remote-as | BGP |

35.1.52 neighbor filter-list

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> | IPv4 |
|---------------------------|--------------|
| <i>peer-group-name</i> | 32 |
| <i>access-list-number</i> | as-path list |
| in | as-path list |
| out | as-path list |

BGP BGP IPv4
BGP VPNv4

BGP IPv4 VRF

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
```

| router bgp | BGP |
|-------------------------------|--------------|
| neighbor remote-as | BGP |
| ip as-path access-list | AS_PATH list |
| match as-path | AS_PATH list |

35.1.53 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
```

BGP

BGP

BGP BGP IPv4 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
```

| | |
|---------------------------|-----|
| | |
| router bgp | BGP |
| neighbor remote-as | BGP |

35.1.55 neighbor password

BGP BGP TCP MD5
no MD5

neighbor {*peer-address* | *peer-group-name*} **password** [| **0** | **7**] *string*
no neighbor {*peer-address* | *peer-group-name*} **password**

| | |
|------------------------|---------------|
| | |
| <i>peer-address</i> | IPv4 |
| <i>peer-group-name</i> | 32 |
| 0 | |
| 7 | |
| <i>string</i> | TCP MD5 80 |

| | |
|--|----|
| | 32 |
|--|----|

BGP

remote-as update-source local-as reconnect-interval times
 advertise-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

r

EBGP peer-group IBGP
 peer-group

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# neighbor Red-Giant peer-group
Ruijie(config-router)# neighbor 10.0.0.1 peer-group
Red-Giant
```

| | |
|--------------------------------|-----|
| | |
| router bgp | BGP |
| neighbor remote-as | BGP |
| neighbor peer-group (creating) | BGP |
| show ip bgp peer-group | BGP |

35.1.57 neighbor peer-group (creating)

BGP

no

neighbor *peer-group-name* **peer-group**

no neighbor *peer-group-name* **peer-group**

| <i>peer-group-name</i> | 32 |
|------------------------|----|

BGP

BGP

BGP

Ruijie(config)# **router** **bgp** 65000

Ruijie(config-router)# **neighbor** Red-Giant **peer-group**

| router bgp | BGP |
|--|--------------------------|
| neighbor remote-as | BGP |
| neighbor peer-group (assigning members) | BGP BGP |
| show ip bgp peer-group | BGP |

35.1.58 neighbor prefix-list

BGP

no

prefix-list

neighbor {*peer-address* | *peer-group-name*} **prefix-list** *prefix-list-name*
{in | out}

no neighbor {*peer-address* | *peer-group-name*} **prefix-list** {in | out}

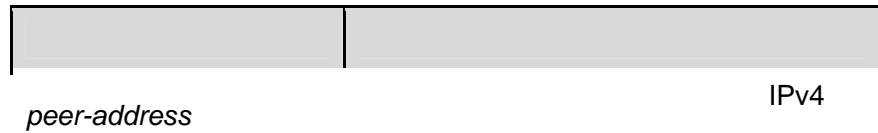
| | |
|-------------------------|------------------------------|
| | |
| <i>peer-address</i> | IPv4 |
| <i>peer-group-name</i> | 32 |
| <i>prefix-list-name</i> | prefix-list IPv4 IPv4 VRF |

V

"

35.1.59 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*



no neighbor {*peer-address* | *peer-group-name*} **remove-private-as**



peer-address

IPv4(6)1()]TJET6.2514 0 B

| | |
|------------------------|------|
| | |
| <i>peer-address</i> | IPv4 |
| <i>peer-group-name</i> | 32 |
| <i>map-tag</i> | |
| in | |
| out | |

BGP BGP IPv4 BGP IPv4 VRF
 BGP VPNv4

```
Ruijie(config-router)# neighbor ip-address route-map
map-tag in
```

| | |
|--|-----|
| | |
| neighbor soft-reconfiguration inbound | BGP |
| show ip bgp | BGP |

35.1.62 neighbor route-reflector-client

no

```
neighbor {ip-address | peer-group-name} route-reflector-client
no neighbor {ip-address | peer-group-name} route-reflector-client
```


| <i>peer-address</i> | IPv4 |
|------------------------|------|
| <i>peer-group-name</i> | 32 |
| both | |
| standard | |
| extended | |

BGP BGP IPv4 BGP IPv4 VRF
 BGP VPNv4

```
Ruijie(config-router)# neighbor 10.1.1.1
send-community both
```

| router bgp | BGP |
|---------------------------|-----|
| neighbor remote-as | BGP |
| ip community-list | |

35.1.64 neighbor shutdown

BGP BGP **no**
 BGP ()

```
neighbor {peer-address | peer-group-name} shutdown
no neighbor {peer-address | peer-group-name} shutdown
```

| | |
|------------------------|------|
| | |
| <i>peer-address</i> | IPv4 |
| <i>peer-group-name</i> | 32 |

BGP BGP IPv4 BGP IPv4 VRF

()

()

BGP

```
Ruijie(config)# router bgp 60
Ruijie(config-router)# neighbor 10.0.0.1 shutdown
```

| | |
|----------------------------|-----|
| | |
| router bgp | BGP |
| neighbor remote-as | BGP |
| show ip bgp summary | BGP |

35.1.65 neighbor soft-reconfiguration inbound

BGP

no

```
neighbor {peer-address | peer-group-name} soft-reconfiguration
inbound
no neighbor {peer-address | peer-group-name} soft-reconfiguration
inbound
```

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

| | |
|------------------------|------|
| <i>peer-address</i> | 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
```

| | |
|------------------------------|-----|
| | |
| router bgp | BGP |
| neighbor remote-as | BGP |
| show ip bgp neighbors | BGP |
| clear ip bgp | BGP |

35.1.66 neighbor soo

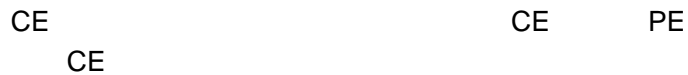
, **no**

```
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> | soo soo_value 1 soo_value as_num nn an_num nn 2 soo_value ip_addr:nn ip_addr IP nn |

soo

BGP IPv4



```

Ruijie(config)# router bgp 65000
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 soo
100:100
  
```

| | |
|-------------------|---------------------------|
| | |
| router bgp | BGP |
| timers bgp | <i>keepalive holdtime</i> |

35.1.67 neighbor timers



```

neighbor [peer-address | peer-group-name] timers keepalive holdtime
no neighbor [peer-address | peer-group-name] timers keepalive
holdtime
  
```

| | |
|------------------------|--------------------------------------|
| | |
| <i>peer-address</i> | IPv4 |
| <i>peer-group-name</i> | 32 |
| <i>keepalive</i> | BGP message KEEPALIVE 0..65535 |
| <i>holdtime</i> | BGP 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

```

| | |
|-------------------|---------------------------|
| | |
| router bgp | BGP |
| timers bgp | <i>keepalive holdtime</i> |

35.1.68 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 route map 32 |

BGP

BGP

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# neighbor 10.0.0.1
unsuppress-map unspress-route
```

| router bgp | BGP |
|---------------------------|-----------|
| neighbor remote-as | BGP |
| aggregate-address | |
| route-map | route-map |

35.1.69 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> | IPv4 |
|------------------------|------|
| <i>peer-group-name</i> | 32 |
| <i>interface-type</i> | |
| <i>interface-index</i> | |

BGP BGP IPv4 BGP IPv4 VRF

loopback BGP BGP

BGP

TCP

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# neighbor 10.0.0.1 update-source
loopback 1
```

| router bgp | BGP |
|---------------------------|-----|
| neighbor remote-as | BGP |

35.1.70 neighbor version

BGP BGP

no

neighbor {*ip-address|peer-group-name*} **version** *number*

no neighbor {*ip-address*|*peer-group-name*} **version** *number*

| <i>peer-address</i> | |
|------------------------|----|
| <i>peer-group-name</i> | 32 |
| <i>number</i> | 4 |

4

BGP

BGP

Ruijie(config-router)# **neighbor 10.1.1.1 version 4**

| router bgp | BGP |
|---------------------------|-----|
| neighbor remote-as | BGP |

35.1.71 neighbor weight

BGP

no

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 |

BGP

IGP

BGP

route-map

```
Ruijie(config)# router bgp 65000
```

```
Ruijie(config-router)# network 10.0.0.1 mask  
255.255.0.0
```

| | |
|--------------------------------|---------|
| | |
| router bgp | BGP |
| redistribute | |
| Network synchronization | Network |

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

| | |
|---------------------|-----|
| | |
| router bgp | BGP |
| redistribute | |
| network(BGP) | |

35.1.74 overflow memory-lack

BGP OVERFLOW no

overflow memory-lack

no overflow memory-lack

| | | | | | |
|----------|--|----------|-----|----------|------|
| | | | | | |
| no | | | BGP | OVERFLOW | |
| | BGP | OVERFLOW | | | |
| BGP | | | | | |
| BGP | OVERFLOW | | | | |
| | BGP | OVERFLOW | | | |
| | | | BGP | OVERFLOW | NULL |
| | clear bgp {addressfamily all} * | | BGP | | BGP |
| OVERFLOW | | | | | |
| no | BGP | OVERFLOW | BGP | | |
| | | | | | |

```

1          BGP      OVERFLOW
Ruijie(config)# router bgp 65000
Ruijie(config-router)# no memory-lack overflow

```

| | |
|--|-----|
| | |
| clear bgp { <i>addressfamily</i> all } * | BGP |
| show bgp { <i>addressfamily</i> all } summary | BGP |

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

35.1.75 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 |
| route-map <i>map-tag</i> | route-map route-map |
| metric <i>metric-value</i> | metric |

BGP

BGP IPv4

BGP IPv4 VRF

IP

```
no redistribute no
```

```
route-map metric route-map route-map route-map  
route-map metric route-map route-map metric
```

```
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
```

| | |
|-------------------|--|
| | |
| show ip protocols | |

35.1.76 redistribute OSPF

```
no OSPF BGP  
redistribute ospf process-id [route-map map-tag] [metric metric-value  
[match internal external]]  
no redistribute ospf process-id [metric metric-value] [match {internal|external}]
```

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

| | |
|-----------------------------------|--------------------------------------|
| <i>process-id</i> | OSPF |
| route-map <i>map-tag</i> | route-map route-map |
| metric <i>metric-value</i> | metric |
| match | OSPF |
| internal | OSPF internal ospf match |
| external [1 2] | OSPF external 1 2 1 2 |
| nssa-external [1 2] | OSPF nssa-external 1 2 1 2 |

OSPF

BGP

BGP IPv4

BGP IPv4 VRF

no

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
```

| | |
|-------------------|--|
| | |
| show ip protocols | |

35.1.77 redistribute ISIS

```
BGP          ISIS          ISIS  
no  
redistribute isis [isis-tag] [route-map map-tag] [metric metric]
```

BGP BGP IPv4

IP

/

no redistribute no

r

ISIS level ISIS
 route-map route-map metric
 route-map route-map route-map metric
 metric

```
Ruijie(config-router)# redistribute isis route-map static-rmap
Ruijie(config-router)# no redistribute isis test route-map isis-rmap
Ruijie(config-router)# no redistribute isis
```

| | |
|-------------------|--|
| | |
| show ip protocols | |

35.1.78 router bgp

BGP BGP
 no BGP

router bgp *as-number*

no router bgp as-number

| | |
|------------------|----------|
| | |
| <i>as-number</i> | 1..65535 |

BGP

BGP

Ruijie(config)# **router bgp 65000**

| | |
|----------------------|-------------|
| | |
| ip routing | IP |
| bgp router-id | BGP |
| network | BGP speaker |

35.1.79 synchronization

BGP IGP **no**
BGP IGP

synchronization
no synchronization

BGP


```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# timers bgp 80 240
```

| | |
|------------------------|---------------------------|
| | |
| neighbor timers | <i>keepalive holdtime</i> |

35.2

35.2.1 show ip bgp

BGP

```
show ip bgp [{network | network-mask}] [longer-prefixes]
```

| | |
|------------------------|--|
| | |
| <i>network</i> | |
| <i>network-mask</i> | |
| longer-prefixes | |

BGP


```
Ruijie# show ip bgp
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
```

35.2.2 show ip bgp cidr-only

show ip bgp cidr-only

Ruijie# **show ip bgp cidr-only**



| | |
|--------------------|---|
| |) no-export local-as no-advertise internet |
| exact-match | |

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> | |
| exact-match | |

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
```



```

Ruijie# show ip bgp dampening dampened-paths
Status codes: s suppressed, d damped, h history, * valid,
> best, i - internal
Origin codes: i - IGP, e - EGP, ? - incomplete
status Network          From          Reuse      Path
-----
*d      192.168.64.0/24      110.110.110.10  00:21:41 1000
i
*d      202.117.121.0/24      110.110.110.10  00:21:43
1000 ?
*d      202.117.122.0/23      110.110.110.10  00:21:43
1000 ?
*d      202.117.122.0/23      110.110.110.10  00:21:43
1000 ?
*d      202.117.122.0/23      110.110.110.10  00:21:43
1000 ?
*d      202.117.122.0/23      110.110.110.10  00:21:43
1000 ?
*d      202.117.122.0/23      110.110.110.10  00:21:43
1000 ?
*d      202.117.122.0/23      110.110.110.10  00:21:43
1000 ?
*d      202.117.122.0/23      110.110.110.10  00:21:43
1000 ?

```

35.2.6 show ip bgp dampening flap-statistics

show ip bgp dampening flap-statistics

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

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*



path-list-number

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> | |
|--------------------------|------|
| received-routes | peer |
| routes | peer |
| advertised-routes | |

[y]h[P]P[AP]D

```
Neighbor capabilities:
  Route refresh: advertised and received (old and new)
  Address family IPv4 Unicast: advertised and received
  Graceful restart: advertised and received
    Remote Restart timer is 120 seconds
  Address families preserved by peer:
    none
Received 14 messages, 0 notifications, 0 in queue
  open message:1 update message:4 keepalive message:9
  refresh message:0 dynamic cap:0 notifications:0
Sent 12 messages, 0 notifications, 0 in queue
  open message:1 update message:3 keepalive message:8
  refresh message:0 dynamic cap:0 notifications:0
Route refresh request: received 0, sent 0
Minimum time between advertisement runs is 0 seconds
For address family: IPv4 Unicast
  BGP table version 2, neighbor version 1
  Index 2, Offset 0, Mask 0x4
  Inbound soft reconfiguration allowed
  8 accepted prefixes
  0 announced prefixes
Connections established 2; dropped 1
Local host: 192.168.195.239, Local port: 1074
Foreign host: 192.168.195.183, Foreign port: 179
Nexthop: 192.168.195.239
Nexthop global: ::
Nexthop local: ::
BGP connection: non shared network
Last Reset: 00:06:43, due to BGP Notification sent
Notification Error Message: (Cease/Unspecified Error Subcode)
```

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

r

```
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

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
```

| router bgp | BGP |
|------------|-----|

35.2.15 show ip bgp vpnv4

vrf rd 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 | |

| | |
|-----------------|----------------------------|
| summary | |
| label | |
| <i>vrf_name</i> | vrf |
| <i>rd_value</i> | RD 100 1 202.118.239.165:1 |

vrf rd vpn

```
Ruijie# show ip bgp vpnv4 all
Network          Nexthop          Metric          Localprf
      Weight          Path
Route Distinguisher 100 2
*>i 192.168.0.1/32 192.168.0.2    0          100
0          10 ?
*>i 192.168.1.0/32 192.168.0.2    0          100
0          ?
Route Distinguisher : 100:30
*>i 192.168.0.1/32 192.168.0.2    0          100
0          10 ?
*> 192.168.4.0 192.168.4.1    0
0          20 ?
* 192.168.4.0 0.0.0.0          0
32768          ?
```

```
Ruijie# show ip bgp vpnv4 vrf vpn1 summary
BGP router identifier 192.168.0.4 , local AS num 100
BGP VRF vrf1 Route Distinguisher 100 30
BGP table version is 1
3 BGP AS PATH entries
0 BGP community entries
Neighbor V AS MsgRcvd Msgsend TblVer IntQ
OutQ Up/Down State/PfxRcd
192.168.4.1 4 20 15 16 1 0 0
00:10:36 3
Total number of neighbors 1
```

```

MPLS BGP          bgp vrf          MP-BGP
                  MP-BGP  vpn        show ip bgp vpv4
vrf                MP-BGP          show ip
bgp vpv4 all

```

35.2.16 show ip as-path-access-list

```
show ip as-path-access-list {num}
```

| | |
|------------|---------------------|
| | |
| <i>num</i> | as-path-access-list |

as-path-access-list

```

Ruijie# show ip as-path-access-list
AS path access list 30
permit ^30$

```

35.2.17 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

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> | |
|---|--------|
| prefix <i>prefix-list-name</i> | |
| gateway <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 10 in fastethernet 0/0
no auto-summary
!
access-list 10 permit 172.16.0.0 0.0.255.255
```

| access-list | |
|--------------------|--|
| prefix-list | |

36.1.2 distribute-list out

distribute-list out **no**

no distribute-list {[*access-list-number* | *name*] | **prefix** *prefix-list-name*}

out [*interface* | *protocol* | *process-id*]

| <i>access-list-number</i> | |
|---------------------------------------|--------|
| prefix <i>prefix-list-name</i> | |
| <i>interface</i> | () |
| <i>protocol</i> | () |

```

)
internet Internet
no-export EBGP
community-number peers
no-advertise
BGP peers
local-as AS
1..255

```



network

| | |
|------------------------------|------------------------|
| <i>prefix-list-name</i> | |
| <i>seq-number</i> | 1 2147483647 5 5 |
| deny | |
| permit | |
| <i>ip-prefix</i> | IP 0 32 |
| <i>minimum-prefix-length</i> |) ge |
| <i>maximum-prefix-length</i> |) le |

```

ip prefix-list IP permit deny
                ge 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

```

ip prefix-list description

no

ip prefix-list sequence-number

```
                                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
```

36.1.8 ip route

ip route no

ip route [**vrf** *vrf_name*] *network net-mask* [*ip-address* | *interface* [*ip-address*]] [*distance*] [**tag** *tag*] [*permanent*] [**weight** *number*] [*disable* | *enable*]

| | |
|-------------------|-----|
| | |
| <i>vrf_name</i> | VRF |
| <i>network</i> | |
| <i>net-mask</i> | |
| <i>ip-address</i> | |
| <i>interface</i> | |
| <i>distance</i> | |
| <i>tag</i> | Tag |

| | |
|-----------------------|--|
| permanent | |
| <i>number</i> | |
| disable/enable | |

```

1
OSPF 110
125 OSPF
vrf vrf
1 show ip route weight
weight weight WCMP
WCMP 32
WCMP

ip
route 0.0.0.0 0.0.0.0 Fastethernet 0/0
Fastethernet 0/0
ARP CPU
172.16.100.0/24
192.168.12.1 115
ip route 172.16.100.0 255.255.255.0 192.168.12.1 115
172.16.100.0/24 fastethernet 0/0

```

| | |
|---------------|---------|
| <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

prefix-list IPv6 **ipv6**
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**

| | |
|------------------------------|----------------|
| permit | |
| <i>ipv6-prefix</i> | IP 0 32 |
| <i>minimum-prefix-length</i> |) ge |
| <i>maximum-prefix-length</i> |) le |

```

ipv6 prefix-list IPv6 permit
deny
ge le

ipv6-prefix ge le
  ipv6-prefix ge
  minimum-prefix-length 32 le
  maximum-prefix-length
  minimum-prefix-length maximum-prefix-length
  ipv6-prefix minimum-prefix-length maximum-prefix-length
  ipv6-prefix < minimum-prefix-length <
  maximum-prefix-length <= 128

```

```

RIP OSPF
IP IPv6
( IP 2222::/64
)

Ruijie# configure terminal
Ruijie(config)# ipv6 prefix-list pre permit 2222::/64
Ruijie(config)# ipv6 router rip
Ruijie(config-router)# distribute-list prefix pre out
ospf
Ruijie(config-router)# end

```

36.1.12 ipv6 prefix-list description

```

IPv6
description no
ipv6 prefix-list prefix-lis-name description descripton-text

```

| | |
|------------------------|------|
| | |
| <i>prefix-lis-name</i> | IPv6 |
| <i>descripton-text</i> | IPv6 |

```

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

```

36.1.13 ipv6 prefix-list sequence-number

```

IPv6
no
ipv6 prefix-list description
Ipv6 prefix-list sequence-number )

```

```
                                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

AS_PATH

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

36.1.15 match community

COMMUNITY

match community **no**

match community {*standard-list-number* | *expanded-list-number* | *community-list-name*} [**exact-match**] [{*standard-list-number* | *expanded-list-number* | *community-list-name*} [**exact-match**] ...]

no match community {*standard-list-number* | *expanded-list-number* | *community-list-name*} [**exact-match**] [{*standard-list-number* | *expanded-list-number* | *community-list-name*} [**exact-match**] ...]

| | |
|--------------------------------------|-----------|
| | |
| <i>standard-list-number</i> | 1...99 |
| <i>expanded-list-number</i> <i>r</i> | 100...199 |
| <i>community-list-name</i> | 80 |
| exact-match | |

match community

6

exact-match

```

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

```

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

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> | |

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...*]}

access-list 10 deny ip 10.1.1.1 0.0.0.0 any

```

                                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

```

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

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...]}

```

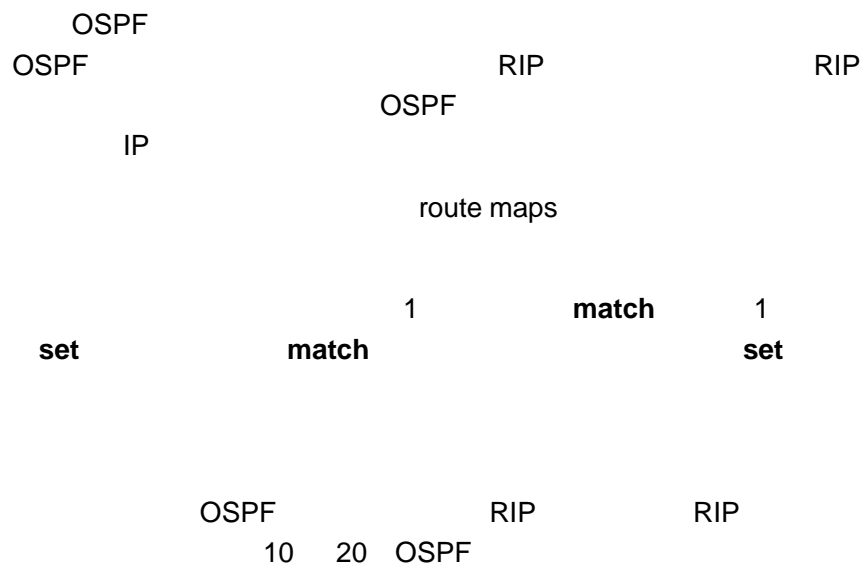
```

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> | |
| prefix-list <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

```

| | |
|--------------------|--|
| | |
| access-list | |

| | |
|------------------------------|--|
| match ip address | |
| match interface | |
| match ip route-source | |
| match metric | |
| match route-type | |
| match tag | |
| set metric | |
| set metric-type | |
| set tag | |

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

match ip route-source

```

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

```

```

      IP                                OSPF                                RIP                                RIP
      OSPF                                5 OSPF

```

```

router ospf
redistribute rip subnets route-map redrip
network 192.168.12.0 0.0.0.255 area 0
access-list 5 permit 192.168.100.1
route-map redrip permit 10
match ip route-source 5

```

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

36.1.20 match ipv6 address

```

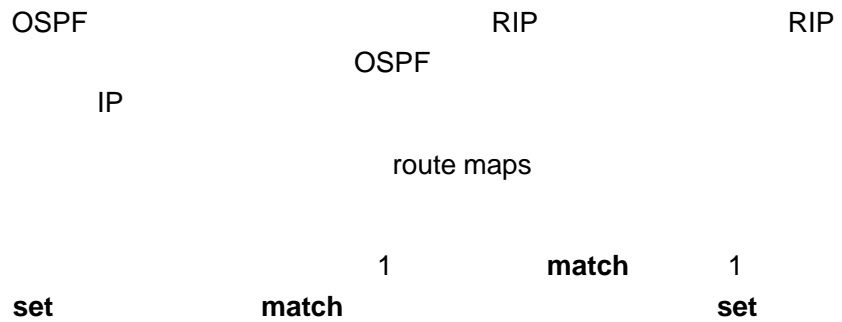
match ipv6 address      IPv6
                        no

```

match ipv6 address { *access-list-name* | **prefix-list** *prefix-list-name* }

no match ipv6 address

| | |
|--|------|
| | |
| <i>access-list-name</i> | |
| prefix-list <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
```

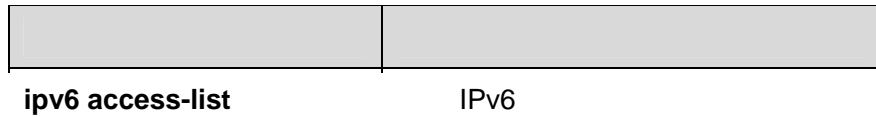


IP OSPF
route maps

set **match** 1 **match** 1 **set**

10 OSPF OSPF RIP
type-1 40

```
ipv6 router ospf
redistribute rip subnets route-map redrip
ipv6 access-list v6acl
10 permit ipv6 2720::/64 any
route-map redrip permit 10
match ipv6 next-hop v6acl
set metric 40
```



36.1.22 match ipv6 route-source

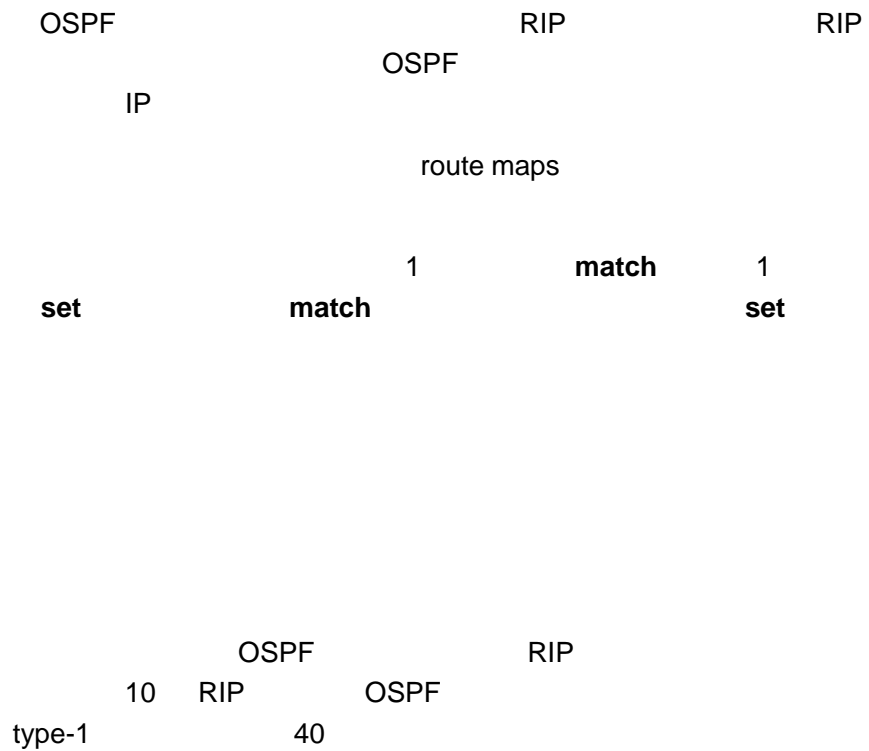
IPv6

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

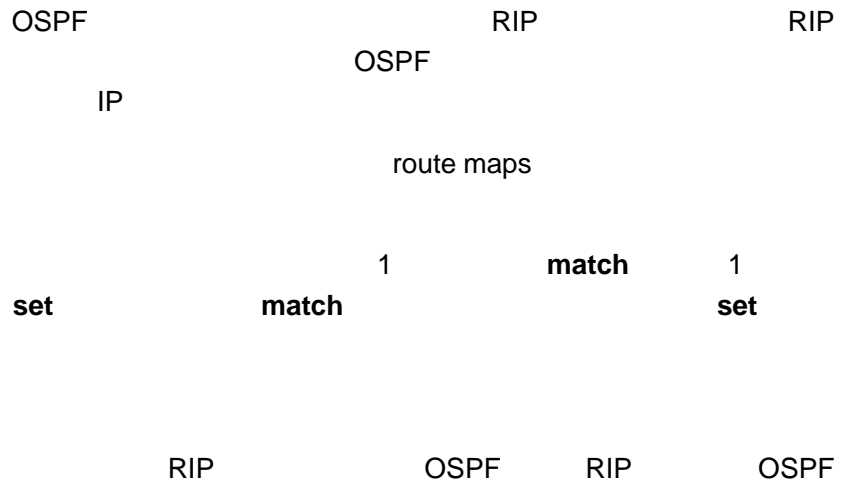


Áp@h*1*+9CÃ%#E-RE>
•ÊÃÖ*+5,XDBN*2E@E> 0
Y6*+2@mRZ@
QkQFeaTq4p21Tq4EoS*ö
5A" 6R<2P@

match origin incomplete
set community no-export

| match as-path | AS_PATH |
|----------------------|---------|
| match metric | |
| match origin | |

set as-path prepend



```

router rip
redistribute ospf route-map redrip
network 192.168.12.0

route-map redrip permit 10
match route-type internal
  
```

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

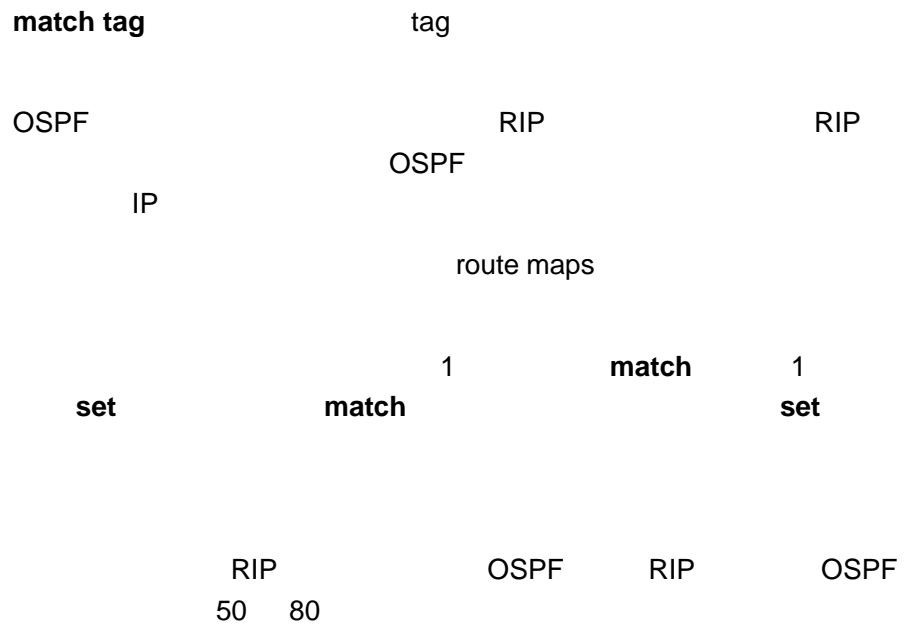
36.1.27 match tag

```

match tag no
  
```

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

| | |
|------------|--|
| | |
| <i>tag</i> | |



```
router rip
redistribute ospf 100 route-map redrip
network 192.168.12.0
```

```
route-map redrip permit 10
match tag 50 80
```

| | |
|-------------------------|--|
| | |
| access-list | |
| match ip address | |

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

36.1.28 maximum-paths

maximum-paths

no

maximum-paths *number*

no maximum-paths *number*

| | |
|---------------|------|
| | |
| <i>number</i> | 1-32 |

32

maximum-paths

show running

config

10

maximum-paths 10

no maximum-paths

36.1.29 route-map

no

route-map

route-map *route-map-name* [**permit** | **deny**] [*sequence-number*]

no route-map *route-map-name* [**permit** | **deny**] [*sequence-number*]

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

RGIOS

OSPF

OSPF

RIP

RIP

IP

| | |
|--------------|--|
| | |
| Redistribute | |

36.1.30 set aggregator as

| |
|----------------------|
| set community |
|----------------------|

| |
|-----------|
| COMMUNITY |
|-----------|

set metric-type


```

match as-path 1
set community 109:10

```

```

route-map SET_COMMUNITY 20 permit
match as-path 2
set community no-export

```

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

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

reuse

EE@0f5511cd090d4721 0.4 Tc 0.0021 Tw[5

```

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

```

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

36.1.35 set extcommunity

```

match
set extcommunity no

```

```

set extcommunity {rt extend-community-value | soo
extend-community-value}

```

```

no set extcommunity {rt | soo}

```

| rt | RT |
|------------|-----|
| soo | SOO |

| | |
|-------------------------------|--|
| <i>extend-community-value</i> | |
|-------------------------------|--|

```

access-list 2 permit 192.168.78.0 255.255.255.0
route-map MAP_NAME permit 10
match ip-address 2
set extcommunity rt 100:2

```

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

36.1.36 set ip default next-hop

```

match IP
set ip next-hop no

```

```

set ip default next-hop ip-address [weight] [...ip-address [weight] ]
no set ip default next-hop ip-address [weight] [...ip-address
[weight] ]

```

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

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

set WCMP WCMP
 WCMP weight
 WCMP
set ip default next-hop IP 32
 ip address weight 4
 nexthop
 next-hop weight set
 WCMP WCMP
 weight nexthop weight
 1
set ip next-hop set ip default next-hop
set ip next-hop set ip
default next-hop
 (nexthop)
 1
 5

```

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
  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 ip default next-hop 8.8.8.8
default interface null0

```

| | |
|---------------------------------|----|
| | |
| route-map | |
| match ip address | |
| set ip default interface | |
| set ip default interface | |
| set ip interface | |
| set ip next-hop | IP |
| set ip precedence | IP |

dscp

```

match ip dscp DSCP
  set ip dscp dscp_value
no match ip dscp
no set ip dscp

```

| | |
|--------------------------------|----|
| | |
| route-map | |
| match ip address | |
| set default interface | |
| set default interface | |
| set interface | |
| set ip default next-hop | IP |
| set ip precedence | 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
                        WCMP                weight
set ip next-hop        IP                32
      ip address        weight                4
next-hop
      next-hop        weight                set
      WCMP                WCMP                weight
      weight        next-hop                weight
1
      match

```

1

set

```

      serial 1/0
10.0.0.0/8                192.168.100.1
172.16.0.0/16            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

```

| | |
|--------------------------------|----|
| | |
| route-map | |
| match ip address | |
| set default interface | |
| set default interface | |
| set interface | |
| set ip default next-hop | IP |
| set ip precedence | IP |

36.1.39 set ip next-hop verify-availability

```

IP
next-hop verify-availability no set ip

```

```

set ip next-hop verify-availability ip-address track track-object-num
no set ip next-hop ip-address [weight] [...ip-address [weight] ]

```

| | |
|-------------------------|----|
| | |
| <i>ip-address</i> | IP |
| <i>track-object-num</i> | |

```

serial 1/0
10.0.0.0/8 192.168.100.1
172.16.0.0/16 172.16.100.1

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
```

| | |
|-------------------------|--|
| | |
| route-map | |
| match ip address | |

set default interface

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
```

| match interface | |
|------------------------------|--|
| match ip address | |
| match ip next-hop | |
| match ip route-source | |

match metric

local-preference

local-preference

```
route-map SET_PREF permit 10  
match as-path 1  
set local-preference 6800
```

```
route-map SET_PREF permit 20  
match as-path 2  
set local-preference 50
```

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

```

set metric 1-16 + - metric metric
RIP OSPF RIP RIP
OSPF OSPF
IP
route maps
set match 1 match 1 set
OSPF RIP
40

```

```

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 metric 40

```

| | |
|------------------------|--|
| match tag | |
| set metric-type | |
| set tag | |

36.1.43 set metric-type

match
set metric-type **no**
set metric-type *type*
no set metric-type

| | |
|-------------|--|
| | |
| <i>type</i> | |

```

route-map redrip permit 10
set metric-type type-1

```

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

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

OSPF

RIP

RIP

IP OSPF

route maps

set **match** 1 **match** 1 **set**

192.168.1.2

```
route-map redrip permit 10
match ip address 1
set next-hop 192.168.1.2
```

| | |
|--------------------------|--|
| | |
| match interface | |
| match ip address | |
| match ip next-hop | |

| | |
|----------------|--|
| | |
| <i>ip-addr</i> | |

```

route-map SET_ORIGIN 10 permit
match as-path 1
set originator-id 5.5.5.5
route-map SET_ORIGIN 20 permit
match as-path 2
set originator-id 5.5.5.6

```

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

36.1.47 set tag

```

match
no
set tag tag
no set tag
set tag

```

| | |
|------------|--|
| | |
| <i>tag</i> | |

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

```

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

set metric-type

show route-map

show route-map *route-map-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**]]

| | |
|----------------------------|---|
| | |
| vrf <i>vrf_name</i> | VRF |
| <i>network</i> | |
| <i>mask</i> | |
| count | |
| protocol | static connected, bgp, isis, ospf, rip |
| <i>process-id</i> | |
| weight | |

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
S
R RIP
B BGP
O OSPF
i IS-IS

E1 OSPF
E2 OSPF
N1 OSPF NSSA

E2

20.0.0.0/8

[1/0]

| | |
|--------------|----|
| 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, ago, ago, ago, ago, ago, ago,
```

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

r . .

```

                                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

```

| | |
|--------------------------------|--|
| | |
| load-balance redundance | |

set ip next-hop

4 ECMP 32 WCMP
 ARP

nexthop,

EF0

nexthop

```

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
set ip next-hop 196.168.4.7
set ip next-hop 196.168.4.8
exit
route-map lab1 permit 20
match ip address 2
set ip next-hop 196.168.5.6
set ip next-hop 196.168.5.7
set ip next-hop 196.168.5.8
exit
interface FastEthernet 0/0
ip policy route-map lab1
exit
ip policy redundance

```

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

```

ruijie(config-if)#
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

```

38.1.3 ipv6 enable

```

IPV6 no IPV6
ipv6 enable
no ipv6 enable
IPV6
2 IPV6 ipv6 enable
, IPV6

```

IPv6 IPv6
no ipv6 enable IPV6

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

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

38.1.4 ipv6 hop-limit

ipv6 hop-limit value

no ipv6 hop-limit

64

Ruijie(config)# **ipv6 hop-limit 100**

38.1.5 ipv6 neighbor

no

ipv6 neighbor *ipv6-address interface-id hardware-address*

no ipv6 neighbor *ipv6-address interface-id*

ipv6-address IPV6 RFC2373

interface-id Routed Port,L3 AP
 SVI

hardware-address XXXX.XXXX.XXXX
48 MAC 'X'

ARP IPv6
NDP
Reachble
clear ipv6 neighbors (NDP)

~~clear ipv6 neighbors~~
~~show ipv6 neighbors~~
clear ipv6 neighbors (Ti/Tt3 1 Tf 62.0686l314171 TD 0 Tc 0 Tw a23d94c3d087c15d5113

Ruijie(config)# **ipv6 neighbor 2001::1 vlan 1**
00d0.f811.1111



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  
prefix-length IPV6
```

RFC2373

```
r . . .
```

S86

[0,64]

[128,128]

```
ipv6-address
```

RFC2373

```
interface-id
```

Ruijie(config)# **ipv6 route 2001::/64 vlan 1 2005::1**

| | |
|------------------------|------|
| | |
| show ipv6 route | 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**

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

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

```


38.1.13 ipv6 nd ra-interval

```

(RA)
no
ipv6 nd ra-interval {seconds | min-max min_value max_value}
no ipv6 nd ra-interval

seconds          (RA)          3-1800s
min-max:
min_value:
max_value:

200              200          20

```

min-max

```

Ruijie(config)# interface vlan 1
Ruijie(config-if)# ipv6 nd ra-interval 110
Ruijie(config-if)# ipv6 nd ra-interval min-max 110 120

```

| show ipv6 interface | ra-info |
|----------------------------|----------------|
| ipv6 nd ra-lifetime | |
| ipv6 nd ra-hoplimit | |
| ipv6 nd ra-mtu | MTU |

38.1.14 ipv6 nd ra-hoplimit

```

no
(RA)
ipv6 nd ra-hoplimit value
no ipv6 nd ra-hoplimit

value (RA)

64

```

```

Ruijie(config)# interface vlan 1
Ruijie(config-if)# ipv6 nd ra-hoplimit 110

```

| show ipv6 interface | ra-info |
|---------------------|---------|
| ipv6 nd ra-lifetime | |
| ipv6 nd ra-interval | |
| ipv6 nd ra-mtu | MTU |

38.1.15 ipv6 nd ra-mtu

```

no
(RA) MTU
ipv6 nd ra-mtu value
no ipv6 nd ra-mtu

```

value

(RA)

MTU

0-4294967295

IPv6 MTU

```
Ruijie(config)# int vlan 1
Ruijie(config)# ipv6 nd managed-config-flag
```

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

38.1.17 ipv6 nd dad attempts

```

                                IPV6
                                (NS)
                                no
ipv6 nd dad attempts value
no ipv6 nd dad attempts

value      (NS)                0
           ipv6                : 0-600

1

```

```

                                IPV6
                                "tentative"( )
                                EUI-64

                                (
                                IPV6
                                down/up
                                down    up

```

```
Ruijie(config)# interface vlan 1
Ruijie(config-if)# ipv6 nd dad attempts 3
```

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

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

```

| | |
|----------------------------|---------|
| | |
| show ipv6 interface | 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
```


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

38.1.20 clear ipv6 neighbors

clear ipv6 neighbors

RDP

```
Ruijie# clear ipv6 neighbors
```



```

ruijie# tunnel mode ipv6ip
(6to4 isatap)

```

```

Ruijie# show tunnel
IPv6 tunnel :
Ruijie(config)# interface tunnel 1
Ruijie(config-if)# tunnel mode ipv6ip
Ruijie(config-if)# tunnel source vlan 1
Ruijie(config-if)# tunnel destination 192.168.5.1

```

| | |
|----------------------|-----|
| | |
| tunnel source | |
| tunnel mode | |
| tunnel ttl | TTL |

38.1.23 tunnel source

```

Ruijie# show tunnel
, no
Ruijie# show tunnel
tunnel source {ipv4-address | interface-type interface-number}
no tunnel source
Ruijie# show tunnel
ipv4-address IPv4 IPv4

```

interface-type interface-number

IPv4

IPv4

IPv4 , IPv4
(6to4 isatap)

r . .

IPv6

```
Ruijie(config)# interface tunnel 1
Ruijie(config-if)# tunnel mode ipv6ip
Ruijie(config-if)# tunnel source vlan 1
Ruijie(config-if)# tunnel destination 192.168.5.1
```

| | |
|---------------------------|-----|
| | |
| tunnel mode | |
| tunnel destination | |
| tunnel ttl | 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
```

| tunnel mode | |
|---------------------------|--|
| tunnel source | |
| tunnel destination | |

38.2

38.2.1 show ipv6 route

IPV6

show ipv6 route [static] [local] [connected]

static

local

connected

```
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
L   fe80::200:ff:fe00:1/128
    via ::, loopback 0
C   fe80::/64
    via ::, vlan 2
```

| | |
|------------|--|
| | |
| ipv6 route | |

38.2.2 show ipv6 neighbors

IPV6

show ipv6 neighbors [**verbose**] [*interface-id*] [*ipv6-address*]

verbose

interface-id

ipv6-address

| | |
|-------|---|
| | MAX_UNICAST_SOLICIT(3) ?— /R— /H— |
| Age | 'expired' NUD |
| Asked | (NS) |

Ruijie# **show ipv6 neighbors**

| | |
|----------------------|--|
| | |
| ipv6 neighbor | |

38.2.3 show ipv6 interface

IPV6

show ipv6 interface [*interface-id*] [**ra-info**]

interface-id

aggregateport

SVI

ra-info

RA

IPV6

ND

```

INET6: 2001::1 , subnet is 2001::/64 [TENTATIVE]
Joined group address(es):
ff01:1::1
ff02:1::1
ff02:1::2
ff02:1::1:ff00:1
MTU is 1500 bytes
ICMP error messages limited to one every 10 milliseconds
ICMP redirects are enabled
ND DAD is enabled, number of DAD attempts: 1
ND reachable time is 30000 milliseconds
ND advertised reachable time is 0 milliseconds
ND retransmit interval is 1000 milliseconds
ND advertised retransmit interval is 0 milliseconds
ND router advertisements are sent every 200
seconds<240--160>
ND router advertisements live for 1800 seconds

```

```

                INET6: 2001::1 , subnet is 2001::/64
[TENTATIVE]          INET6          []

```

| | |
|------------|--------|
| | |
| ANYCAST | |
| TENTATIVE | (DAD), |
| DUPLICATED | |
| DEPRECATED | |
| NODAD | |
| AUTOIFID | EUI-64 |

```

Ruijie# show ipv6 interface vlan 1 ra-info
vlan 1: DOWN
RA timer is stopped
waits: 0, initcount: 3
statistics: RA(out/in/inconsistent): 4/0/0, RS(input):
0
Link-layer address: 00:00:00:00:00:01
Physical MTU: 1500
ND router advertisements live for 1800 seconds
ND router advertisements are sent every 200
seconds<240--160>

```

```
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)
```

| | |
|------------|--------------------|
| Def | |
| Auto CFG | Auto IPV6 , CFG |
| !Adv | |
| vlttime | () |
| pltime | () |
| L !L | L on-link !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

```

| | |
|----------------|-----------------|
| | |
| <i>area-id</i> | stub IPv4 |
| <i>cost</i> | stub 1-16777214 |

```

default-cost 1

```

OSPFv3

```

Stub ABR

```

```

stub 50 100

```

```

ipv6 router ospf 1
area 50 stub
area 50 default-cost 100

```

| | |
|----------------------------|--------|
| | |
| area stub | stub |
| show ipv6 ospf area | OSPFv3 |


```

no          stub          Stub
no          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 3 LSA 3 LSA | ABR stub |

Stub

OSPFv3

```

no area area-id stub
no area area-id ( )
stub ABR 3 LSA
stub NSSA ABR no-su
mmmary 3 LSA NSSA
    
```

Stub 10 ABR Stub

```

ipv6 router ospf 1
area 10 stub
area 10 stub no-summary
    
```

| | |
|----------------------------|--------|
| | |
| area default-cost | Stub |
| show ipv6 ospf area | OSPFv3 |

39.1.4 area virtual-link

no

area *area-id* **virtual-link** *router-id* [**hello-interval** *seconds*]
 [**dead-interval** *seconds*] [**retransmit-interval** *seconds*]
 [**transmit-delay** *seconds*] [**instance** *instance-id*]

no area *area-id* **virtual-link** *router-id* [**hello-interval**]
 [**dead-interval**][**retransmit-interval**] [**transmit-delay**] [**instance**]

| <i>area-id</i> | | IPv6 |
|---|----------|----------------|
| <i>router-id</i> | | (router-ID) |
| hello-interval <i>seconds</i> | 1-65535 | hello 10 |
| dead-interval <i>seconds</i> | 1-65535 | hello-interval |
| retransmit-interval <i>seconds</i> | 1-65535 | LSA 5 |
| transmit-delay <i>seconds</i> | 1-65535 | LSA 1 |
| instance <i>instance-id</i> | instance | instance |

OSPFv3

OSPF

OSPF

r ·

```

'                               stub          NSSA
'                               hello-interval  dead-interval
instance
'   no area area-id            (           )

```

```

ipv6 router ospf 1
area 1 virtual-link 192.1.1.1

```

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

39.1.5 auto-cost

OSPF

no

auto-cost [reference-bandwidth *ref-bw*]

no auto-cost [reference-bandwidth]

| reference-bandwidth | 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

```

| | |
|-----------------------|--------|
| | |
| ipv6 ospf cost | |
| show ipv6 ospf | 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*]

| | |
|----------------------------------|--------------------------|
| | |
| always | OSPF |
| metric <i>metric</i> | 1 |
| metric-type <i>type</i> | OSPF 1 2 1 2 |
| route-map <i>map-name</i> | route-map , route-map |

OSPFv3

redistribute **default-information** **metric** **metric-type** **route-map**

default-information originate always

| | |
|--------------------------------|--------|
| | |
| redistribute | |
| show ipv6 ospf | OSPFv3 |
| show ipv6 ospf database | 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

| | |
|-----------------------|--------|
| | |
| redistribute | |
| show ipv6 ospf | 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 |
| area <i>area-id</i> | OSPFv3 IPv6 |
| instance <i>instance-id</i> | OSPFv3 |

```

router ospf      OSPFv3
                 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
    
```

| | |
|--------------------------------|--------|
| | |
| ipv6 ospf prefix-filter | |
| ipv6 router ospf | OSPFv3 |

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() |
| instance <i>instance-id</i> | OSPFv3 |

ip ospf hello-interval 4

hello 4 hello

1. hello
- 2.

Hello

no

ipv6 ospf hello-interval *seconds* [**instance** *instance-id*]**no ipv6 ospf hello-interval** [**instance** *instance-id*]

| | |
|------------------------------------|---------------------|
| | |
| <i>seconds</i> | Hello 1-65535() |
| instance <i>instance-id</i> | OSPFv3 |

10

Hello

hello

20s

ipv6 ospf hello-interval 20

| | |
|------------------------------------|--------|
| | |
| ipv6 ospf dead-interval | |
| show ipv6 ospf interface | OSPFv3 |
| instance <i>instance-id</i> | OSPFv3 |

39.1.13 ipv6 ospf neighbor

OSPFv3

no

ipv6 ospf neighbor *ipv6-address* [[**cost** <1-65535>] [**poll-interval** <0-4294967295> | **priority** <0-255>]] [**instance** *instance-id*]**no ipv6 ospf neighbor** *ipv6-address* [[**cost** <1-65535>] [**poll-interval** <0-4294967295> | **priority** <0-255>]] [**instance** *instance-id*]

| cost <1-65535> | point-to-multipoint cost |
|--|-----------------------------|
| poll-interval <0-4294967295> | 120 Non-broadcast(NBMA) |
| priority <0-255> | Non-broadcast(NBMA) |
| instance <i>instance-id</i> | OSPFv3 |

39.1.14 ipv6 ospf network

no

ipv6 ospf network {broadcast | non-broadcast | point-to-point |
point-to-multipoint [non-broadcast]} [instance *instance-id*]

no ipv6 ospf network [broadcast | non-broadcast | point-to-point |
point-to-multipoint [non-broadcast]] [instance *instance-id*]

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

OSPFv3

```
ipv6 ospf network point-to-point
```

| ipv6 ospf priority | |
|------------------------------------|--------|
| show ipv6 ospf interface | OSPFv3 |
| instance <i>instance-id</i> | OSPFv3 |

39.1.15 ipv6 ospf priority

no

```
ipv6 ospf priority number-value [instance instance-id]
```

```
no ipv6 ospf priority [instance instance-id]
```

| <i>number-value</i> | 0-255 1 |
|------------------------------------|---------|
| instance <i>instance-id</i> | OSPFv3 |

1

```

DR/BDR( / )
DR/BDR DR BDR
Router-ID DR BDR
DR/BDR
DR BDR
DR BDR
DR/BDR DR BDR
ipv6 ospf priority 0
    
```

| | |
|------------------------------------|--------|
| | |
| ipv6 ospf network | |
| router-id | |
| show ipv6 ospf interface | OSPFv3 |
| instance <i>instance-id</i> | 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]
    
```

| | |
|------------------------------------|-------------------|
| | |
| <i>seconds</i> | LSA 1-65535() |
| instance <i>instance-id</i> | OSPFv3 |

LSA

LSA

LSA

10s

```
ipv6 ospf retransmit-interval 10
```



show ipv6 ospf interface

OSPFv3

Red

| | |
|---------------------------------|--------|
| | |
| show ipv6 ospf interface | 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

| | |
|-----------------------|--------|
| | |
| ipv6 ospf area | OSPFv3 |
| show ipv6 ospf | OSPFv3 |

39.1.19 log-adj-changes

no default

log-adj-changes [detail]

no log-adj-changes [detail]

| detail | |
|---------------|--|

FULL

```
Ruijie(config)# router ospf 1  
Ruijie(config-router)# log-adj-changes detail
```

| show ipv6 ospf | ospf |
|-----------------------|------|

39.1.20 max-concurrent-dd

DD

```
max-concurrent-dd number  
no max-concurrent-dd
```



39.1.22 redistribute

OSPFv3

no

redistribute *protocol* [**metric** *metric-value*] [**metric-type** *type-value*][**route-map** *map-tag*] [**match** [**internal** | [**external** | **nssa-external** [1|2]]]]]

no redistribute *protocol* [**metric**][**metric-type**][**route-map**] [**match** [**internal** | [**external** | **nssa-external** [1|2]]]]]

```

OSPF
    route-map
        match
            tag metric metric-type
        set
route-map
    metric 20
    set metric 30
    redistribute connect metric 10 route-map test
    metric 20
    metric 30
    OSPF
    OSPF
    route-map test
    match
    metric 20
    metric
    
```

| | |
|--------------------------------------|--------|
| | |
| default-information originate | |
| default-metric | |
| summary-prefix | |
| show ipv6 ospf | OSPFv3 |
| show ipv6 ospf database | OSPFv3 |

39.1.23 router-id

```

Router ID (Router ID) no
Router ID Router ID
router-id router-id
no router-id

```



```

ID      OSPFv3      Router ID      Router
        IPv4
        OSPFv2  OSPFv2      IPv4      Router ID
          OSPFv3      Router-id      OSPFv3
          Router ID      OSPFv3
                    Router ID
                    OSPFv3      OSPFv3
          Router ID      OSPFv3
          Router ID      Router ID  OSPFv3
          OSPF
                    Router ID      OSPFv3
          Router ID
                    OSPFv3      1.1.1.1
router-id 1.1.1.1
    
```

| | |
|---------------------------|--------|
| | |
| ipv6 ospf priority | |
| show ipv6 ospf | OSPFv3 |

39.1.24 timers spf

```

        OSPFv3      SPF
        SPF      timers spf
        no
timers spf delay holdtime
no timers spf
    
```

| | |
|-----------------|---------------------------|
| | |
| <i>delay</i> | SPF 0-214748364 () 5 |
| <i>holdtime</i> | SPF 0-214748364 () 10 |

```
spf-delay 5
spf-holdtime 10
```

OSPFv3

```
spf-delay spf-holdtime OSPF
```

```
timers spf 2 4
```

| clear ipv6 ospf | OSPFv3 |
|------------------------|--------|
| show ipv6 ospf | 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 Adjacency Changes : Enabled
Number of areas in this router is 2
Area BACKBONE(0)
Number of interfaces in this area is 1(1)
SPF algorithm executed 4 times
Number of LSA 3. Checksum Sum 0x1DDF1
Number of Unknown LSA 0

OSPFv3 BFD ,

| | |
|-----------------------|--|
| default-metric | |
|-----------------------|--|

```

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

OSPFv3

```
Ruijie# show ipv6 ospf interface
FastEthernet 1/0 is up, line protocol is up
Interface ID 2
IPv6 Prefixes
fe80::2d0:22ff:fe22:2223/64 (Link-Local Address)
OSPFv3 Process (1), Area 0.0.0.0, Instance ID 0
Router ID 1.1.1.1, Network Type BROADCAST, Cost: 1
Transmit Delay is 1 sec, State BDR, Priority 1
Designated Router (ID) 2.2.2.2
Interface Address fe80::c800:eff:fe84:1c
Backup Designated Router (ID) 1.1.1.1
Interface Address fe80::2d0:22ff:fe22:2223
smit Delay i74-TD
```

| | |
|-------------------------|--------|
| | |
| ipv6 router ospf | OSPFv3 |
| ipv6 ospf area | OSPFv3 |

39.2.4 show ipv6 ospf neighbor

OSPFv3

show ipv6 ospf [*process- id*] **neighbor** [*interface-type*
interface-number [**detail**]] [*neighbor-id*] [**detail**]

| | |
|--------------------|-------------------|
| | |
| <i>process- id</i> | OSPFv3 , 1-65535. |
| <i>detail</i> | |

y n Ú È H I L h S ~~interface-type~~

```

Database Summary List 0
Link State Request List 0
Link State Retransmission List 0
      BFD
BFD session state up
Ruijie# show ipv6 ospf neighbor detail
Neighbor          2.2.2.2,          interface          address
fe80::c800:eff:fe84:1c
In the area 0.0.0.0 via interface FastEthernet 1/0
Neighbor priority is 1, State is Full, 6 state changes
DR is 2.2.2.2 BDR is 1.1.1.1
Options is 0x000013 (-|R|-|-|E|V6)
Dead timer due in 00:00:36
Database Summary List 0
Link State Request List 0
Link State Retransmission List 0
BFD session state up

```

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


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-interval
' ip igmp limit (          )
' ip igmp query-interval
' ip igmp query-max-responese-time
' ip igmp querier-timeout
' ip igmp robustness-variable
' ip igmp version
' ip igmp limit (          )
' ip igmp proxy-service
' ip igmp mroute-proxy
' ip igmp ssm-map enable
' ip igmp ssm-map static
' show ip igmp groups
' show ip igmp interface
' show ip igmp ssm-mapping
```

40.1.1 clear ip igmp group

IGMP

clear ip igmp group[*group-address* | *interface-type interface-number*]

| | | | | |
|-------------------------|----|----|---|---|
| | | | | |
| <i>group-address</i> | 32 | IP | D | 8 |
| <i>interface-type</i> | | | | |
| <i>interface-number</i> | | | | |

IGMP

IGMP

clear ip igmp group

Ruijie# **clear ip igmp group**

show ip igmp groups

show ip igmp interface

40.1.2 clear ip igmp interface

IGMP

clear ip igmp interface *ifname*

| | |
|---------------|--|
| | |
| <i>ifname</i> | |
| | |

IGMP

ifname

```
Ruijie# clear ip igmp interface gigabitEthernet 4/1
```

40.1.3 ip igmp access-group

no

```
ip igmp access-group access-list
```

```
no ip igmp access-group
```

| <i>access-list</i> | , <1-199> <1300-2699> WORD |
|--------------------|-----------------------------------|

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 233.3.3.3 .

Ruijie# **configure terminal**

Ruijie(config)# **interface ethernet 0**

Ruijie(config-if)# **ip igmp join-group 233.3.3.3**

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

40.1.5 ip igmp static-group

no

ip igmp static-group *group-address*

no ip igmp static-group *group-address*

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

| | |
|----------------------|--|
| <i>group-address</i> | |
|----------------------|--|

Eth0 236.6.6.6

```
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

IGMPv2 ip igmp
last-member-query-count

3.

```
Ruijie# configure terminal  
Ruijie(config)# interface ethernet 0  
Ruijie(config-if)# ip igmp last-member-query-count 3
```

40.1.8 ip igmp last-member-query-interval

no

ip igmp last-member-query-interval *interval*
no ip igmp last-member-query-interval



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 1-16384 |
|--------------------|-----------------------------|
| except | <i>access-list</i> limit |
| <i>access-list</i> | |

1024

IGMP
IGMP

300

Ruijie(config-if)# **ip igmp limit 300**

40.1.10 ip igmp query-interval

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

| | |
|-------------|-------|
| {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*]

| | |
|--------------------|-----------------------------|
| | |
| <i>number</i> | IGMP |
| except | <i>access-list</i> limit |
| <i>access-list</i> | |

65536

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* |

| | |
|-------------------------|--|
| <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 ip pimquery-in6 0vale
' ip pimstate-refresh disable
' ip pimstate-refresh origination-in6se0vale
'
```

```

PIM-DM
PIM-DM
PIM-DM      IGMP

Failed to enable PIM-DM on < >,
resource temporarily unavailable, please try again

PIM-DM Configure failed! VIF limit
exceeded in NSM!!!

PIM-DM
PIM-DM  PIM-SM  DVMRP
v4

```

41.1.2 ip pim neighbor-filter

```

ip pim neighbor-filter
PIM-DM

Peering

no

ip pim neighbor-filter access-list
no ip pim neighbor-filter access-list

```

| | |
|--------------------|--|
| | |
| <i>access-list</i> | |

```
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

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
```

```
r . . . . .
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

50.50.50.50 VLAN 4 2 v2/D 1

PIM-DM

PIM-DM

show ip pim dense-mode mroute**show ip pim dense-mode mroute [A.B.C.D A.B.C.D] [summary]**

| | |
|------------------------|--|
| | |
| <i>A.B.C.D A.B.C.D</i> | |
| summary | |

/ /

PIM-DM

```

Ruijie# show ip pim dense-mode mroute
PIM-DM Multicast Routing Table
(1.1.1.111, 229.1.1.1)
MRT lifetime expires in 205 seconds
RPF Neighbor: 50.50.50.1, Nexthop:50.50.50.1,VLAN 4
Upstream IF: VLAN 4
Upstream State: Pruned, PLT:200
Assert State: NoInfo
Downstream IF List:
FastEthernet 0/45:
Downstream State: NoInfo
Assert State: Loser, AT:170

```


- ' **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> <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> <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
```

42.1.3 clear ip pim sparse-mode bsr rp-set

clear ip pim sparse-mode bsr rp-set *

| | |
|---|--------|
| | |
| * | RP-SET |

RP

```
Ruijie# clear ip pim sparse-mode bsr rp-set *
```

42.1.4 ip multicast-routing

ip multicast-routing

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 <2000 2699> | <100 199> 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>access-list</i> | <code>access-list <1 99> <1300 1999></code> <code>acl</code> <code>group-list access-list</code> |
|--------------------|--|

PIM
PIM PIM
 cisco

PIM
PIM

```
Ruijie# configure terminal
Ruijie(config)#ip pim cisco-register-checksum
Ruijie(config)#ip pim cisco-register-checksum
group-list 99
Ruijie(config)# access-list 99 permit 225.1.1.1
0.0.0.255
```

access-list

42.1.8 ip pim dr-priority

ip pim dr-priority *priority-value*

| | |
|-----------------------|-------------------------------------|
| | |
| <i>priority-value</i> | <code><0-4294967294></code> 1 |

DR 1

```

      DR
    '
      DR          Hello          DR
          IP          DR
    '
          Hello          DR
      DR          IP          DR
  
```

```

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

```

  Ð
  
```


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

42.1.13 ip pim query-interval

ip pim query-interval *interval-seconds*

| | |
|-------------------------|-----------|
| | |
| <i>interval-seconds</i> | <1-65535> |

Hello 30s

```

Hello           Hello
Hello Hello           Hello           3.5
Hello           * 3.5 > 65535 Hello
65535           Hello
```

```
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*

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

S G

DR RP

```
Ruijie# configure terminal
Ruijie(config)# ip pim register-rate-limit 3000
```

42.1.15 ip pim register-rp-reachability

ip pim register-rp-reachability

RP

ip pim register-suppression *seconds*

| | |
|----------------|------------|
| | |
| <i>seconds</i> | <11-21843> |

60

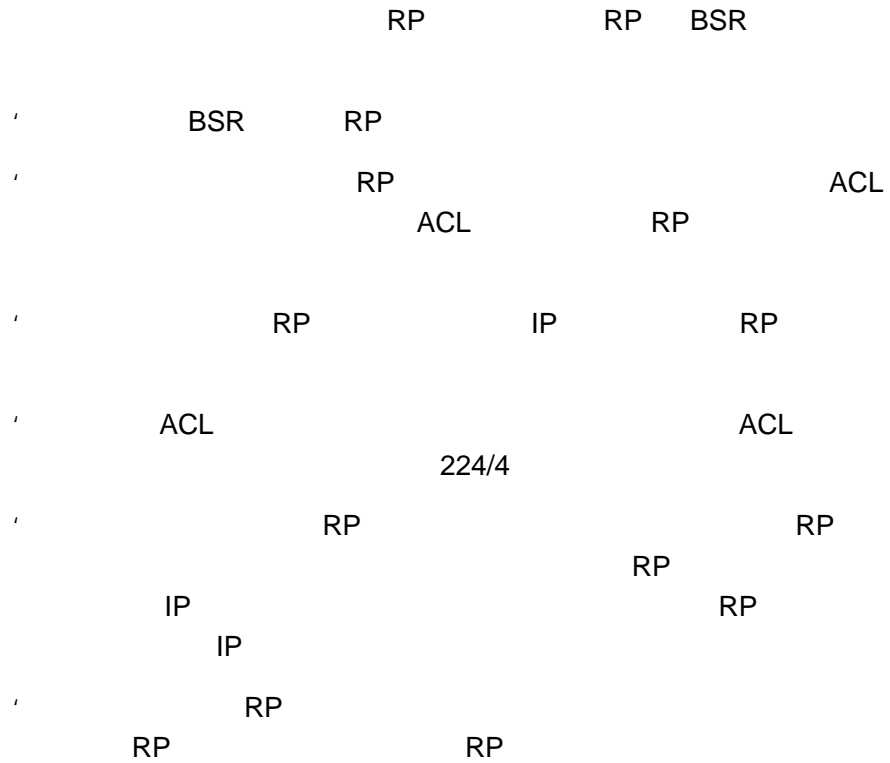
DR RP ip pim
 rp-register-kat RP RP keepalive

```
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> | access-list <1300-1999> | acl acl | <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 192 |

| | | | |
|--------------------|-------------------------------|------|-----|
| <i>access_list</i> | acl group-list access_list | 1-99 | acl |
|--------------------|-------------------------------|------|-----|

RP

```

PIM-SM          RPT      RP
BSR              C-RP    BSR      C-RP
BSR      PIM

RP              ace      acl
permit         deny
ace
    
```

```

Ruijie# configure terminal
Ruijie(config)# ip pim rp-candidate g 0/3
Ruijie(config)# ip pim rp-candidate g 0/3 priority 200
group-list 3 interval 70
Ruijie(config)# access-list 3 permit 225.1.1.1
0.0.0.255
    
```

access-list

42.1.20 ip pim rp-register-kat

ip pim rp-register-kat seconds

| | | |
|----------------|-----|-----------|
| | KAT | <1-65535> |
| <i>seconds</i> | | |

RP KAT 210s

42.1.22 ip pim spt-threshold

ip pim spt-threshold [*group-list access-list*]

| | | | |
|--------------------|---|------------|------|
| | | | |
| <i>access-list</i> | access-list 1300-1999 group-list access-list SPT | acl 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

```


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 |

/ /

metric

1 ~~e~~ rp.38 510.138 0 0 13.56()Tj/TT33542>1 Tf13.98 0 0 []8057 Tca1101c

RP

```
Ruijie# show ip pim sparse-mode rp-hash 225.1.1.1  
RP: 30.30.100.1  
Info source: 30.30.100.1, via bootstrap
```

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

| show ip mroute | |
|-----------------------|--|

43.1.2 clear ip mroute statistics

IP

clear ip mroute statistics {* | *group-address* [*source -address*]}

| * | |
|------------------------|--|
| <i>group-address</i> | |
| <i>source -address</i> | |

IP

230.0.0.1

Ruijie# **clear ip mroute statistics** 230.0.0.1

show ip mroute

clear ip mroute

43.1.3 ip mroute

*

| | |
|--|--|
| <i>rpf-address</i> | |
| <i>interface-type</i> <i>interface-number</i> | |

distance

IPv6

ruijie

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

r . . .

S8606 S8610 S8614 IGMP
SNOOPING SVGL IVGL-SVGL
IGMP SNOOPING SVGL
IVGL-SVGL ip
multicast-routing conflicts with SVGL mode of IGMP SNOOPING!
IGMP SNOOPING IVGL
IGMP SNOOPING IP

Ruijie(config)# ip multicast-rounting

/ . . .

v4

43.1.7 ip multicast boundary

IP IP no

ip multicast boundary *access-list*

no ip multicast boundary *access-list*

| | |
|--------------------|--------------------|
| | |
| <i>access-list</i> | IP access-list ACL |

ACL IP IP ACL ACL

```
ruijie(config-if)# ip access-list mul-boun
ruijie(config-std-nacl)# permit ip 233.3.3.0 0.0.0.255
ruijie(config-std-nacl)# exit
ruijie(config)# interface vlan 1
ruijie(config-if)# ip multicast boundary mul-boun
```

svi1 IP

```
Ruijie(config)# ip access-list mul-boun
Ruijie(config-std-nacl)# permit ip 233.3.3.0 0.0.0.255
Ruijie(config-std-nacl)# exit
Ruijie(config)# interface vlan 1
Ruijie(config-if)# ip multicast boundary mul-boun
```

43.1.8 show ip mroute

show ip mroute [*group-address*] [*source-address*] [**dense**][**sparse**]
[**summary**] [**count**]

| | |
|-----------------------|-------|
| | |
| <i>group-address</i> | |
| <i>source-address</i> | |
| dense | PIMDM |
| sparse | PIMSM |
| summary | |
| count | |

```
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/WRONGVIF/WHOLEPKT rcv from fwd: 1/0/0
Total NOCACHE/WRONGVIF/WHOLEPKT sent to clients: 1/0/0
Immediate/Timed stat updates sent to clients: 0/0
Reg ACK rcv/Reg NACK rcv/Reg pkt sent: 0/0/0
Next stats poll: 00:01:10
Forwarding Counts: Pkt count/Byte count, Other Counts:
Wrong If pkts
Fwd msg counts: WRONGVIF/WHOLEPKT rcv
Client msg counts: WRONGVIF/WHOLEPKT/Imm Stat/Timed
Stat sent
Reg pkt counts: Reg ACK rcv/Reg NACK rcv/Reg pkt sent
(10.10.1.52, 224.0.1.3), Forwarding: 2/19456, Other: 0
Fwd msg: 0/0, Client msg: 0/0/0/0, Reg: 0/0/0

Ruijie# **show ip mroute summary**

IP Multicast Routing Table
Flags: I - Immediate Stat, T - Timed Stat, F - Forwarder
installed
Timers: Uptime/Stat Expiry
Interface State: Interface (TTL)
(10.10.1.52, 224.0.1.3), 00:01:32/00:03:20, PIM-SM,
Flags: T

| Flags | I- T- F- |
|---------------------------|----------------|
| Timers:Uptime/Stat Expiry | |
| Interface State | |
| Owner | |
| Incoming interface | |
| Outgoing interface list | |

| | |
|--|---|
| Forwarding Counts Pkt count/Byte count, | / |
| Other Counts: Wrong If pkts | |

| | |
|-----------------------------|--------|
| | |
| ip multicast-routing | |
| ip pim dense-mode | PIM-DM |
| ip pim sparse-mode | 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
```

```
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

no

```
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 statr

```
Ruijie# debug nsm mcast stats
```

44 MPLS

44.1 advertise-labels for

LDP

advertised-labels for {bgp-routes | host-routes}

no advertised-labels for {bgp-routes | host-routes}

| bgp-routes | bgp |
|--------------------|-----|
| host-routes | 32 |

IGP

BGP

config-mpls-router

advertise-labels for bgp-routes BGP

```
Ruijie(config-mpls-router)#
```

no

[

LDP

```
Ruijie(config)# mpls router ldp
Ruijie(config-mpls-router)#label-retention-mode liberal
```

| | |
|---------------------------------|-----|
| | |
| show mpls ldp parameters | 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
```

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

show mpls label-pool

LDP LSR ID no
[no]

```
Ruijie(config-mpls-router)# loop-detection
```

| show mpls ldp parameters | LDP |
|---------------------------------|-----|
| mpls ldp max-path-vector | LDP |
| mpls ldp max-hop-count | |

44.8 Isp-control-mode

LDP no

isp-control-mode {independent | ordered}

no isp-control-mode

| independent | |
|--------------------|--|
| ordered | |

config-mpls-router

LDP

LDP

```
Ruijie(config)# mpls router ldp
```

```
Ruijie(config-mpls-router)# isp-control-mode ordered
```

| show mpls ldp parameters | LDP |
|---------------------------------|-----|

44.9 mpls ip

MPLS no MPLS
[no] mpls ip

MPLS

MPLS MPLS
MPLS MPLS MPLS
MPLS MPLS

Ruijie(config)# **mpls ip**

| | |
|----------------|------|
| | |
| mpls ip | MPLS |

44.10 mpls ip

MPLS

MPLS MPLS

MPLS LDP

LDP LDP LSP

MPLS

```
Ruijie(config)# interface Gi4/1  
Ruijie(config-if)# mpls ip
```

MPLS

no mpls ip ttl expiration

MPLS TTL

Ruijie(config)# **no mpls ip ttl expiration**

| | |
|----------------|------|
| | |
| mpls ip | MPLS |

44.14 mpls ip ttl propagate

MPLS IP TTL

mpls ip ttl propagate {public | vpn}

no mpls ip ttl propagate

| | |
|---------------|-----|
| | |
| public | TTL |
| vpn | 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

= à U V p 0 ? "

LDP hello no

mpls ldp hello-holdtime <1-65535>
no mpls ldp hello-holdtime

| | |
|-----------|----------------------------------|
| | |
| <1-65535> | hello 65535 |

15

LDP Link Hello

Hello Hello

Hello interval **discovery targeted-hel**

lo

LDP Link hello 30

Ruijie(config)# **interface vlan 10**

Ruijie(config-if)# **mpls ldp hello-holdtime 30**

| | |
|---------------------------------|-------|
| | |
| mpls ldp hello-interval | hello |
| discovery targeted-hello | hello |

44.17 mpls ldp hello-interval

LDP Hello no

mpls ldp hello-interval <1-65535>
no mpls ldp hello-interval

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

| | |
|-----------|-------|
| <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

```

| | |
|---------------------------------|-------|
| | |
| mpls ldp hello-holdtime | hello |
| discovery targeted-hello | hello |

44.18 mpls ldp keepalive-holdtime

```

LDP          keepalive          no

```

```

mpls ldp keepalive-holdtime <15-65535>
no mpls ldp keepalive-holdtime

```

| | |
|------------|-----------|
| | |
| <15-65535> | keepalive |

45

```

                LDP                      LDP
LDP             Keepalive Holdtime      LDP
                targeted-session holdtime

LDP             Keepalive                90
Ruijie(config) # interface vlan 10
Ruijie(config-if)#
```

an 10
ax-ho

LDP

reque

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]
```

| | |
|---------------------------------|-----|
| | |
| show mpls ldp parameters | 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
```

| | |
|----------------|------|
| | |
| mpls ip | MPLS |

44.25 mpls router ldp


```
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 next-hop 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 next-hop interface-name nexthop-ip | FTN PE IP |

```
IP vrf FTN FTN MPLS
IP VRF VRF FTN
0 FTN IP
```

```
Ruijie(config)# mpls static l3vpn-ftn 192.168.0.0/16
out-label 100 remote-pe 10.10.10.1
```

| | |
|-----------------------------------|-----|
| | |
| show mpls forwarding-table | 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 |
| out_label <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
```

| | |
|-----------------------------------|--------|
| | |
| show mpls l2vc ftn_table | vc ftn |
| show mpls forwarding-table | 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*

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
```

| | |
|-----------------------------------|------|
| | |
| show mpls forwarding-table | 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
```

| | |
|--------------------------------|-----|
| | |
| show mpls ldp discovery | LDP |

| | |
|-------------------------------|-----|
| show mpls ldp neighbor | LDP |
|-------------------------------|-----|

44.31 propagate-release

no

[no] propagate-release

config-mpls-router

LDP

LDP

Ruijie(config)# **mpls router ldp**Ruijie(config-mpls-router)# **propagate-release**

| | |
|---------------------------------|-----|
| show mpls ldp parameters | LDP |
|---------------------------------|-----|

44.32 show mpls forwarding-table

MPLS

Show mpls forwarding-table [*A.B.C.D MASK*] [*label label*] [*interface interface-name*] [*next-hop A.B.C.D*] [[*ftn* [*ip* | *vc* | *detail*]] | [[*ilm*] [*ip* | *vc* | *detail*]]] [*detail*] [[*vrf vrf-name*]] [*summary*]

A.B.C.D/mask FEC ILM FTN

label *label* ILM**interface** *interface-name* MPLS (ILM FTN)**next-hop** *A.B.C.D* MPLS ILM FTN

```

ftn
ilm
vc      vc      MPLS
ip      ip      mpls
detail  mpls    ;
vrf     VRF     MPLS  ;
summary MPLS    ;

```

MPLS , FTN ILM

```

Ruijie# Show mpls forwarding-table
Local  Outgoing  Prefix  Outgoing  Next Hop
tag    tag or VC    or Tunnel Id    interface
--IP forward  120.1.1.0/24  GigabitEthernet 3/19
0.0.0.0
--IP forward  167.168.195.0/24  GigabitEthernet 3/19
120.1.1.10
Local tag: ;

```

Outgoing tag or VC ;

PUSH:

POP:

SWAP:

POP IP: , IP

POP L2PORT:
(VPLS)

POP VC:
(VPWS)

IP forward: IP MPLS IP

DROP:


```

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-switching | |

44.34 show mpls ldp bindings

LDP

show mpls ldp bindings

| FEC | FEC | LDP | FEC |
|-----|-----|-----|-----|
| LDP | | | |

```

Ruijie# show mpls ldp bindings
169.254.0.0/16 remote binding: no outlabel lsr:
192.168.0.2:0
192.168.0.1/32 remote binding: label: gen 640 lsr:
192.168.0.2:0 ingress
192.168.0.2/32 remote binding: label: gen impl-null
lsr: 192.168.0.2:0 ingress
192.168.3.0/24 remote binding: label: gen impl-null
lsr: 192.168.0.3:0 ingress

```

```

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

```

| | |
|-------------------------------|-----|
| | |
| show mpls ldp neighbor | 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 |

```

Addresses bound to peer LDP Ident:
      10.20.10.10      192.168.201.220  192.168.198.1
10.5.0.1

```

| | | |
|-------------------------|-----|-----|
| | | |
| Peer LDP Ident | LDP | LDP |
| Local LDP Identifier | LDP | |
| TCP connection | LDP | TCP |
| State | LDP | |
| Msgs sent/recv | LDP | |
| UNSOLICITED ONDEMAND | | |

| | |
|--------------------------------|-----|
| | |
| show mpls ldp discovery | LDP |

44.37 show mpls ldp parameters

LDP

show mpls ldp parameters

```

LDP                                LSR ID transport-address
                                hello
                                keepalibe

```

LDP

```

Ruijie#show mpls ldp parameters
Protocol version: 1
Ldp Router ID: 8.8.8.8
Control Mode: INDEPENDENT
Propogate Release: FALSE
Label Merge: TRUE
Label Retention Mode: LIBERAL
Loop Detection Mode: off

```

```

Targeted Session Keepalive HoldTime/Interval:
180/60 sec
Targeted Hello HoldTime/Interval: 90/10 sec

```

| ldp router-id | ldp router-id |
|---------------------------------|---------------|
| lsp-control-mode | LDP |
| ldp-label-retention-mode | |
| propagate-release | |
| label-merge | |
| loop-detection | |

44.38 show mpls ldp session

LDP

show mpls ldp session

```

IP          TCP          LDP
keepalive
PDU

```

```

Ruijie# show mpls ldp session
Session-5-UP:LDP Identifier 192.168.0.2:0 State
OPERATIONAL
session not backup msg data
session hold msg count:0,write thread(nil),historymax
1
Remote dest 192.168.4.1:646 , Our is ACTIVE
Keepalive rcv timer is on , Hold time is 30 sec
Keepalive send timer is on , Interval is 10 sec
Max PDU is 4096
Path vector limit is 0
Distribution mode is UNSOLICITED
Loop detection mode is NONE
Backoff timer is off

```

```

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

```

| | |
|------------------------|--|
| | |
| label-switching | |

44.40 targeted-session holdtime

keepalive no

targeted-session holdtime <15-65535>

| | |
|----------|--|
| | |
| 15-65535 | |

```

LDP
keepalive 60 LDP 1/3 180
    
```

config-mpls-router

```

LDP
LDP
LDP
LDP 90
    
```

```

Ruijie(config)# mpls router ldp
Router(config-mpls-router)# targeted-session holdtime
90
    
```

| | |
|---------------------------------|-----|
| | |
| show mpls ldp parameters | LDP |

45 BGP/MPLS L3 VPN

45.1 address-family ipv4 vrf

[no] address-family ipv4 vrf *vrf_name*

VRF

VRF

vrf_name VRF

VRF

Router

PE CE

BGP

exit-address-family

Ruijie(config)# router bgp 100

Ruijie(config-router)# address-family ipv4 vrf vrf1

| | |
|---------------------|--|
| | |
| neighbor activate | |
| exit-address-family | |

45.2 address-family vpnv4

[no] address-family vpnv4 [unicast]

vpn

PE

vpn

unicast

vpn

Router

| | | | |
|---------------------|----|----------------------------|----------------|
| | PE | VPN | address- |
| family VPN | | exit-address-family | address |
| s-family VPN | | | |

```
Ruijie(config)# router bgp 100
```

```
Ruijie(config-router)# address-family vpnv4
```

d

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.**

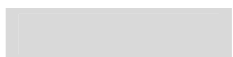
Ruijie(config)# **no ip route static inter-vrf**

45.6 ip route vrf

[no] ip route vrf *vrf_name ip_addr mask interface next-hop-address* **[global]**

VRF

no



```
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
```

| ip vrf forwarding | VRF |
|--------------------------|--------|
| show ip vrf | VRF |
| rd | VRF rd |
| route-target | VRF rt |

45.8 ip vrf forwarding

```
[no] ip vrf forwarding vrf_name
```

```
VRF no
```

```
vrf_name VRF
```

VRF

no

neighbor {*peer-address* | *peer-group-name*} **activate**
no neighbor {*peer-address* | *peer-group-name*} **activate**

| | |
|------------------------|--------------|
| | |
| <i>peer-address</i> | IPv6 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
```

| | |
|---------------------------|-----|
| | |
| router bgp | BGP |
| neighbor remote-as | BGP |

45.11 neighbor allowas-in

PE PE PE AS
no AS

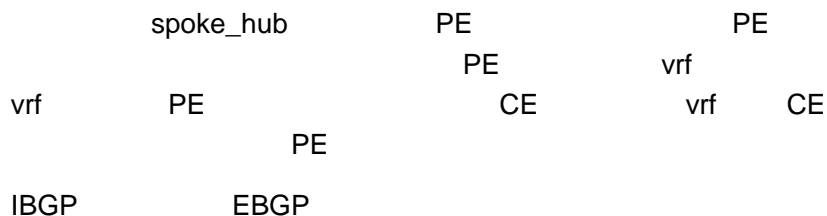
neighbor {*peer-address* | *peer-group-name*} **allows-in** *number*
no neighbor {[*peer-address* | *peer-group-name*] **allows-in**

| | |
|------------------------|-------------------|
| | |
| <i>peer-address</i> | |
| <i>peer-group-name</i> | 32 |
| <i>number</i> | AS 3 [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
```

| | |
|---------------------------|-----|
| | |
| router bgp | BGP |
| neighbor remote-as | BGP |

45.12 neighbor as-override

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

()

no

neighbor {*peer-address* | *peer-group-name*} **description** *text*

no neighbor {*peer-address* | *peer-group-name*} **description**



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> | IPv4 IPv6 |
| <i>peer-group-name</i> | 32 |
| <i>as-number</i> | BGP () <1-65535> |

BGP

BGP

BGP IPv4

BGP IPv6

BGP IPv4 VRF

BGP

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# neighbor 10.0.0.1 remote-as 80
```

| | |
|-------------------|-----|
| | |
| router bgp | BGP |

45.15 neighbor shutdown

BGP () BGP no

neighbor {*peer-address* | *peer-group-name*} **shutdown**
no neighbor {*peer-address* | *peer-group-name*} **shutdown**

| | |
|------------------------|--------------|
| | |
| <i>peer-address</i> | IPv6 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
```

| | |
|----------------------------|-----|
| | |
| router bgp | BGP |
| neighbor remote-as | BGP |
| show ip bgp summary | BGP |

45.16 neighbor soo

no

neighbor [*peer-address* | *peer-group-name*] **soo** *soo-value*

no neighbor [*peer-address* | *peer-group-name*] **soo**



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
```

| | |
|--------------------|-----|
| | |
| ip vrf | VRF |
| show ip vrf | 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 |
| route-map <i>map-tag</i> | route-map route-map |

| | |
|-----------------------------------|--------|
| metric <i>metric-value</i> | metric |
|-----------------------------------|--------|

BGP
 BGP IPv4
 BGP IPv6
 BGP IPv4 VRF

```

                                IP
                                no
no                                redistribute
no
                                route-map
                                metric
                                route-map
                                route-map
                                route-map
                                metric
                                metric
                                metric
    
```

```

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
    
```

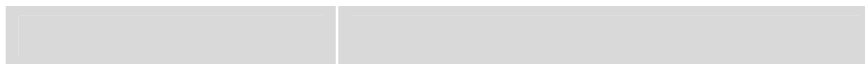
| | |
|--|--|
| | |
|--|--|

show ip prot

G

7

```
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]}]
```



```
no redistribute no
.
r .
OSPF match OSPF
route-map route-map metric
metric route-map route-map route-map
route-map route-map
metric metric
```



```

                VPN                MPLS BGP                bgp vrf
            MP-BGP                MP-BGP                MP-BGP    vpn
            show ip bgp vpnv4 vrf
MP-BGP                show ip bgp vpnv4 all
    
```

```

Ruijie# show ip bgp vpnv4 all
Network                Nexthop                Metric                Localprf
    Path
Route Distinguisher    100 2
*>i 192.168.0.1/32 192.168.0.2    0                100    10 ?
*>i 192.168.1.0/32 192.168.0.2    0                100    ?
Route Distinguisher : 100:30
*>i 192.168.0.1/32 192.168.0.2    0                100    10 ?
*> 192.168.4.0 192.168.4.1    0                20 ?
* 192.168.4.0 0.0.0.0    0                32768    ?
    
```

```

Ruijie# show ip bgp vpnv4 vrf vpn1 summary
BGP router identifier 192.168.0.4 , local AS num 100
BGP VRF vrfl Route Distinguisher 100 30
BGP table version is 1
3 BGP AS PATH entries
0 BGP community entries
Neighbor V AS MsgRcvd Msgsend TblVer IntQ
OutQ Up/Down State/PfxRcd
192.168.4.1 4 20 15 16 1 0 0
00:10:36 3
Total number of neighbors 1
    
```

| | |
|---------|------|
| | |
| * | |
| s | |
| S | |
| > | |
| i | IBGP |
| Nexthop | |

| | |
|----------|---------|
| Metric | |
| Localprf | |
| Path | AS-path |

i

ORIGIN

IGP

```
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
```

| | |
|--------------------------|-----|
| ip vrf forwarding | 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

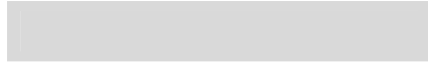
2-100M 1M

100M 8M

show storm-control

GigabitEthernet 1/1
4M

```
Ruijie# configure terminal  
Ruijie(config)# interface GigabitEthernet 1/1  
Ruijie(config-if)# storm-control multicast 4096  
Ruijie(config-if)# end
```



3

show interfaces

```
Ruijie(config)# interface gigabitethernet 1/1  
Ruijie(config-if)# switchport protected
```

| | |
|------------------------|--|
| | |
| show interfaces | |

46.1.3 switchport port-security

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**]

| | |
|---------------------------------------|-------|
| | ' |
| mac-address <i>mac-address</i> | ' |
| ip-address <i>ip-address</i> | ' ID |
| ip-address <i>ipv6-address</i> | ' ID* |
| maximum <i>value</i> | ' |

| | | | | |
|-----|-----|--------|-----|----|
| | | IP | MAC | |
| ACL | | | | |
| | ACL | 802.1x | | IP |

Arp-check

Arp

arp

Ruijie(config-if)# **arp-check**

| | |
|---------------------------|--|
| | |
| show port-security | |

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
```

| | |
|----------------------|---|
| ' | ' |
| storm-control | ' |

46.2.2 show port-security

show port-security [address] [interface *interface-id*]

| | |
|--------------------------------------|--|
| | |
| address | |
| interface <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
```

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

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
```



| | |
|----------------------------|--|
| show dot1x auto-req | |
|----------------------------|--|

47.1.2 dot1x auto-req packet-num

no

dot1x auto-req packet-num *num***no dot1x auto-req packet-num***num*

num = 0;

show dot1x auto-req

802.1x

Ruijie# **configure terminal**Ruijie(config)# **dot1x auto-req packet-num** 0Ruijie(config)# **end**Ruijie# **show dot1x auto-req**

Auto-Req: Enabled

User-Detect : Enabled

Packet-Num : 0

Req-Interval: 30 Second

| | |
|----------------------------|--|
| show dot1x auto-req | |
|----------------------------|--|

47.1.3 dot1x auto-req req-interval

no

dot1x auto-req req-interval *interval***no dot1x auto-req req-interval**

interval s

30

show dot1x auto-req

802.1x 60s

```
Ruijie# configure terminal
Ruijie(config)# dot1x auto-req req-interval 60
Ruijie(config)# end
Ruijie# show dot1x auto-req
Auto-Req: Enabled
User-Detect : Enabled
Packet-Num : 0
Req-Interval: 60 Second
```

show dot1x auto-req

```

Ruijie# configure terminal
Ruijie(config)# dot1x auto-req user-detect
Ruijie(config)# end
Ruijie# show dot1x auto-req
Auto-Req: Enabled
User-Detect : Enabled
Packet-Num : 0
Req-Interval: 60 Second

```

| | |
|----------------------------|--|
| | |
| show dot1x auto-req | |

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

show dot1x

1000s

```

Ruijie# configure terminal
Ruijie(config)# dot1x timeout quiet-period 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:      3600 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

```

| | |
|-------------------|--------|
| | |
| show dot1x | 802.1x |

47.2.2 dot1x timeout re-authperiod

EY 1 Q ,rÀãPà H d0dot1x timeout re

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
```

| | |
|-------------------|--------|
| | |
| show dot1x | 802.1x |

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

Authencee21B (En1c4>TjTD0 Tw[(4r:)P-MD)-T9 1 Tf-P-MDAuthenticatio2.

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
```

| | |
|-------------------|--------|
| | |
| show dot1x | 802.1x |

| | |
|-------------------|--------|
| | |
| show dot1x | 802.1x |

47.3 dot1x

- ' **dot1x re-authentication**
- ' **dot1x reauth-max**

47.3.1 dot1x re-authentication

no

[no] dot1x re-authentication

show dot1x 802.1x

```
Ruijie# configure terminal
Ruijie(config)# dot1x re-authentication
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
```

```

Supplicant Timeout: 10 sec
Server Timeout:    10 sec
Re-authen Max:    3 times
Maximum Request:  3 times
Filter Non-RG Supp: Disabled
Client Oline Probe: Disabled
Eapol Tag Enable: Disabled
Authorization Mode: Group Server

```

| | |
|-------------------|--------|
| | |
| show dot1x | 802.1x |

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

```

| | |
|-------------------|--------|
| | |
| show dot1x | 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

```

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

```

| | |
|-------------------|-------|
| | |
| show dot1x | 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

```


mac-addr

Interface

802.1X show dot1x

auth-address table

```
Ruijie# configure terminal
Ruijie(config)# dot1x auth-address-table address
00d0f8000000 interface ethernet 1/1
Ruijie(config)# end
Ruijie#
```

| | |
|-------------------------------|--------|
| | |
| show dot1x auth-address-table | 802.1X |

47.5.3 dot1x auth-fail max-attemp

VLAN

dot1x auth-fail max-attemp num

no dot1x auth-fail max-attemp

| | |
|-----|------------|
| | |
| num | VLAN , 1-3 |

3

| | | |
|--|-----------------------------|--------|
| | | |
| | show dot1x interface | 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#

| | |
|-------------------|--------|
| | |
| show dot1x | 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
```

| | |
|-------------------|--------|
| | |
| show dot1x | 802.1x |

47.5.7 dot1x dynamic-vlan enable

vlan

no

dot1x dynamic-vlan enable

no dot1x dynamic-vlan enable

show dot1x dynamic-vlan 802.1x

802.1x vlan

```
Ruijie# configure terminal  
Ruijie(config)# interface gigabitEthernet 4/5  
Ruijie(config-if)# dot1x dynamic-vlan enable  
Ruijie(config)# end  
Ruijie#
```

| show dot1x | 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
```



```
no dot1x mac-auth-bypass
```

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

MAC

```
show dot1x port-control interface
```

802.1x MAC

```
Ruijie# configure terminal
Ruijie(config)# interface fa 0/1
Ruijie(config-if)# dot1x mac-auth-bypass
Ruijie(config-if)# end
Ruijie#write
```

| | |
|--|--------|
| | |
| show dot1x port-control interface | 802.1x |

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

47.5.11 dot1x mac-auth-bypass timeout-activity

802.1x MAC

```
dot1x mac-auth-bypass timeout-activity value
```

```
no dot1x mac-auth-bypass timeout-activity
```

| | |
|--------------|-----------|
| | |
| <i>value</i> | , 1-65535 |

```
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
```

```
show dot1x port-control interface
```

```
802.1x
```

```
-
```

```
-- 17.3653 -1.7126 TD(1.7 Tw[(sh
```

```
Ruijie(config-if)# dot1x mac-auth-bypass violation
Ruijie(config-if)# end
Ruijie#write
```

| | |
|--|--------|
| | |
| show dot1x port-control interface | 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#
```


802.1x

show dot1x

802.1x

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#

```

| | |
|--------------------------------|--------|
| | |
| show dot1x port-control | 802.1x |
| Show running-config | |

47.5.17 dot1x stationarity enable

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
```

| | |
|-------------------|-----|
| | |
| <i>url-string</i> | URL |

|

|

|

```

1                ruijie.net/web
Ruijie(config)# dot1x redirect url http://ruijie.net/web
    
```

| | |
|---|-----------|
| | |
| dot1x redirect for special tcp-destination port | web ip ip |
| dot1x redirect time-out | |
| dot1x redirect num for special source-ip | |
| show dot1x | dot1x |

|

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

47.5.19 dot1x redirect for special tcp-destination port

```

8080                ip        ip  web                80
tcp-destination port 16  TCP        no dot1x redirect for special
                                port_num
    
```

[no] dot1x redirect for special tcp-destination port *port num*] p

| | |
|-----------------|--------|
| | |
| <i>port num</i> | TCP ip |

1 TCP 8443

Ruijie(config)#dot1x redirect for special tcp-destination port
8443

| dot1x redirect url | |
|--------------------------------|--|
| dot1x redirect time-out | |

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

┌
└

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

47.5.21 dot1x redirect num for special source-ip

1

1-10

no

dot1x redirect num for special source-ip num

no dot1x redirect num for special source-ip

| | |
|------------|--|
| | |
| <i>num</i> | |

┌
└

1

┌
└

┌
└

1

3

Ruijie(config)# dot1x redirect num for special source-ip 3

| | | | |
|--|-----|----|----|
| | | | |
| dot1x redirect url | | | |
| dot1x redirect for special tcp-destination port | web | ip | ip |

| | | |
|--|--------------------------------|-------|
| | dot1x redirect time-out | |
| | show dot1x | dot1x |
| | | |
| | | |
| | - | - |

47.6 dot1x

- ' **show dot1x**
- ' **show dot1x auth-address-table**
- ' **show dot1x auto-req**
- ' **show dot1x private-supPLICANT-only**
- ' **show dot1x max-req**
- ' **show dot1x port-control**
- ' **show dot1x probe-timer**
- ' **show dot1x re-authentication**
- ' **show dot1x reauth-max**
- ' **show dot1x summary**
- ' **show dot1x timeout**
- ' **show dot1x user id**

47.6.1 show dot1x

802.1x

show dot1x

```
Ruijie# show dot1x  
802.1X Status:      Enabled  
Authentication Mode: EAP-MD5
```

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#
```

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

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

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#
```

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

802.1X

| | |
|-------------------------------------|--|
| dot1x reauth-max | |
| dot1x re-authentication | |
| dot1x timeout quiet-period | |
| dot1x timeout re-authperiod | |
| dot1x timeout server-timeout | |
| dot1x timeout supp-timeout | |
| dot1x timeout tx-period | |

47.6.5 show dot1x max-req

show dot1x max-req

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

| | |
|------------------------|--------|
| | |
| dot1x auth-mode | 802.1x |
| dot1x max-req | |

| | |
|-------------------------------------|--|
| dot1x port-control auto | |
| dot1x reauth-max | |
| dot1x re-authentication | |
| dot1x timeout quiet-period | |
| dot1x timeout re-authperiod | |
| dot1x timeout server-timeout | |
| dot1x timeout supp-timeout | |
| dot1x timeout tx-period | |

47.6.6 show dot1x port-control

show dot1x port-control [interface *interface*]

interface

```
Ruijie# show dot1x port-control
interface dyn-user static-user max-user qos
ctrl-mode status
-----
Gi0/1      0          1          6000      dscp: 0
mac-base Authed
Ruijie#
```

| | | |
|---|--------------------------------------|------------|
| ' | | ' |
| ' | Xch% U h\! acXY | ' , \$&" % |
| ' | Xch% aU ! fYe | ' |
| ' | Xch% dcfh! Wtbhfc` U hc | ' |
| ' | Xch% fYU h\! aU | ' |
| ' | Xch% fY! U h\Ybh] W]h] cb | ' |
| ' | Xch% h] aYci h ei] Yh! dYf] cX | ' |
| ' | Xch% h] aYci h fY! U h\dYf] cX | ' |
| ' | Xch% h] aYci h gYfj Yf! h] aYci h | ' A |

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

47.6.8 show dot1x re-authentication

show dot1x re-authentication

```
Ruijie# show dot1x re-authentication
reauth-enabled: disabled
Ruijie#
```

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

| | |
|-------------------------------------|--|
| dot1x reauth-max | |
| dot1x re-authentication | |
| dot1x timeout quiet-period | |
| dot1x timeout re-authperiod | |
| dot1x timeout server-timeout | |
| dot1x timeout supp-timeout | |
| dot1x timeout tx-period | |

47.6.9 show dot1x reauth-max

show dot1x reauth-max

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

| | |
|----------------|----------|
| | |
| Xch% U h! acXY | , \$&" % |

| | |
|-------------------------------|-----------|
| ' Xch% aU ! fYe | ' |
| ' Xch% dcfh! Vtbf c` U hc | ' |
| ' Xch% fYU h\! aU | ' |
| ' Xch% fY! U h\Ybh] W[h] cb | ' |
| ' Xch% ei]Yh! dYf] cX | h] aYci h |
| ' Xch% fY! U h\dYf] cX | h] aYci h |
| ' Xch% gYfj Yf! h] aYci h | h] aYci h |
| ' Xch% gi dd! h] aYci h | h] aYci h |
| ' Xch% h] aYci h hl ! dYf] cX | ' |

47.6.10 show dot1x summary

802.1X

show dot1x summary

```
Ruijie# show dot1x summary
ID      MAC          Interface VLAN Auth-State
Backend-State Port-Status Type
-----
1 00d0f8000000 Gi0/1      1  Authenticated Idle
```

```

Authed      Static
Ruijie#

```

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

47.6.11 show dot1x user id

802.1X

```
show dot1x user id <id>
```

```
id      show summary      id
```

```
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 seesion time is 1000000 seconds
Authorization ip address is 192.168.217.64
Start accounting
Permit proxy user
Permit dial user
IP privilige is 2
```



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
```

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

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      aaa
authentication dot1x 802.1X no
      802.1X

```

```
aaa authentication dot1x {default | list-name} method1 [method2...]
```

```
no aaa authentication dot1x {default | list-name}
```

```
default      802.1X
```

```
list-name    802.1X
```

```
method      4
```

| | |
|--------------|--------|
| | |
| local | |
| none | |
| group | RADIUS |

```

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

```

AAA Enable AAA Enable
aaa authentication enable
 Enable

Enable Enable

AAA Enable RADIUS RADIUS

Ruijie(config)# **aaa authentication enable default group radius local**

| | |
|----------------------|-----|
| | |
| aaa new-model | AAA |
| enable | |
| username | |

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

| | |
|--------------|----------------|
| | |
| local | |
| none | |
| group | 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

```

| | |
|-----------------------------|-------|
| | |
| aaa new-model | AAA |
| username | |
| login authentication | Login |

48.1.4 aaa authentication ppp

```

AAA PPP

```

aaa authentication ppp {default | list-name} method1 [method2...]

no aaa authentication ppp {default | list-name}

default

PPP

list-name

PPP

method

4

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
                                list-1 AAA Login
                                VTY 0 - 4
Ruijie(config)# aaa authentication login list-1 local
Ruijie(config)# line vty 0 4 liig)#
```

- ' **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
aaa authorization commands no
AAA
aaa authorization commands *level* {**default** | *list-name*} *method1*
[*method2...*]
no aaa authorization commands *level* {**default** | *list-name*}

level 0~15

default

list-name

method 4

| none | |
|--------------|---------|
| group | TACACS+ |

AAA

AAA

AAA

14

14

no

Ruijie(config)# **aaa authorization config-commands**

| aaa new-model | AAA |
|-----------------------------------|-----|
| aaa authorization commands | 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
RADIUS RADIUS RADIUS
RADIUS

RADIUS

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

| aaa new-model | AAA |
|---------------------------|-----|
| aaa accounting | AAA |
| aaa authentication | AAA |
| username | |

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
```

| aaa new-model | AAA |
|-----------------------------------|-----|
| aaa authorization commands | 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
```

| | |
|-----------------------------------|----------|
| | |
| aaa new-model | AAA |
| aaa authorization commands | AAA Exec |

level

0~15

default*list-name**method*

4

| | |
|--------------|---------|
| | |
| none | |
| group | TACACS+ |

NAS

aaa accounting exec no Exec

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

no aaa accounting exec {*default* | *list-name*}

default Exec

list-name Exec

method 4

| none | |
|--------------|----------------|
| group | TACACS+ RADIUS |

Exec

none Exec

NAS CLI

Start

Stop

Stop

Start

Exec

RADIUS

NAS

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

| aaa new-model | AAA |
|----------------------------|------|
| aaa authentication | AAA |
| accounting commands | 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
```

| aaa new-model | AAA |
|----------------------------------|-----|
| aaa authorization network | AAA |
| aaa authentication | AAA |
| username | |

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)#
```

| aaa new-model | AAA |
|-------------------------------|-----|
| aaa accounting network | |

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 | list-name}
```

```
no accounting commands level
```

level 0~15

default

list-name

```

TACACS+          cmd          15          none
VTY 0 - 4

Ruijie(config)# aaa accounting commands 15 cmd group
tacacs+ none
Ruijie(config)# line vty 0 4
Ruijie(config-line)# accounting commands 15 cmd

```

| | |
|--------------------------------|-----|
| | |
| aaa new-model | AAA |
| aaa accounting commands | AAA |

48.3.7 accounting exec

```

Exec
accounting exec          no          Exec
accounting exec {default | list-name}
no accounting exec

default          Exec

```

list-name

Exec

Exec

Exec

Exec

Exec

exec-1 Exec

RADIUS

none

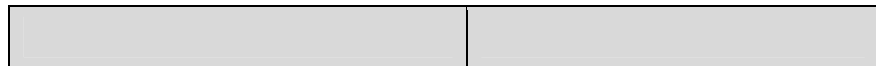
VTY

0-4

```
Ruijie(config)# aaa accounting exec exec-1 group radius none
```

```
Ruijie(config)# line vty 0 4
```

```
Ruijie(config-line)# accounting exec exec-1
```



vrf

```
Ruijie(config)# aaa group server radius ss  
Ruijie(config-gs-radius)# server 192.168.4.12  
Ruijie(config-gs-radius)# server 192.168.4.13  
Ruijie(config-gs-radius)# ip vrf forwarding vrf-name  
Ruijie(config-gs-radius)# end
```

| | |
|-------------------------|-----|
| | |
| aaa group server | aaa |
| show aaa group | aaa |

48.4.3 server

AAA no

server ip-address [auth-port port1] [acct-port port2]

no server [(acct)ort]

```
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
```

| aaa group server | aaa |
|-------------------------|-----|
| show aaa group | aaa |

Referred: 2
Server List:
IP Address: 192.168.217.64
Authentication Port: 1812
Accounting Port: 1813
Referred: 1

| | |
|-------------------------|-----|
| | |
| aaa group server | 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 local authentication attempts *max-attempts*

max-attempts

1~2147483647

3

Login

Ruijie#

AAA

AAA AAA **no** AAA **aaa new-model**

Ruijie#

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
```

| aaa authentication | |
|---------------------------|--|
| aaa authorization | |
| aaa accounting | |

48.5.7 show aaa user logout

```
show aaa user logout {all | user-name <word>}
```

```
<word>      ID
```

```
Ruijie# show aaa user logout all
```

| | |
|----------------------------|-------|
| | |
| show running-config | |
| show aaa lockout | login |

49 RADIUS

49.1 RADIUS

RADIUS

```
' ip radius radius 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          radius          fastEthernet 0/0          ip
radius
Ruijie(config)# ip radius source-interface
fastEthernet 0/0
    
```

| | |
|---------------------------|--------|
| | |
| radius-server host | RADIUS |
| ip address | 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          IETF
    
```

```

RADIUS Calling-Station-ID          IETF          +à
    
```

RADIUS

RADIUS

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**

| | |
|------------------------------|--------|
| | |
| radius-server host | RADIUS |
| radius-server key | RADIUS |
| radius-server timeout | 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

```
Ruijie(config)# radius-server deadtime 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 privilege | 22 |
| 23 | login privilege | 42 |

| 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 privilege | 22 |
| 23 | login privilege | 42 |
| 24 | limit to user number | 50 |

max up-rate 211

Ruijie(config)# radius attribute 16 vendor-type 211

| | |
|--------------------|----------------|
| | |
| radius set qos cos | radius qos cos |

49.1.9 radius set qos cos

radius qos cos

radius set qos cos

no radius set qos cos

qos dscp

RADIUS

qos

cos

dscp

Ruijie(config)# **radius set**

49.2 RADIUS

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

RADIUS

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

0 Tc38

50 TACACS+

50.1 TACACS+

TACACS+

```
' aaa group server tacacs+
```

```
' server(TACACS+)
```

```
'
```

| | | |
|--------------------------|---------|--------|
| | | |
| server | TACACS+ | server |
| ip vrf forwarding | TACACS+ | VRF |

50.1.2 server(TACACS+)

TACACS+

server *ip-address*

no server *ip-address*

ip-address TACACS+

TACACS+

aaa group server tacacs+ TACACS+

TACACS+

tacacs-server host

TACACS+

tac1 TACACS+

1.1.1.1 TACACS+

Ruijie(config)# **aaa group server tacacs+ tac1**

Ruijie(config-gs-tacacs)# **server 1.1.1.1**

| | | |
|---------------------------------|---------|-----|
| | | |
| aaa group server tacacs+ | TACACS+ | |
| ip vrf forwarding | TACACS+ | VRF |

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

```

| | |
|---------------------------------|-------------------|
| | |
| aaa group server tacacs+ | TACACS+ |
| server | TACACS+ server |

50.1.4 ip tacacs source-interface

```

TACACS+

ip tacacs source-interface interface
no ip tacacs source-interface

Interface TACACS+

```

TACACS+

```

TACACS+          nas
TACACS+          ip
TACACS+

```

```

TACACS+          fastEthernet 0/0      ip
TACACS+

```

```

Ruijie(config)# ip tacacs source-interface
fastEthernet 0/0

```

| | |
|---------------------------|---------|
| | |
| tacacs-server host | TACACS+ |
| ip address | ip |

50.1.5 tacacs-server host

```

TACACS+          IP

```

```

tacacs-server host ip-address [port integer] [timeout integer] [key [0 | 7]string]

```

```

no tacacs-server host ip-address

```

```

ip-address      TACACS+          IP
port integer    TACACS+          TCP
timeout integer TACACS+
key string      TACACS+ client
0 | 7           0          7

```

TACACS+

TACACS+ AAA
tacacs-server

TACACS+
TACACS+

TACACS+

Ruijie(config)# **tacacs-server host 192.168.12.1**

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

50.1.6 tacacs-server key

TACACS+

tacacs-server key [0 | 7] string

no tacacs-server key

string

0 | 7

0

7

TACACS+

TACACS+

TACACS+

host
key

key
key

TACACS+

aaa

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

| | |
|------------------------------|---------|
| | |
| tacacs-server host | TACACS+ |
| tacacs-server timeout | TACACS+ |

50.1.7 tacacs-server timeout

TACACS+

tacacs-server timeout *seconds*

no tacacs-server timeout

seconds

1-1000

5

host
timeout

timeout

timeout

10

Ruijie(config)# **tacacs-server timeout** 10

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

50.2.1 debug tacacs+

```
TACACS+          no          TACACS+
debug tacacs+
no debug tacacs+
```

EXEC

50.2.2 show tacacs

```
TACACS+
show tacacs
```

TACACS+

```
Ruijie# show tacacs
Tacacs+ Server : 172.19.192.80/49
Socket Opens: 0
Socket Closes: 0
Total Packets Sent: 0
Total Packets Recv: 0
Reference Count: 0
```

| | |
|---------------------------|---------|
| | |
| tacacs-server host | TACACS+ |

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}

| | |
|------------|-----|
| | |
| rsa | RSA |
| dsa | DSA |

SSH Server

```

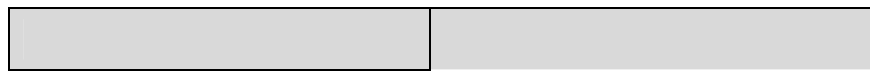
SSH Server
enable service ssh-server
SSH 1  RSA  SSH 2  RSA
      RSA  SSH1  SSH2
DSA    SSH2
SSH
SSH Server
DSA

```

r . . .

key zeroize **no crypto key generate** **crypto**

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



show ip ssh

SSH Server

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

| | |
|--------------------------------------|------------|
| | |
| show ip ssh | SSH Server |
| crypto key generate {rsa dsa} | DSA RSA |

RGOS10.1

51.1.3 ip ssh version

SSH server no

```
ip ssh version {1 / 2}
no ip ssh version
```

| | | |
|----------|------------|------|
| | | |
| 1 | SSH Server | SSH1 |
| 2 | SSH Server | SSH2 |

```
SSH SSH 1 2
no ip ssh version
```

```
SSH Server SSH
SSH Server SSH1 SSH2 SSH 1
SSH 2 1 2
SSH show ip ssh SSH Serv
er
```

2

```
Ruijie# configure terminal  
Ruijie(config)# ip ssh version 2
```

| | |
|--------------------|------------|
| | |
| show ip ssh | SSH Server |

RGOS10.1

51.1.4 ip ssh time-out

SSH Server

no

```
ip ssh time-out time-out 510
```


51.2 SSH

SSH

- ' **show ip ssh**
- ' **show ssh**
- ' **show crypto key mypubkey**
- ' **disconnect ssh**

51.2.1 show ip ssh

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}

| rsa | RSA |
|-----|-----|
| dsa | DSA |

SSH Server

```
Ruijie# show crypto key mypubkey rsa
```

| <code>crypto key generate {rsa dsa}</code> | DSA RSA |
|--|---------|

RGOS10.1

51.2.4 disconnect ssh

SSH

```
disconnect ssh [vty] session-id
```

| <i>session-id</i> | SSH |
|-------------------|-----|

VTY SSH

SSH SSH

SSH

```
Ruijie# disconnect ssh 1
```

```
Ruijie# disconnect ssh vty 1
```

| show ssh | SSH |
|--|-----|
| Clear line vty <i>line_number</i> | VTY |

RGOS10.1

52 CPU

52.1

- ' **cpu-protect type** *packet-tpye* **pps** *pps_value*
- ' **cpu-protect type** *packet-tpye* **pri** *pri_value*

52.1.1 **cpu-protect type packet-type pps pps_value**

```

pri_num  ID          0 7
          0

```

```

BPDU          7

```

```

Ruijie(config)# cpu-protect type bpdu pri 7
Set packet type bpdu pri 7.

```

| cpu-protect type packet-type | |
|-------------------------------------|--|
| pps pps_value | |

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
...

```

| show cpu-protect slot <i>slot-num</i> | 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 |
| tvl1 | 20 | 3 | 0 |

| | |
|--------------------------------|-----|
| | |
| show cpu-protect mboard | CPU |

52.2.3 show cpu-protect type

show cpu-protect type { arp | bpdu | dhcp | ipv6mc | igmp | rip | ospf | vrrp | pim | tvl1 | 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
```

| | |
|--|-----|
| | |
| show cpu-protect type <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
```

| | |
|-------------------|--|
| | |
| Show system-guard | |

53.1.2 system-guard isolate-time seconds

no

system-guard isolate-time *seconds*

no system-guard isolate-time

| | | | |
|----------------|------------|----------------------|----|
| | | | |
| <i>seconds</i> | IP 3600 | <i>second</i> 120 | 30 |

120

IP second

IP

100

Ruijie(config-if)# **system-guard isolate-time 100**

| | |
|---------------------|--|
| | |
| system-guard enable | |

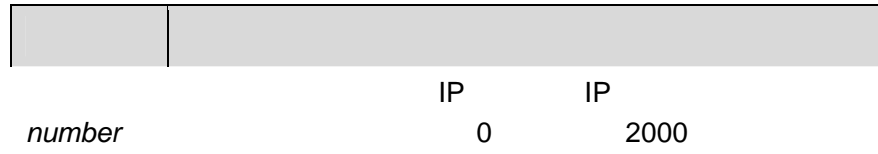
53.1.3 system-guard same-dest-ip-attack-packets number

IP

no

system-guard same-dest-ip-attack-packets *number*

no system-guard same-dest-ip-attack-packets



| | | | |
|---------------|----|------|----|
| <i>number</i> | IP | | |
| | 0 | 1000 | 10 |
| | 0 | | |

10

100

```
Ruijie(config-if)# system-guard
scan-dest-ip-attack-packets 100
```

| | |
|----------------------------|--|
| | |
| system-guard enable | |

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

```
Ruijie(config)# system-guard exception-ip
192.168.5.145/24
```

| | |
|----------------------------|--|
| | |
| system-guard enable | |

53.1.7 clear system-guard [interface interface-id [ip-address]]

IP

```
clear system-guard [interface interface-id [ip-address] ]
```

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

Fastethernet 0/1

IP

```
Ruijie# clear system-guard interface fastethernet 0/1
```

| | |
|----------------------------|--|
| | |
| system-guard enable | |

53.2

- ' **show system-guard [interface interface-id]**
- ' **show system-guard isolate-ip [interface interface-id]**
- ' **show system-guard detect-ip [interface interface-id]**
- ' **show system-guard exception-ip**

53.2.1 show system-guard [interface interface-id]

show system-guard [interface *interface-id*]

| | |
|--------------------------------------|--|
| | |
| interface <i>interface-id</i> | |

```
Ruijie# show system-guard
detect-maxnum number : 100 //
isolated host number : 11 //
interface state isolate time same-attack-pkts
scan-attack-pkts
-----
Fa 0/1 ENABLE 120 20 10
Fa 0/2 DISABLE 110 21 11
.....
Ruijie# show system-guard interface Fa 0/1
detect-maxnum number : 100 //
isolated host number : 11 //
interface state isolate time same-attack-pkts
scan-attack-pkts
-----
Fa 0/1 ENABLE 120 20 10
```

| | |
|----------------------------|--|
| | |
| system-guard enable | |

53.2.2 show system-guard isolate-ip [interface interface-id]

IP

show system-guard isolate-ip [interface *interface-id*]

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

| | |
|--------------------------------------|--|
| interface <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
```

| | |
|----------------------------|--|
| | |
| system-guard enable | |

53.2.3 show system-guard detect-ip [interface interface-id]

IP

show system-guard detect-ip [interface *interface-id*]

| | |
|--------------------------------------|--|
| | |
| interface <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
```

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

| | |
|----------------------------|--|
| system-guard enable | |
|----------------------------|--|

53.2.4 show system-guard exception-ip [interface interface-id]

IP

show system-guard exception-ip [interface *interface-id*]

| | |
|--------------------------------------|--|
| | |
| interface <i>interface-id</i> | |

```
Ruijie# show system-guard exception-ip
Exception IP Address      Exception Mask
-----
255.255.255.0
192.168.4.11             255.255.255.0
```

| | |
|----------------------------|--|
| | |
| system-guard enable | |

54 DAI

54.1 VLAN DAI

```
ip arp inspection vlan
```

54.1.1 ip arp inspection vlan vlan-id

```

no          vlan-id          VLAN DAI
           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
```

| | |
|------------------------------------|----------|
| | |
| show ip arp inspection vlan | VLAN DAI |

54.2

55 IP Source Guard

55.1 IP Source Guard

IP Source Guard

ip source binding

55.1.1 ip source binding

no

[no] ip source binding *mac-address* **vlan** *vlan-id* *ip-address* **interface**
interface-id

mac-address

MAC

vlan-id

vlan id

vlan id

wa 30c309b7<007a>Tj/TT2 1 Tj4459 -1.9961b4441c8>5.7<1be2>.942/TT5 1 Tf0 Tr6.0229 0 TD0 350e2cd51699.0035 789.977

| | |
|-------------------------------|----|
| | |
| show ip source binding | 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# configure terminal
Ruijie(config)# interface fastEthernet 0/1
Ruijie(config-if)# ip verify source
Ruijie(config-if)# end
Ruijie# show ip verify source
Interface Filter-type Filter-mode Ip-address
Mac-address VLAN
-----

```


| Interface | Filter-type | Filter-mode |
|------------------|-------------|---------------|
| Ip-address | Mac-address | VLAN |
| ----- | | |
| FastEthernet 0/1 | ip | active |
| 00d0.f801.0101 | 1 | 192.168.4.243 |

| | |
|-------------------------|------------------------|
| | |
| ip verify source | IP Source Guard |

| | |
|--------------------------|--|
| | |
| ip source binding | |

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
```



```
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
```



User<IP=N/A,MAC=0000.0000.0004,port=Gi4/1,VLAN=1> is isolated.

15

```

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

*Dec 27 15:34:16: %ARPGUARD-4-SCAN: ARP scan was detected.

```

show arp-guard scan  ARP
256          ARP
  
```

*Dec 27 15:34:16: %ARPGUARD-4-SCAN_TABLE_FULL: ARP scan table is full.

TRAP

ARP scan from user< MAC=0000.0000.0004,port=Gi4/1,VLAN=1> detected.

```

ARP          256          ARP
  
```

Ruijie(config)# **arp-guard scan-threshold 20**

| | |
|-------------------------------------|-----|
| | |
| show arp-guard configuration | |
| clear arp-guard scan | ARP |
| show arp-guard scan | ARP |

56.1.7 clear arp-guard users

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**

| | |
|-----------------------------------|--|
| | |
| arp-guard attack-threshold | |

show arp-guard users

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

mac-address MAC

```
Ruijie# show arp-guard users statistics
```

```
Success: 100
```

```
Fail: 1
```

```
-----  
Total: 101
```

```
101
```

```
100
```

```
1
```

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

```
Ruijie# show arp-guard users
```

If column 1 shows '*', it means "hardware failed to isolate user".

```
VLAN      interface      Ip address      MAC address  
remain-time(seconds)
```

```
1         Gi0/1          1.1.1.1         -          110
```

```
2         Gi0/1          1.1.2.1         -          61
```

```
*3        Gi0/1          -              0000.0000.1111  110
```

```
4         Gi0/1          -              0000.0000.2222  61
```

```
Total 4 users
```

| | |
|-----------------------------------|--|
| | |
| arp-guard attack-threshold | |
| clear arp-guard users | |

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 MAC

ARP

Ruijie# **show arp-guard scan statistics**

ARP scan table has 4 record(s).

“ARP 4 ”

Ruijie# **show arp-guard scan**

```
VLAN   interface      MAC address      timestamp
1      Gi0/1          0000.0000.0001  2008-01-23 16:23:10
2      Gi0/2          0000.0000.0002  2008-01-23 16:24:10
3      Gi0/3          0000.0000.0003  2008-01-23 16:25:10
4      Gi0/4          0000.0000.0004  2008-01-23 16:26:10
Total  4 record(s)
```

```
“timestamp”                    ARP                    “2008-01-23 16:23:10”
   2008   1   23   16   23   10                    ARP
```

Ruijie# **show arp-guard scan vlan 1 interface g 0/1**
0000.0000.0001

```
VLAN   interface      MAC address      timestamp
1      Gi0/1          0000.0000.0001  2008-01-23 16:23:10
Total  1 record(s)
```

[REDACTED] 7Ebb6Af.0/AsA(4RsT*Cb)0

57 ACL

| id | IP ACL: 1-9 IP ACL: 100 MAC ACL: 70 ACL: 270 |
|------|---|
| name | ACL |
| sn | ACL () |

| | |
|------------------------|---|
| 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- gt- neq- range- port |
| src-mac-addr | |
| dst-mac-addr | |
| VID vid | vlan id |
| VID inner vid | tag vid |
| ethernet-type | 0x |

| | | | | | |
|---|------------|----|----|-----|----|
| C | | 12 | Q | IP | 36 |
| D | VLAN tag | 14 | R | ip | 38 |
| E | DSAP() | 18 | S | ip | 42 |
| F | SSAP() | 19 | T | TCP | 46 |
| G | Ctrl | 20 | U | TCP | 48 |
| H | Org Code | 21 | V | | 50 |
| I | | 24 | W | | 54 |
| J | IP | 26 | XY | IP | 58 |

58(9)TjET174.96 534008 326.52 0.4

- ' **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** | **permit**} {*source source-wildcard* | **host** *source* | **any**}

- 2) IP 100 - 199 2000 - 2699

access-list *id* {**deny** | **permit**} **protocol** {*source source-wildcard* | **host** *source* | **any**} {*destination destination-wildcard* | **host** *destination* | **any**} [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**time-range** *time-range-name*]

- 3) MAC 700 - 799

access-list *id* {**deny** | **permit**} {**any** | **host** *source-mac-address*} {**any** | **host** *destination-mac-address*} [*ethernet-type*][**cos** [*out*][**inner** *in*]]

- 4) Expert 2700 - 2899

access-list *id* {**deny** | **permit**} [**protocol** | [*ethernet-type*][**cos** [*out*][**inner** *in*]]] [**VID** [*out*][**inner** *in*]] {*source source-wildcard* | **host** *source* | **any**} {**host** *source-mac-address* | **any**} {*destination destination-wildcard* | **host** *destination* | **any**} {**host** *destination-mac-address* | **any**} [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**time-range** *time-range-name*]

Ethernet-type cos

access-list *id* {**deny** | **permit**} {*ethernet-type*| **cos** [*out*][**inner** *in*]} [**VID** [*out*][**inner** *in*]] {*source source-wildcard* | **host** *source* | **any**} {**host** *source-mac-address* | **any**} {*destination destination-wildcard* | **host** *destination* | **any**} {**host** *destination-mac-address* | **any**} [**time-range** *time-range-name*]

Protocol

access-list *id* {**deny** | **permit**} **protocol** [**VID** [*out*][**inner** *in*]] {*source source-wildcard* | **host** *source* | **any**} {**host** *source-mac-address* | **any**} {*destination destination-wildcard* | **host** *destination* | **any**} {**host**

destination-mac-address | **any** } [**precedence** *precedence*] [**tos** *tos*]
[fragments] [**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*]

' **urg**
' **ack**
' **psh**
' **rst**
' **syn**
' **fin**

' **critical**
' **flash**
' **flash-override**
'

- ' **information-request**
- ' **mask-reply**
- ' **mask-request**
- ' **mobile-redirect**
- ' **net-redirect**
- ' **net-tos-redirect**
- ' **net-tos-unreachable**
- ' **net-unreachable**
- ' **network-unknown**
- ' **no-room-for-option**
- ' **option-missing**
- ' **packet-too-big**
- ' **parameter-problem**
- ' **port-unreachable**
- ' **precedence-unreachable**
- ' **protocol-unreachable**
- ' **redirect**
- ' **router-advertisement**
- ' **router-solicitation**
- ' **source-quench**
- ' **source-route-failed**
- ' **time-exceeded**
- ' **timestamp-reply**
- ' **timestamp-request**
- ' **ttl-exceeded**
- ' **unreachable**

TCP

TCP

- ' **bgp**
- ' **chargen**
- ' **cmd**
- ' **daytime**
- ' **discard**
- ' **domain**
- ' **echo**
- ' **exec**
- ' **finger**
- ' **ftp**

```
' ftp-data
' gopher
' hostname
' ident
' irc
' klogin
' kshell
' login
' nntp
' pim-auto-rp
' pop2
' pop3
' smtp
' sunrpc
' syslog
' tacacs
' talk
' telnet
' time
' uucp
' whois
' www
      UDP      UDP
' biff
' bootpc
' bootps
' discard
' dnsix
' domain
' echo
' isakmp
' mobile-ip
' nameserver
' netbios-dgm
' netbios-ns
' netbios-ss
' ntp
```

```
' pim-auto-rp
' rip
' snmp
' snmptrap
' sunrpc
' syslog
' tacacs
' talk
' tftp
' time
' who
' xdmcp
```

Ethernet-type

```
' aarp
' appletalk
' decnet-iv
' diagnostic
' etype-6000
' etype-8042
' lat
' lavc-sca
' mop-console
' mop-dump
' mumps
' netbios
' vines-echo
' xns-idp
```

1) IP

```
IP 192.168.1.64 - 192.168.1.127
```

```
Ruijie(config)# access-list 1 permit 192.168.1.64
0.0.0.63
```

2) IP

```
IP DNS ICMP
```


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)#
```

| | |
|-----------------------------|----|
| | |
| show ip access-lists | IP |

RGOS10.0

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)#
```

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

RGOS10.0

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)#
```

| | |
|---------------------------------|--|
| | |
| show expert access-lists | |

RGOS10.0

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)#
```

| | |
|--------------------------|------|
| | |
| show access-lists | IPV6 |

RGOS10.0

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

inc-sn

start-sn 10

inc-sn 10

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#
```

| | |
|--------------------------|--|
| | |
| show access-lists | |

RGOS10.0

57.1.7 deny

(deny)

ACL

ACL

1) IP

[sn] **deny** {*source source-wildcard* | **host** *source* | **any**}

2) IP

[sn] **deny protocol** *source source-wildcard destination destination-wildcard* [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**time-range** *time-range-name*]

IP

Internet Control Message Protocol (ICMP)

[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]

3) MAC

[sn] deny {any | host source-mac-address}{any | host destination-mac-address} [ethernet-type][cos [out] [inner in]]

4) Expert

[sn] deny[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] deny {[ethernet-type][cos [out] [inner in]]} [[VID [out][inner in]]] {source source-wildcard | host source | any} {host source-mac-address | any } {destination destination-wildcard | host destination | any} {host destination-mac-address | any} [time-range time-range-name]

protocol

[sn] deny protocol [[VID [out][inner in]]] {source source-wildcard | host source | any} {host source-mac-address | any } {destination destination-wildcard | host destination | any} {host destination-mac-address | any} [precedence precedence] [tos tos] [fragments] [time-range time-range-name]

expert

Internet Control Message Protocol (ICMP)

```
[sn] deny icmp [[VID [out[[inner in]]] {source source-wildcard | host  
source | any} {host source-mac-address | any} {destination  
destination-wildcard | host destination | any} {host  
destination-mac-address | any} [icmp-type] [[icmp-type [icmp-code ]] |  
[icmp-message]] [precedence precedence] [tos tos] [
```

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>

```
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)# ip access-list standard 34
Ruijie(config-ext-nacl)# deny host 192.168.4.12
Ruijie(config-ext-nacl)# show access-lists
ip access-list standard 34
10 deny host 192.168.4.12
Ruijie(config-ext-nacl)# exit
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# ip access-group 34 in
```

```
IPV6    ACL     IP      192.168.4.12
        1
```

```
Ruijie(config)# ipv6 access-list extended v6-acl
Ruijie(config-ipv6-nacl)# 11 deny ipv6 host
192.168.4.12 any
Ruijie(config-ipv6-nacl)# show access-lists
ipv6 access-list extended v6-acl
11 deny ipv6 host 192.168.4.12 any
Ruijie(config-ipv6-nacl)# exit
```

```
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# ipv6 traffic-filter v6-acl in
```

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

[*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*

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*]

ACL

| | |
|---------------------------|----------|
| expert access-list | ACL |
| ipv6 access-list | IPV6 ACL |
| deny | ACL |

RGOS10.0

57.1.9 list-remark

ACL **no**

list-remark *text*

Text

ACL

ACL

```
Ruijie# ip access-list extended 102
Ruijie(config-ext-nacl)# list-remark this acl is to
filter the host 192.168.4.12
Ruijie(config-ext-nacl)# show access-lists
ip access-list extended 102
deny ip host 192.168.4.12 any
1000 hits
this acl is to filter the host 192.168.4.12
Ruijie(config-ext-nacl)#
```

```
Ruijie# configure terminal
```

```
Ruijie(config)# access-list 88 list-remark
last_comment
```

| | |
|--------------------------|--|
| | |
| show access-lists | |

| |
|-----------------------|
| ip access-list |
|-----------------------|

| |
|----|
| IP |
|----|

RGOS10.0

57.1.10 remark

ACL ACE **no****remark text***Text*

ACL

ACL

Ruijie# **ip access-list extended 102**

Ruijie(config-15 13.onf pl)j/TT15 1 Tf4.79571970TD()Tjrk

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)#
```

| | |
|--------------------------|----------|
| | |
| show access-lists | |
| ip access-list | ip ACL |
| ipv6 access-list | IPV6 ACL |
| deny | ACL |
| permit | ACL |

RGOS10.0

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
    
```

| | |
|----------------------------|-----------------------------------|
| | |
| access-list | |
| show access-lists | |
| show ip access-list | IP 1-199 1300 - 2699 3000 3199 |

RGOS10.0

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
```

| | |
|--------------------------|-----|
| | |
| show access-group | 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

```

| | |
|--------------------------|-----|
| | |
| show access-group | 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
    
```

| | |
|--------------------------|-----|
| | |
| show access-group | 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
```

| | |
|---------------------------|---------------|
| | |
| ip access-list | IP ACL |
| mac access-list | MAC ACL |
| expert access-list | Expert ACL |
| ipv6 access-list | 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.
```

| | |
|-----------------------|--------|
| | |
| ip access-list | IP ACL |

RGOS10.0

57.2.3 show expert access-group

Expert

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

<interface>

Expert ACL

Expert ACL

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

| | |
|----------------------------------|---------------|
| | |
| <u>expert access-list</u> | Expert ACL |

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.
```



| | |
|----------------------|--|
| | |
| show secu-acl | |

RGOS10.2

57.3.2 security access-group

security access-group {*id*|*name*}**no security access-group***id* ACL id*name* ACLRuijie(config-if)#**security access-group** 1

| | |
|----------------------|--|
| | |
| show secu-acl | |

RGOS10.2

57.3.3 security uplink enable

security uplink enable**no security uplink enable**

```
Ruijie(config-if)#security uplink enable
```

| | |
|----------------------|--|
| | |
| show secu-acl | |

RGOS10.2

58 VACL

58.1

```

Vlan access map                               map_name
  map_sn                                       map
      map
'
      vlan access map                           map
  map_sn                                       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 }+

```

```

r . . . . .
+ . . . . . 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 |

```

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

```

```

vlan access map      vlan      vlan
        vlan filter aa vlan-list 1-33      map      1-33
vlan

```

```

map      ff      vlan access map      vlan 5

```

```

Ruijie(config)# vlan filter ff vlan-list 5

```

58.2

58.2.1 show vlan access-map

```

map
show vlan access-map
        map
show vlan access-map map_name

```

```

map_name      map

```

```

show vlan access map

```

```
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

| Show vlan filter access-map <i>map_name</i> | map vlan |
|---|----------|
| show vlan filter vlan <i>vlan_id</i> | map vlan |

Show vlan filter access-map aa

```
Ruijie(config)# show vlan filter
VLAN Map aa
```

Configured on VLANs: 1, 5, 6,

Ruijie(config)#

59 QoS

59.1

QoS

QoS

1

| | | | | | | | | |
|---------------|---|---|----|----|----|----|----|----|
| IP-Precedence | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| | | | 16 | 24 | 32 | 40 | 48 | 56 |

QOS

no set ip dscp

police *rate-bps burst-byte*[**exceed-action** {**drop** | **dscp** *dscp-value*}]

no police

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 0/1
```

```
Ruijie(config-if)# service-policy input po
```

```
Ruijie(config)# virtual-group 3
```

```
Ruijie(config-if)# service-policy input po
```

show mls qos interface

```
S8600                      input output  
virtual-group              output
```

59.2.6 priority-queue

[no] priority-queue

priority-queue SP (S8600)

no priority-queue WRR

WRR

```
Ruijie(config)# no priority-queue
```

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

```
Ruijie(config)# mls qos map dscp-cos 8 10 16 18 to 0
```

show mls qos maps dscp-cos maps,dscp-cos maps
ip-prec-dscp maps

59.2.11 interface rate-limit

rate-limit {input | output} *bps burst-size*

no rate-limit

input

output

bps

burst-size (Kbyte)dscp-list

no

```
Ruijie(config)# interface fastEthernet 0/1  
Ruijie(config-if)# rate-limit input 1000000 4096
```

show mls qos interface

59.2.12 mls qos scheduler

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

no mls qos scheduler

sp

rr

wrr

drr

no

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

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

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

48 24

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

class map

show class-map [*class-name*]

class-name class map

class map

```
Ruijie# show class-map
```

59.3.2 show policy-map

QoS policy map [class class-name]

show policy-map [*policy-name* [**class** *class-name*]]

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

```
Ruijie# show mls qos virtual-group 1
```

```
Ruijie# show mls qos virtual-group policers
```

59.3.5 show mls qos queueing

QoS (cos-to-queue map,wrr weight,drp weight)

```
show mls qos queueing
```

```
Ruijie# show mls qos queueing
```

```
S8600 cos-to-queue map,wrr weight,drp weight
```

59.3.6 show mls qos scheduler

```
show mls qos scheduler
```

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

59.3.7 show mls qos maps

dscp-cos maps,dscp-cos maps

ip-prec-dscp ip-prec-dscp maps

dscp-cos maps dscp-cos maps ip-prec-dscp maps

Ruijie# **show mls qos maps**

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**

59.3.9 show virtual-group

show virtual-group [*virtual-group-number* | **summary**]

virtual-group-number

128

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 | | | | | | | | |
| | | <div style="display: flex; justify-content: space-between; align-items: center;"> / <div style="text-align: center;"> 100% queue1 WRED </div> </div> | | | | | | | | | |

60.2

- > .wrr-queue random-detect max-threshold
- > .wrr-queue random-detect min-threshold
- > .wrr-queue random-detect probability

> .wrr-queue cos-map

60.2.1 wrr-queue random-detect max-threshold

no

wrr-queue random-detect max-threshold *queue_id* *thr1* [*thr2* *thr3*]

no wrr-queue random-detect max-threshold *queue_id*

| <i>queue_id</i> | |
|-----------------|--|
| <i>thr1</i> | |
| <i>thr2</i> | |
| <i>thr3</i> | |

WRED
WRED

WRED

WRED

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

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



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

```



61 VRRP

61.1

VRRP

- ' vrrp authentication
- ' vrrp delay
- ' vrrp description
- ' vrrp ip
- '

```
vrrp 1 authentication x30dn78k
```



```
Ruijie(config-if)# vrrp group ip  
ipaddress [ secondary
```


61.1.4 vrrp ip

```

VRRP
VRRP IP IP no
vrrp group ip ipaddress [secondary]
no vrrp group ip ipaddress [secondary]

group VRRP
ipaddress IP
secondary IP

VRRP

secondary IP IP IP no
VRRP IP IP
VRRP IP IP
1 IP 0 VRRP VRRP
10.0.1.20 IP 10.0.2.20

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

```

| | |
|--|------|
| | |
| Ruijie# show vrrp [brief group] | VRRP |

61.1.5 vrrp preempt

```

VRRP no VRRP

```

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)# vrrp group ip <i>ipaddress [secondary]</i> | VRRP IP |
|---|------------|
| Ruijie(config-if)# vrrp group priority <i>level</i> | VRRP |

61.1.6 vrrp priority

VRRP

no

vrrp group priority level

no vrrp group priority

VRRP

| | |
|---|------------|
| | |
| Ruijie(config-if)# vrrp group ip <i>ipaddress [secondary]</i> | VRRP IP |
| Ruijie(config-if)# vrrp group timers advertise [msec] interval | 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   Routed Port Fa1/1           Fa1/1
VRRP           30   Fa1/1           VRRP
1

```

```
vrrp 1 track FastEthernet 1/1 30
```

```
# VRRP BFD 192.168.1.3
```

```
Ruijie#configure terminal
```

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

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

```
Ruijie(config-if)#no switchport
```

```
Ruijie(config-if)#ip address 192.168.1.1 255.255.255.0
```

```
Ruijie(config-if)#bfd interval 50 min_rx 50 multiplier 3
```

```
Ruijie(config)#interface FastEthernet 0/2
```

```
Ruijie(config-if)#no switchport
```

```
Ruijie(config-if)#ip address 192.168.201.17
```

```
255.255.255.0
```

```
Ruijie(config-if)#vrrp 1 priority 120
```

```
Ruijie(config-if)#vrrp 1 ip 192.168.201.1
```

```
Ruijie(config-if)#vrrp 1 track bfd FastEthernet
```

```
0/1 192.168.1.3 30
```

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

```
' 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# debug vrrp errors | VRRP |
|----------------------------------|------|
| Ruijie# debug vrrp events | VRRP |
| Ruijie# debug vrrp state | 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

```
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
```

```

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#

```

VRRP

```

Ruijie# show vrrp brief
Interface      Grp Pri Time  Own Pre State  Master
addr  Group addr
FastEthernet 0/0  1   100  -   -   P   Backup
192.168.201.213 192.168.201.1
FastEthernet 0/0  2   120  -   -   P   Master
192.168.201.217 192.168.201.2
Ruijie#

```

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

61.3.2 show vrrp interface

VRRP

```
show vrrp interface type number [ brief ]
```

type

number

brief

VRRP

62 BFD

62.1

62.1.1 bfd

```

bfd          BFD
BFD
bfd interval milliseconds min_rx milliseconds multiplier multiplier-value
no bfd interval milliseconds min_rx milliseconds multiplier multiplier-value
    
```

| Interval milliseconds | 6 8 | 6 8 |) \$ag |
|--|-----------|------------------|--------|
| a]b_fl a]` `]gYVtbXg | %\$\$\$ag | YWc |) \$ag |
| Ai`h]d`]Yf ai`h]d`]Yf!j U i Y | 6 8 | 6 8 |) \$ag |
| | %\$\$\$ag | |) \$ag |
| | 50 | multiplier-value | BFD 3 |

BFD

```

r          L3 AP
          BFD
    
```

```

# Routed Port    FastEthernet 0/2    BFD
Ruijie(config)# interface fastEthernet 0/2
Ruijie(config)# no switchport
    
```

```
Ruijie(config-if)# bfd interval 100 min_rx 100 multiplier 3
```

| | |
|---------------------------|----------|
| | |
| bfd all-interfaces | BFD |
| clear bfd | BFD |
| ip ospf bfd | OSPF BFD |
| ip rip bfd | 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
                                BFD
                                ip ospf bfd [disable] ip rip bfd [disable]
                                OSPF RIP BFD

```

```
# OSPF BFD
Ruijie(config)# router ospf 123
Ruijie(config-router)# bfd all-interface
```

| | |
|--------------------|----------|
| | |
| bfd | BFD |
| ip ospf bfd | OSPF BFD |
| ip rip bfd | RIP BFD |

62.1.3 bfd cpp

0


```
Ruijie(config)# no switchport
```

```
Ruijie(config-if)# bfd echo
```

| | |
|-----------------------|------------|
| | |
| bfd | BFD |
| ip redirects | ICMP |
| ip deny land | Land-based |
| bfd slow-timer | |

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

| | |
|-----------------|----------|
| | |
| bfd echo | BFD Echo |

62.1.6 bfd up-dampening

```
bc          ž          UP          ID
```

```
bfd up-dampening [milliseconds]
```

```
no bfd up-dampening
```

| | |
|--|-------------------------------|
| | |
| | fl Ł UP ID |

milliseconds



| | |
|---------|--|
| | |
| 10.3(5) | |

62.1.7 ip ospf bfd

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

| | |
|---------------------------|-----|
| | |
| bfd | BFD |
| bfd all-interfaces | BFD |

62.1.9 ip route static bfd

ip route static bfd **BFD** **no**

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

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

| | |
|---|------------------|
| | |
| j fZ j fZ! bUaY | () VRF |
| <i>] bhYfZUMV! hndY</i> <i>] bhYfZUMV! bi aVYf</i> | |
| <i>[UhYkUm</i> | ID 6 8 ID 6 8 |
| gci fW]d! UXXfYgg | fl Ł 6 8 ID ž ID |

6 8

r 6 8

ï p- Á— ÖRP#• W WG!0W X ÚOö ä"\$U`"• ˘ > • ÖyQN0172re .0.2 d Ô •F„¼T<?>

```

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

```

| | |
|------------|-----|
| | |
| bfd | 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

r ID 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
```

| | |
|------------|-----|
| | |
| bfd | 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 |
| hfUW | fl Ț HfUW |
| <i>bi aVYf</i> | fl ȚhfUW |
| VZX | fl Ț 6 8 |
| <i>] bhYfZUM! hrøY</i> | |
| <i>] bhYfZUM! bi aVYf</i> | fl Ț |
| <i>[UhYkUm</i> | () IP BFD IP BFD |

| | ID | 6 8 |
|---|------|-----|
| r | 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

```

| | |
|------------|-----|
| | |
| bfd | 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    Holddown(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    Holddown(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 (|
| being | 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
```


3

6

```
Ruijie(config)# rerp fail-interval 6
```

| | |
|-----------------------------|--|
| | |
| rerp hello- interval | |

63.1.4 rerp region

RERP

RERP

```
rerp region num
```

```
no rerp region num
```

```
num , 1-64
```

```
Ruijie# rerp region 1
```

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


```

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

```

| | |
|--------------------|------|
| | |
| rerp region | RERP |
| ring | rerp |

63.1.7 major-ring

```

major-ring num edge-ring-vlan vid

```

```

num id

```



```

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

```

```
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

debug rerp [packet | event]

undebug rerp [packet | event]

packet

event

EXEC

| | |
|---|--|
| | |
| show interface switchport backup | |

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

35

fa 0/1 fa 0/2 ,
40

```
Ruijie(config)# interface fa 0/1
Ruijie(config-if)# switchport backup interface fa 0/2
preemption mode bandwidth
Ruijie(config-if)# switchport backup interface fa 0/2
preemption delay 40
```

| | |
|---|--|
| | |
| show interface switchport backup | |

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**

| | |
|--|-----|
| | |
| mac-address-table move update transit | 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**

| | |
|--|-----|
| | |
| mac-address-table move update transit | 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

ID 1

MAC

MAC

MAC

MAC

MAC

```
Ruijie(config-if)# mac-address-table update group 2
```

| | |
|---|-----|
| | |
| show mac-address-table update group detail | 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 :

EXEC

```
Ruijie # show interfaces switchport backup detail
Switch Backup Interface Pairs:
Active Interface      Backup Interface      State
-----
Gi0/23                Gi0/24                Active
Up/Backup Standby
Interface Pair : Gi0/23, Gi0/24
Preemption Mode : Off
Preemption Delay : 35 seconds
Bandwidth : Gi0/23(1000 Mbits), Gi0/24(1000 Mbits)
```

65 RLDP

65.1

RLDP

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

- > rldp port{ unidirection-detect | bidirection-detect | loop-detect } { warning | shutdown-svi | shutdown-port | block }
- > .rldp reset

65.1.2 rldp detect-interval

RLDP

rldp detect-interval *interval*

no rldp detect-interval

| | | |
|--|-----------------|------|
| | | |
| | <i>interval</i> | 2-15 |

| | | |
|--|-----|-----|
| | 3 | |
| | stp | × |
| | | stp |

| | | |
|--|---|---|
| | 5s | : |
| | Ruijie(config)# rldp detect-interval 5 | |
| | rldp detect-max | |

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

65.1.3 rldp detect-max

RLDP

|

|

|

RLDP

RLDP

|

Ruijie(config)# **rldp enable**

|

| | |
|------------------|------|
| | |
| rldp port | RLDP |

|

|

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

65.1.5 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 |

■

■

| | | |
|--|--------------------|------|
| | rldp enable | rldp |
| | | |
| | | |
| | - | - |

65.1.7 rldp reset

| | rldp shutdown | disable | rldp |
|---------------------------|--------------------|---------|------|
| rldp reset | | | |
| | | | |
| | - | | - |
| | | | |
| | | | |
| | | | |
| Ruijie# rldp reset | | | |
| | | | |
| | rldp enable | | Rldp |
| | | | |
| | | | |
| | - | | - |

65.2

- > show rldp
- > debug 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*

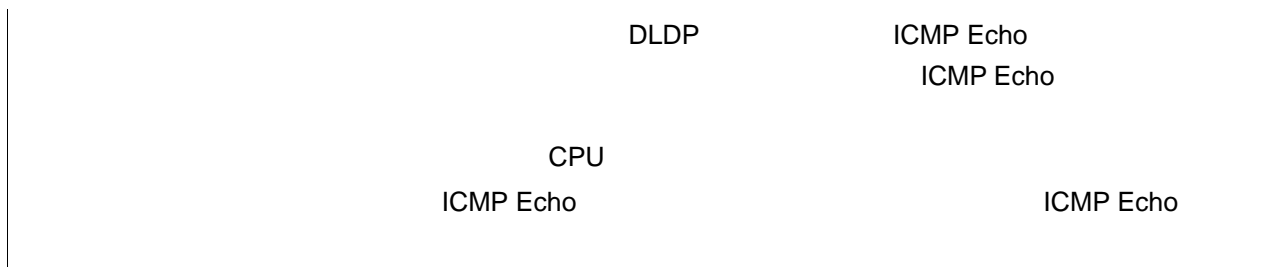
| | | | |
|---------------------|--------|-----------------------|------|
| <i>ip-address</i> | IP | | |
| <i>ipv4-address</i> | IP | | |
| <i>tick</i> | 5 | 5~6000 1tick= 10ms | tick |
| <i>retry-num</i> | 1~3600 | | |
| <i>resume-num</i> | DOWN | UP 1~200 | DLDP |

tick 100tick=1s retry-num 3 resume-num 3

DLDP

1 10.83.132.10 DLDP
Ruijie#**config**

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



```

1      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 passive
    
```

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

10.3(5)

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

66.2

DLDP

statistic

1

Ruijie#show dldp

| Interface | Type | Ip | Next-hop | Interval | Retry | Resume | State |
|-----------|---------|-------------|-------------|----------|-------|--------|-------|
| V12 | Passive | 192.168.6.3 | 192.168.2.2 | 10 | 5 | 3 | Up |
| V13 | Passive | 192.168.7.3 | | 10 | 5 | 3 | Up |
| V14 | Passive | 192.168.3.3 | 192.168.4.2 | 10 | 5 | 3 | Up |

2

vlan 2

Ruijie#show dldp interface vlan2

| Interface | Type | Ip | Next-hop | Interval | Retry | Resume | State |
|-----------|---------|-------------|-------------|----------|-------|--------|-------|
| V12 | Passive | 192.168.6.3 | 192.168.2.2 | 10 | 5 | 3 | Up |

3

Ruijie#show dldp statistic

| Interface | Type | Ip | record-time | Up-count | Down-count |
|-----------|---------|-------------|-------------|----------|------------|
| V12 | Passive | 192.168.6.3 | 2h34m5s | 10 | 9 |
| V14 | Passive | 192.168.3.3 | 1d2h3m52s | 10 | 9 |

4

vlan 2

Ruijie#show dldp statistic interface vlan 2

| Interface | Type | Ip | record-time | Up-count | Down-count |
|-----------|---------|-------------|-------------|----------|------------|
| V12 | Passive | 192.168.6.3 | 2h34m5s | 10 | 9 |

| | | up/down | | | |
|-------------|--|---------------------|---|---|-----|
| | | *y***d**h**m**s | | | |
| record-time | | y | d | h | m s |
| | | Up-count Down-count | | | |
| | | up/down | | | |
| Up-count | | up | | | |
| Down-count | | down | | | |

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

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 TPP

67.1

67.1.1 topology guard

topology guard
no

[no] topology guard

cpu topology-limit

```
Ruijie(config)# topology guard  
Ruijie(config)# no topology guard
```

tp-guard port enable

cpu topology-limit CPU

67.1.2 tp-guard port enable

no

[no] tp-guard port enable

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)#
```

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

1 3600

standard

startup-config

```
Ruijie(config)# redundancy
Ruijie(config-rdnd)# auto-sync time-period 60
Redundancy auto-sync time-period: enabled (60 seconds).
Ruijie(config-rdnd)# exit
Ruijie(config)#
```

```
Ruijie(config)# redundancy
Ruijie(config-rdnd)# no auto-sync time-period
Redundancy auto-sync time-period: disabled.
Ruijie(config-rdnd)# exit
Ruijie(config)#
```

68.1.4 switchover timeout

```
redundancy
switchover
no
```

switchover timeout

switchover timeout *timeout-period*

no switchover timeout

timeout-period 160 25,000

6000

Slave

Master heartbeat

```

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}

```

peer           Slave
shelf  Master  Slave

```

redundancy reload peer

```

Ruijie# redundancy reload peer
Reload peer? [confirm] y
Preparing to reload peer

```

| | |
|---------------|--|
| | |
| reload | |

68.1.6 redundancy forceswitch

```

privileged EXEC          Slave          switchover

```

redundancy forceswitch

```
Ruijie# redundancy forceswitch
Proceed with switchover to standby PRE? [confirm] y
```

| | |
|---------------|--|
| | |
| reload | |

68.2

```
show redundancy [state | auto-sync | switchover]
```

68.2.1 show redundancy state

```
user EXEC    privileged EXEC    show redundancy
redundancy

states      Master  Slave
```

```
Ruijie> enable
Ruijie# configure terminal
Enter configuration commands, one per line. End with
CNTL/Z.
Ruijie# show redundancy states
Redundancy stats:
    my state = 19 -Active
```

```
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`

!;!R•

| | |
|----|--|
| | |
| ls | |

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 ()

```
ruijie# 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

b

jffs2

a (type file); b '?'
'?'

,

Ruijie# **pwd**

69.1.8 rm

rm *FILE*

FILE (

QJ5p

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

5 CPU 5 1
5 CPU 5 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
2    0%   0%   0%   ktimer
3    0%   0%   0%   atimer
```

| | | | | |
|----|----|----|----|-------------------|
| 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_mgc_task |

| | | | | |
|----|----|----|----|------------------------|
| 50 | 0% | 0% | 0% | ospf6d |
| 51 | 0% | 0% | 0% | bgpd |
| 52 | 0% | 0% | 0% | pimd |
| 53 | 0% | 0% | 0% | pim6d |
| 54 | 0% | 0% | 0% | pdmd |
| 55 | 0% | 0% | 0% | dvmrpd |
| 56 | 0% | 0% | 0% | vty_connect |
| 57 | 0% | 0% | 0% | aaa_task |
| 58 | 0% | 0% | 0% | Tlogtrap |
| 59 | 0% | 0% | 0% | dhcp6c |
| 60 | 0% | 0% | 0% | sntp_recv_task |
| 61 | 0% | 0% | 0% | ntp_task |
| 62 | 0% | 0% | 0% | sla_daemon |
| 63 | 0% | 3% | 1% | track_daemon |
| 64 | 0% | 0% | 0% | pbr_guard |
| 65 | 0% | 0% | 0% | vrrpd |
| 66 | 0% | 0% | 0% | psnpd |
| 67 | 0% | 0% | 0% | igsnpd |
| 68 | 0% | 0% | 0% | coa_recv |
| 69 | 0% | 0% | 0% | co_oper |
| 70 | 0% | 0% | 0% | co_mac |
| 71 | 0% | 0% | 0% | radius_task |
| 72 | 0% | 0% | 0% | tac+_acct_task |
| 73 | 0% | 0% | 0% | tac+_task |
| 74 | 0% | 0% | 0% | dhcpd_task |
| 75 | 0% | 0% | 0% | dhcps_task |
| 76 | 0% | 0% | 0% | dhcpping_task |
| 77 | 0% | 0% | 0% | dhcpc_task |
| 78 | 0% | 0% | 0% | uart_debug_file_task |
| 79 | 0% | 0% | 0% | ssp_init_task |
| 80 | 0% | 0% | 0% | rl_listen |
| 81 | 0% | 0% | 0% | ikl_msg_operate_thread |
| 82 | 0% | 0% | 0% | bcmDPC |
| 83 | 0% | 0% | 0% | bcmL2X.0 |
| 84 | 3% | 3% | 3% | bcmL2X.0 |
| 85 | 0% | 0% | 0% | bcmCNTR.0 |
| 86 | 0% | 0% | 0% | bcmTX |
| 87 | 0% | 0% | 0% | bcmXGS3AsyncTX |
| 88 | 0% | 2% | 1% | bcmLINK.0 |
| 89 | 0% | 0% | 0% | bcmRX |
| 90 | 0% | 0% | 0% | mngpkt_rcv_thread |
| 91 | 0% | 0% | 0% | mngpkt_recycle_thread |
| 92 | 0% | 0% | 0% | stack_task |
| 93 | 0% | 0% | 0% | stack_disc_task |
| 94 | 0% | 0% | 0% | redun_sync_task |
| 95 | 0% | 0% | 0% | conf_dispatch_task |

| | | | | |
|-----|-----|-----|-----|------------------------|
| 96 | 0% | 0% | 0% | devprob_task |
| 97 | 0% | 0% | 0% | rdp_snd_thread |
| 98 | 0% | 0% | 0% | rdp_rcv_thread |
| 99 | 0% | 0% | 0% | rdp_slot_change_thread |
| 100 | 4% | 2% | 1% | datapkt_rcv_thread |
| 101 | 0% | 0% | 0% | keepalive_link_notify |
| 102 | 0% | 0% | 0% | rerp_msg_rcv_thread |
| 103 | 0% | 0% | 0% | ip_scan_guard_task |
| 104 | 0% | 0% | 0% | ssp_ipmc_hit_task |
| 105 | 0% | 0% | 0% | ssp_ipmc_trap_task |
| 106 | 0% | 0% | 0% | hw_err_snd_task |
| 107 | 0% | 0% | 0% | rerp_packet_send_task |
| 108 | 0% | 0% | 0% | idle_vlan_proc_thread |
| 109 | 0% | 0% | 0% | cmic_pause_detect |
| 110 | 1% | 1% | 1% | stat_get_and_send |
| 111 | 0% | 1% | 0% | rl_con |
| 112 | 75% | 80% | 90% | idle |

```

          3
          CPU
          LISR HISR
          5
          CPU
          CPU
          No
          5Sec      5      CPU
          1Min      1      CPU
          5Min      5      CPU
          2
          CPU LISR CPU HISR
          CPU CPU
          idle CPU Windows System Idle Process
          idle 5 CPU
          75% CPU 75%

```

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

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% U5CPU
```

```
Oct[01 %SYSCHECK-5-CPU_USING_RATE: CPU
```

show memory

Ruijie#**show memory**

System Memory Statistic:

Free pages: 1079

watermarks : min 379, lower 758, low 1137, high 1516

System Total Memory : 128MB, Current Free Memory :
5283KB

Used Rate : 96%

1. 4k

2.

| min | |
|-------|--------------------------------|
| lower | memory-lack exit-policy |
| low | OVERFLOW |
| high | OVERFLOW |

3.

70.2.2 memory-lack exit-policy

worsen
BGP OSPF RIP PIM-SM
memory-lack exit-policy (bgp|ospf|

show memory protocols

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

/

BGP,OSPF,RIP,LDP,PIM,ISIS

1 show memory protocols

```

MIB          CPU          3          CPU
              CPU
              syslog
              syslog

```

no

threshold set {cpu | memory | temperature} [M1 | M2 | slot *n* | member *n*]
warning_value critical_value

no threshold set {cpu | memory | temperature}

| cpu memory temperature | cpu CPU memory temperature |
|-----------------------------------|--|
| M1 M2 slot <i>n</i> | <i>n</i> |
| member <i>n</i> | <i>n</i> |
| <i>warning_value</i> | cpu memory 1 ~ 100 temperature 0 ~ 2147483647 |
| <i>critical_value</i> | cpu memory 1 ~ 100 temperature 0 ~ 2147483647 |
| no | |

```

CPU          90          100.
              90          100.
              90          100.

```

```

1          M1
Ruijie(config)# threshold set memory M1 70 90

```

```

2          CPU
Ruijie(config)# threshold set cpu member 2 70 90

```

| | |
|-----------------------|--|
| | |
| show threshold | |

70.3.2

> [show threshold](#)

show threshold

show threshold {cpu | memory | temperature} [M1 | M2 | slot *n* | member *n*]

| | |
|-----------------------------------|---|
| | |
| cpu memory temperature | cpu CPU memory temperature |
| M1 M2 slot <i>n</i> | <i>n</i> |
| member <i>n</i> | <i>n</i> |

1

q

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**



| | |
|------------------------|----------------|
| logging monitor | VTY (telnet) |
| logging trap | Syslog Server |

71.1.2 terminal monitor

```

VTY
no
terminal monitor
terminal no monitor

```

```

VTY VTY

```

```

VTY VTY
VTY

```

```

/ . . .
no , RGOS 0 1

```

```

VTY
Ruijie# terminal monitor
Ruijie#

```

71.1.3 logging buffered

```
no
```

```
logging buffered [buffer-size | level]
```

no logging buffered

buffer-size 4K 128K Bytes
levell 0 7

4k Bytes
7

show logging

clear logging
FLASH Syslog Server
RGOS 8
1



```
Ruijie(config)# logging buffered 10000 6
```

| logging on | |
|----------------------|--|
| show logging | |
| clear logging | |

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
```

| | |
|---------------------|---------------|
| | |
| logging on | |
| show logging | |
| logging trap | 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 4i32851.4488 TD<1

```

1.

2.

txt

3.

15

FLASH

FLASH

16

FLASH

trace.txt

64K,

show logging

6

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

| | |
|---------------------|--|
| | |
| logging on | |
| show logging | |

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
```

| logging on | |
|---------------------|--|
| show logging | |

71.1.8 logging trap

Syslog Server

no

Syslog Server

logging trap *level*

no logging trap

level

1

Informational(6)

Syslog Server

| | |
|---------------------|---------------|
| logging on | |
| logging | Syslog Server |
| show logging | |

71.1.9 logging source interface

no

2 Syslog

2

| Numerical Code | Facility |
|-----------------------|--|
| 0 | kernel messages |
| 1 | user-level messages |
| 2 | mail system |
| 3 | system daemons |
| 4 | security/authorization messages |
| 5 | messages generated internally by syslogd |
| 6 | line printer subsystem |
| 7 | network news subsystem |
| 8 | UUCP subsystem |
| 9 | clock daemon |
| 10 | security/authorization messages |
| 11 | FTP daemon |
| 12 | NTP subsystem |
| 13 | log audit |
| 14 | log alert |
| 15 | clock daemon |
| 16 | local use 0 (local0) |
| 17 | local use 1 (local1) |
| 18 | local use 2 (local2) |

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

Ruijie(config)# **logging count**

| show logging count | |
|---------------------------|--|
| show logging | |

71.1.13 logging rate-limit

no

logging rate-limit {*number* | *all number* | *console {number | all number}*}
[*except severity*]

no logging rate-limit

number 1—10000

all 0—7

console

except

error(3) error

severity 0—7;

```
Ruijie(config)#logging rate-limit all 10 except  
warnings
```



Ruijie#configure terminal ----

no

default

service timestamps *message-type* [*uptime* | *datetime* [*msec* | *year*]]

no service timestamps *message-type*

default service timestamps *message-type*

message-type

log debug log

0 6

| | |
|---------------------------------|--|
| logging on | |
| service sequence-numbers | |

71.1.17 service sysname

no

service sysname

no service sysname

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 requested by
Administrator. Reload Reason :Reload command
```



logging file flash:

FLASH

Ruijie# **clear logging**

| logging on | |
|-------------------------|--|
| show logging | |
| logging buffered | |

71.2

71.2.1 show logging

show logging

show logging

```
Ruijie# show logging
Syslog logging: enabled
Console logging: level debugging, 4 messages logged
Monitor logging: level informational, 0 messages logged
Buffer logging: level debugging, 6 messages logged
Timestamp debug messages: datetime
Timestamp log messages: disabled
Sequence log messages: enable
Trap logging: level debugging, 2 message lines logged,0
reserved,0 fail
logging to 202.101.11.22
logging to 192.168.200.112
Log Buffer (Total 4096 Bytes) : have written 680
```

```
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
```

Syslog logging **enabled,**
disabled

Console
logging

VTY

Monitor
logging

Buffer logging

Timestamp
debug
messages

Debug

Timestamp log
messages

Log

Sequence log
messages

Syslog
Server

Trap logging

| logging count | |
|----------------------|--|
| show logging | |
| clear logging | |

71.2.3 show logging reverse

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

| | |
|----------------------|--|
| | |
| logging on | |
| clear logging | |
| show logging | |

72

72.1

- ' **install** *slot-num moduletype*
- ' **no install** *slot-num*
- ' **remove configure module** *slot-num*
- ' **show version module detail**
- ' **show version slots**
- ' **reset module** *slot-num*

72.1.1 install slot-num moduletype

install *slot-num moduletype*

slot-num

moduletype

EH™G!5Ct!m@!@!rT7HÖD!a™G!5B?@

```

Slot      : 2
User Status : installed
Software Status: none
Online Module :
Type      :
Ports     : 0
Version   :
Configured Module :
Type      : M8606-24SFP/12GT
Ports     : 24
Version   :
Ruijie#

```

| no install slot-num | |
|-----------------------------------|--|
| show version module detail | |
| show version slots | |

72.1.2 no install slot-num

no install *slot-num*

slot-num

install

2 24SFP/12GT

Ruijie# **configure terminal**

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

Ruijie(config)# **no install 2**

2006-04-22 09:26:00 @5-CONFIG:Configured from outband

Ruijie(config)# **end**

```

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#

```

| install slot-num moduletype | |
|------------------------------------|--|
| show version slots | |

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

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#
```

| | |
|---------------------------|--|
| | |
| show version slots | |

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 | |



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

R

num 80

num 80 **show running-config** **memory-rate**
rising-threshold 80

Ruijie(config)# **memory-rate rising-threshold 60**

74 USB

74.1

CLI

USB

```
' USB show usb
' USB usb remove
```

74.1.1 show usb

USB

show usb

USB

show usb :

```
Ruijie# sh usb
Device: USB Mass Storage Device :
ID: 778
Lun 0:
ID: 0
Disk Partitions:
1: /dev/uba/disc0/part1 --> /mnt/uba
size : 131072000B(125MB)
```

USB Mass Storage Device

ID ID remove

Lun ID id

Disk Partitions

¥ K€

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
```

POE

```
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
PSE Min Allow Voltage : 45 V
PSE Max Allow Voltage : 57 V
PSE Disconnect Sense Mode : ac
```