

Ruijie

©2010



RGOS®10.3(5)

'
'
'

1.

5

Courier New

5

2.

Arial

C&°

[x|y|...]

//

3.

r

1 CLI

1.1 alias

alias

no

alias *mode command-alias original-command*

no alias *mode [original-command]*

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         globle configure mode

```

```

*
```

```

*command-alias=original-command

```

```

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

```

```

Ruijie# s?

```

```

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

```

```

EXEC          "sv"  "show version"

```

```

Ruijie# s?

```

```

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

```

```

Ruijie# s?

```

```

show start-chat start-terminal-service

```

```

"ia"  "ip address"

```

```

Ruijie(config-if)# ia ?

```

```

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

```

show aliases	

1.2 privilege

privilege **no**

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

mode CLI

all

level 0-15

reset

command-string

privilege

CLI

privilege ?

CLI

config	

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

CLI 1 "test" reload

```
Ruijie(config)# enable secret level 1 0 test
Ruijie(config)# privilege exec level 1 reload
```

1 CLI reload

```
Ruijie> reload ?
<cr>
```

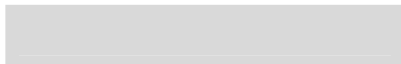
reload 1 all

```
Ruijie(config)# privilege exec all level 1 reload
```

1 CLI reload

```
Ruijie> reload ?
at reload at a specific time/date
cancel cancel pending reload scheme
in reload after a time interval
<cr>
```

,P í© c Ī, Ö



mode

EXEC

EXEC

Ruijie# **show aliases exec**

exec mode alias:

h	help
p	ping
s	show
u	undebug
un	undebug

alias	

2

2.1

CLI

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

2.1.1 **disable**

disable

disable [*privilege-level*]

privilege-level

/

disable

Ruijie# **disable 10**

enable	

2.1.2 enable

enable

2.1.3 enable password

enable password/

```
'          1 26
'
```

r

EXEC

pw10

Ruijie(config)# **enable password** *pw10*

enable secret	

2.1.4 enable secret

enable secret

no

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

no enable secret

Secret

EXEC

Level

0|5

0

5

encrypted-password

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

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
```

line

AAA

VTY console

VTY

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

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

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

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

password	line

2.1.8 login local

AAA

login local no

login local

no login local

line

AAA

```

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

```

username	

2.1.9 login authentication

AAA

AAA

no

login authentication {default | *list-name*}

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

default

list-name

line

AAA

A&E â

A&E \$;X12Dioax 2-Âradnusthentication

2.1.10 username

username

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

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

no username *name*

name

password

0|7 0 7

encrypted-password

privilege-level

r

7

7

7

15

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

login local	

2.1.11 lock

EXEC

lock

lock

1. lock

2.

Locked

3.

line

lockable

line

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

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

```
Ruijie# lock
```

```
Password: <password>
```

```
Again: <password>
```

```
Locked
```

```
Password: <password>
```

```
Ruijie#
```



lockable

Q , È ü,É ð Ç% Â ðÁ€`•@¥ D!ÿQN0=ñf³â

no lockable

line

EXEC **lock**

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

lock	

2.1.13 telnet

telnet EXEC
telnet

telnet *host* [*port*] [*keyword*]

<i>Host</i>	IP	
<i>Port</i>	TCP	23
<i>Keyword</i>		

--	--

/source-interface	telnet
/vrf	VRF

telnet

```

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

```

Show session	TTY
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 IP Telnet
no ip telnet
source-interface

Loopback 1 IP Telnet

```

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

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*

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

clock set

exec-timeout *minutes* [*seconds*]

no exec-timeout

minutes

seconds

10 min

LINE

LINE

line vty 0 5 30 :

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

2.2.4 hostname

hostname

Ü

h3%Ó
h3%Ó

ñ€°í?Är> <ðÀ`# Â ð " &

config-line)

BeiJingAgenda(config)#

2.2.5 session-timeout

	LINE		
session-timeout		no session-timeout	LINE
session-timeout <i>minutes</i> [<i>seconds</i>]			
no session-timeout			

show clock

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

clock set	

2.2.7 show running-config

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

show

2.2.8 show startup-config

```
NVRAM
show startup-config

show startup-config
```

```
NVRAM
startup-config
```

2.2.9 reload

```
reload

reload [ text | in mmm | hhh:mm ]
```

```
in mmm | hhh:mm
at hh:mm month day year                200
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 reload                                show
```

```
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	<i>string</i>	
<i>string</i>		32

EXEC

RGOS

```
Ruijie(config)# prompt RGOS
Ruijie(config)# end
RGOS
```

2.2.12 banner motd

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

```
Ruijie(config)
Ruijie(config)# banner motd $ hello,world $
```

2.2.13 banner login

no banner login banner login

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* | **aux** *line-num* | **vty** *line-num* | *line-num*]

console

```
aux          aux  
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  
Special Chars: Escape Disconnect Activation  
                ^^x      none      ^M  
Timeouts:      Idle EXEC      Idle Session  
                never      never  
History is enabled, history size is 10.  
Total input: 53564 bytes  
Total output: 395756 bytes  
Data overflow: 27697 bytes  
stop rx interrupt: 0 times
```

2.2.16 write

write

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

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 " Ey

VTY 5 0--4

VTY

VTY 20 VTY 0--19

Ruijie(config)# **line vty 19**

VTY 10 VTY 0—9

Ruijie(config)# **line vty 10**

3.1.3 transport input

Line **transport input** Line
default transport input LINE

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

all	Line
ssh	Line SSH
telnet	Line Telnet
none	Line

VTY

TTY

NONE

default transport input

Line

	Line	VTY	
VTY	show running	Line	
r			
	default	transport input	no transport inp
ut	LINE		transpo
rt input none			

```
line vty 0 4          telnet
```

```
Ruijie# configure terminal
```

```
Ruijie(config)# line vty 0 4
```

```
Ruijie(config-line)# transport input telnet
```

```
3:~# telnet 10.10.10.10 23
```

Line

```

Line
access list                               access-class
Line                                       show running

```

```

line vty 0 4                               access-list 10

```

```

Ruijie# configure terminal
Ruijie(config)# line vty 0 4
Ruijie(config-line)# access-class 10 in

```

show running	

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

Xmodem

Xmodem

:

xmodem
xmodem

r

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

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

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

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

5

5.1

- ' **ping**
- ' **traceroute**
- ' **line-detect**

5.1.1 ping

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

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

IP 2 5 100Byte

```

Ping
      ping
      ping
      2      5      100Byte
      IP      !
      .      ping
      ping
      ping
      DNS

```

```
ping
```

```

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

```

```
ping
```

```

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

```

5.1.2 traceroute

```
traceroute
```

```

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

```

vrf-name	VRF

<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
  Open
  D      Short      A B C D      OK C
Length          state OK
                Short  Open  length
```

6

6.1

- ' **interface aggregateport**
- ' **interface giagbitEthernet**
- ' **interface tenGigabitEthernet**
- ' **interface vlan**
- ' **medium-type**
- ' **descriptioin**
- ' **shutdown**
- ' **speed**
- ' **duplex**
- ' **flowcontrol**
- ' **mtu**
- ' **carrier-delay**
- ' **clear counters**
- ' **clear interface**
- ' **switchport**
- ' **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 show interfaces show
interfaces aggregateport

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

show interfaces	

6.1.2 interface giagbitEthernet

interface gigabitEthernet *mod-num/port-num*

mod-num/port-num /

no **show interfaces**
show interfaces gigabitEthernet

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	

6.1.4 medium-type

no

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

fiber

copper

Ap SVI

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

```
Ruijie(config-if)# medium-type copper
```

show interfaces	

```
BASE-T SFP 10/100/1000M
```

6.1.5 description

no

description *string*

no description

string

show interfaces

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

show interfaces	

6.1.6 shutdown

no

shutdown
no shutdown

Ap SVI

auto

Ap Ap
Ap
show interfaces
SFP 10M 100M

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

show interfaces	

6.1.8 duplex

no

duplex {auto | full | half}

no duplex

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

y0l mni0ÂA•i•W•C•D•e•9•0•Q•i•v•A•l•(•B•i•s•E•Ô•A•Y•w•\$,•,•Ö•I•B•ö•W•Â•!•\$•i•S•*•ñ•Á•€

DCD DCD Down Up
DCD

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

no BS





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	vlan-list
	VLAN	VLAN	VLAN
	VLAN ID	VLAN ID	
	-	10-20	,
		1-10,20-25,30,33	
allowed vlan	all	VLAN	
<i>vlan-list</i>	VLAN		
	add	VLAN	VLAN
	remove	VLAN	VLAN
	except	VLAN	%0P DFy A " À0></><! RSe D

```

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          SNMP          LinkTrap
                no          SNMP          LinkTrap

snmp trap link-status
no snmp trap link-status

                Link          SNMP
LinkTrap

                Ap          SVI          Link          SNMP
LinkTrap          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

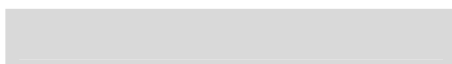
counters

description link

status

switchport

trunk trunking port Aggregate port



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

Aggregate Port no
 Aggregate Port

port-group *port-group-number*
no port-group

Aggregate Port

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

AP VLAN trunk port
 native VLAN AP

1/3 AP 3

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

7.1.2 aggregateport load-balance

AP no

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

no aggregateport load-balance



dst-mac

MAC

8 LACP

8.1

8.1.1 lacp port-priority

LACP

no

lacp port-priority *port-priority*

no lacp port-priority

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

32768

” ‘ ‘

8.1.2 port-group mode

LACP ID no
LACP

port-group key mode active | passive

no port-group

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

LACP

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

--	--

lacp port-priority

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

32768

”

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

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

-	-

8.1.4 lacp system-priority


LACP no

lacp system-priority *system-priority*

no lacp system-priority

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

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



Local information:

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

Partner information:

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

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

9 VLAN

9.1

9.1.1 vlan

```

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

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

```

end Ctrl+C
exit
    
```

```

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

show vlan	VLAN

9.1.2 name

```

VLAN no
name vlan-name
no name
    
```

<i>vlan-name</i>	VLAN

VLAN

VLAN

show vlan vlan

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

show vlan	VLAN

9.1.3 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

switch port access VLAN
switchport access vlan VLAN

switch port trunk VLAN
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

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
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 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 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

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
switchport access	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
-----------------------	-----------

10.1.4 proxy-arp

VLAN ARP

proxy-arp
no proxy-arp

VLAN

end **Ctrl+C**
exit

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

show supervlan	supervlan

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* FE Sv!5B

type

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

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

11.1.3 protocol-vlan profile num vlan id

profile

```
num profile  
id VLAN ID 1-          VLAN
```

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

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

11.2

```
show protocol-vlan
```

11.2.1 show protocol-vlan

Protocol VLAN

show vlan protocol-vlan

Ruijie# **show protocol-vlan**

12 PrivateVLAN

12.1

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

12.1.1 private-vlan type

VLAN VLAN

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

community community VLAN
isolated isolated VLAN
primary primary VLAN
no VLAN

VLAN

```
Ruijie(config)# vlan 22  
Ruijie(config-vlan)# private-vlan primary
```

show vlan private-vlan

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

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

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

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

12.1.6 switchport private-vlan association trunk

private VLAN VLAN	trunk	primary VLAN	secondary
----------------------	-------	--------------	-----------

switchport private-vlan association trunk *p_vid* *s_vid*

no switchport private-vlan association trunk *p_vid* *s_vid*

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

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

p_vid primary VID
svlist 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

12.2

show vlan private-vlan

12.2.1 show vlan private-vlan

private VLAN

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

primary primary VLAN
community community VLAN
isolated isolated VLAN

```
Ruijie# show vlan private-vlan
```

12.3 Hybrid

- ' **switchport mode hybrid**
- ' **switchport hybrid native vlan**
- ' **switchport hybrid allowed vlan**

12.3.1 switchport mode hybrid

```
switchport mode hybrid  
no switchport mode  
        hybrid  
  
no        hybrid
```

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

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
```

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)#
```

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

13.1.2 switchport mode uplink

uplink

switchport mode uplink

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

13.1.4 switchport dot1q-tunnel native vlan

dot1q-tunnel vlan id

switchport dot1q-tunnel native vlan *vid*
no switchport dot1q-tunnel native vlan

vid vlan id

no vlan 1

vlan 1

dot1q-tunnel vid 8

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

show interface dot1q-tunnel

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]
```

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 10-20 vid 100
Ruijie(config)# interface gigabitEthernet 0/1
Ruijie(config-if)# switchport mode access
Ruijie(config-if)# dot1q relay-vid 100 translate
local-vid 10-20
Ruijie(config-if)# end
```

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

13.1.7 traffic-redirect access-group *acl* outer-vlan

```

access,trunk,hybrid vid
traffic-redirect access-group acl outer-vlan vid in
no traffic-redirect access-group acl outer-vlan

acl acl
vid vid
no vid
```

```

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

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

```
show traffic-redirect
```

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

```
access trunk hybrid vid
```

```
traffic-redirect access-group acl inner-vlan vid out
```

```
no traffic-redirect access-group acl inner-vlan
```

```
acl acl  
vid vid  
no vid
```

```
1.1.1.2 vid 6
```

```
Ruijie#configure  
Ruijie(config)#ip access-list standard to_6  
Ruijie(config-acl-std)#permit host 1.1.1.2  
Ruijie(config-acl-std)#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
```

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-acl-std)#permit host 1.1.1.3  
Ruijie(config-acl-std)#exit  
Ruijie(config)#28
```

tpid 0x9100

```
Ruijie(config)# interface g 0/3
Ruijie(config-if)# frame-tag tpid 0x9100
Ruijie(config-if)# end
Ruijie# show frame-tag tpid
Ports  tpid
-----
Gi0/3  0x9100
```

show frame-tag tpid

```
gvrp      gvrp
```

```
no
```

```
gvrp  stp
```

```
Ruijie#configure
```

```
Ruijie(config)# l2protocol-tunnel stp
```

```
Ruijie(config)# l2protocol-tunnel gvrp
```

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

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

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}
```

13.2

- ' **show dot1q-tunnel [interface *intf-id*]**
- ' **show interface [*intf-id*] dot1q-tunnel**
- ' **show frame-tag tpid**
- ' **show inner-priority-trust**
- ' **show registration-table**
- ' **show translation-table**
- ' **show traffic-redirect**
- ' **show]12protocoui Tc -0.0020.001 Tc -0.0025 Tw 1.251 -2.rB3.985 173.3.9850.4003**

```
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
```

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
```

13.2.4 show inner-priority-trust

show inner-priority-trust

```
Ruijie# show inner-priority-trust
Ports inner-priority-trust
```

```
-----  
-----  
Gi0/1  enable
```

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
```

13.2.6 show translation-table

```
access,trunk,hybrid  vid  
  
show translation-table [interface intf-id]  
  
intf-id
```

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

13.2.7 show traffic-redirect

vid

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

intf-id

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

13.2.8 show l2protocol-tunnel

show l2protocol-tunnel{gvrp|stp}

gvrp gvrp

stp stp

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

L2protocol-tunnel: gvrp Disable

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
' snmp trap mac-notification
' address-bind
' address-bind uplink
' address-bind install
' address-bind ipv6-mode
```

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
```


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

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

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 mac-address-table static

no

mac-address-table static *mac-addr* **vlan** *vlan-id* **interface** *interface-id*

no mac-address-table static *mac-addr* **vlan** *vlan-id* **interface**
interface-id

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

```

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	

14.1.6 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	

14.1.7 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

MAC

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

14.1.9 address-bind

ip mac .

address-bind *ip-address mac-address*

no address-bind *ip-address*

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

```

IP          MAC          IP          IP
IP          MAC          IP          IP
MAC

```

ip 3.3.3.3 mac 00d0.f811.1112

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

show address-bind	
--------------------------	--

14.1.10 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	

14.1.11 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	'

14.1.12 address-bind ipv6-mode

ip IP

address-bind ipv6-mode compatible

address-bind ipv6-mode loose

address-bind ipv6-mode strict

		I F V 4 + M A C	i p v 6
		I F V 4 + M A C	I P V 6

			M A C
		I P V 4 + M A C	M A C
			I P V 6

IP 192.168.5.2
IPV6

00d0.f822.33aa

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

- ' **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 [**address** *mac-addr*] [**interface** *interface-id*]
[vlan *vlan-id*]

	'
address <i>mac-addr</i>	' A57
interface <i>interface-id</i>	'
vlan <i>vlan-id</i>	' J@5B

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



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

14.2.2 show mac-address-table aging-time

show mac-address-table aging-time

```
Ruijie# show mac-address-table aging-time
```

```
Aging time      : 300
```

mac-address-table aging-time	

14.2.3 show mac-address-table count

show mac-address-table count

```
Ruijie# show mac-address-table count
```

```
Dynamic Address Count : 51
```

```
Static Address Count  : 0
```

```
Filter Address Count  : 0
```

MAC

Total Mac Addresses : 51

```

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

MAC



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

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

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

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

14.2.9 show mac-address-table vlan

VLAN

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

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

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

Vlan	MAC Address	Type	Interface
------	-------------	------	-----------


```
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
```

```

Ruijie#
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)
-----

```

w ip dhcp snooping	DHCP snooping

Ip dhcp snooping vlan

```

VLAN    DHCP Snooping
no
xn
AÂ5B õ ã ßG!5Bð Àn3&
w    D    x    0
€%o€(

```

ip dhcp snooping	DHCP Snooping

15.1.3 ip dhcp snooping bootp-bind

```

DHCP Snooping      Bootp
                   no          DHCP snooping      Bootp
    
```

[no] ip dhcp snooping bootp-bind

```

          DHCP Snooping      Bootp
DHCP Snooping      Bootp          Bootp
          DHCP Snooping      Bootp
    
```

```

DHCP Snooping      Bootp
    
```

```

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

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 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  
Verification of hwaddr field status    DISABLE  
DHCP snooping database write-delay time: 3600seconds  
DHCP snooping option 82 status: ENABLE  
DHCP snooping Support Bootp bind status: ENABLE  
Interface                          Trusted          Rate limit (pps)  
-----
```

show ip dhcp snooping	DHCP snooping

```
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  
DHCP  
fastethernet 0/2 suppression
```

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

```

show ip dhcp snooping	DHCP snooping

15.2.3 ip dhcp snooping limit rate

DHCP

DHCP Snooping

VLAN

CPP[CPU Protect Protocol]

CPP

DHCP
Snooping

CPP

DHCP

CPP

show ip dhcp snooping

1

100pps configure terminal

DHCP Snooping

DHCP Snooping

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

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

show ip dhcp snooping binding	DHCP snooping

15.4.2 debug ip dhcp snooping

DHCP Snooping

debug ip dhcp snooping {event | packet}

DHCP snooping

DHCP snooping

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

16 IGMP Snooping

16.1

```

IGMP Snooping    profile
Profile
'   range
'   deny
'   permit

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

```

16.1.1 ip igmp profile

```

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

```

no ip igmp profile *profile-number*

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

IGMP Profiles

SVGL
IGMP Filtering
profile

profile

1 profile profile

Ruijie(config)#

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 :

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
    
```


16.1.7 ip igmp snooping svgl profile

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</i> s	profile <1-65535>

profile

IGMP Snooping	SVGL	IVGL-SVGL
SVGL	profile	VLAN
profile	VLAN	VLAN
SVGL		profile 1

```

    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

```

```

/
          IVGL-SVGL          profile
          VLAN
          VLAN          SVGL
          IVGL-SVGL
          IVGL-SVGL

```

```

profile1          igmp snooping          ivgl-svgl
                  SVGL
Ruijie(config)# ip igmp snooping ivgl-svgl
Ruijie(config)# ip igmp snooping svgl profile 1

```

ip igmp snooping svgl	igmp snooping svgl



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

no ip igmp snooping dyn-mr-aging-time



num

VLAN
 VLAN no

snooping igmp

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

ip igmp snooping vlan mrouter interface	

16.1.13 ip igmp snooping vlan mrouter interface

ip igmp snooping vlan mrouter interface no

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

—	
<i>vid</i>	vlan id

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

ip igmp snooping source-check port	

16.1.14 ip igmp snooping vlan static interface

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

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

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

```
vlan1          224.3.3.3
```

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

ip igmp snooping vlan mrouter interface	

16.1.15 ip igmp snooping fast-leave enable

```

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

```

```

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
snooping suppression enable          no          ip igmp
suppression                               igmp snooping

```

```

ip igmp snooping suppression enable

```

no ip igmp snooping suppression enable

disable

```

                IGMP
Report          vlan            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

```

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

IGMP SNOOPING

IGMP

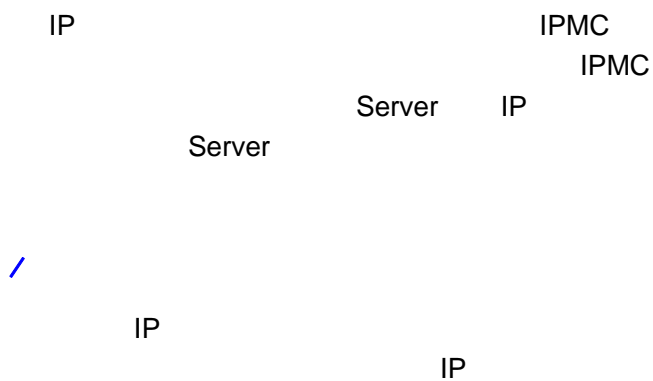
IGMP Sooping
IGMP SNOOPING

VLAN

igmp snooping

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





```
IP IP  
Ruijie(config)# ip igmp snooping source-check  
default-server 1.1.1.1
```

--	--

IP

```
Ruijie(config)# ip igmp snooping limit-ipmc vlan 1  
address 233.3.3.3 server 1.1.1.2
```



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

```

Number: 0 – 1024

IGMP Report

fa0/1 100

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

ip igmp snooping filter	

16.2

- ' **show ip igmp snooping** [*gda-table* | *interface* | *mrouter*]
- ' **show ip igmp profile** [*profile-number*]
- ' **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*

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

EXEC

profile

fa0/1 100

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

Profile 1

Permit

range 224.0.1.0, 239.255.255.255

16.2.3 clear ip igmp snooping gda-table

IGMP Snooping

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

	IGMP Snooping
event	IGMP Snooping
packet	IGMP Snooping
msf	IGMP Snooping
warning	IGMP Snooping

EXEC

17 PIM-Snooping

17.1 PIM-Snooping

PIM-Snooping

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

17.1.1 ip pim snooping

	PIM-Snooping	ip pim snooping
no	PIM-Snooping	

ip pim snooping
no ip pim snooping

PIM-Snooping

```
Ruijie# configure terminal
Ruijie(config)# ip pim snooping
```

/

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

17.1.2 ip pim snooping

	PIM-Snooping	ip pim snooping
no	PIM-Snooping	

ip pim snooping
no ip pim snooping

PIM-Snooping

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

/

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

17.1.3 show ip pim snooping

PIM-Snooping

show ip pim snooping**show ip pim snooping**

PIM-Snooping

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

17.1.4 show ip pim snooping vlan

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

<i>interface-number</i>	VLAN ID

PIM-Snooping VLAN7

```
Ruijie#show ip pim snooping vlan 7
PIM Snooping table:
Interface VLAN 7(4103), PC:2
Port GigabitEthernet 0/7(7), NC:1
Neighbour 4.4.4.1, GenID 0X2f853a91, Holdtime 105s, NLT
75s
Port GigabitEthernet 0/8(8), NC:1
Neighbour 4.4.4.2, GenID 0X38545b24, Holdtime 105s, NLT
77s
```

18 MSTP

18.1

18.1.1 spanning-tree

MSTP

no

MSTP

spanning-tree

MSTP

no

È 1 ò Ð <` %LB JiÂ ò É a• ò Àß "§Ü /

```

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

```

18.1.2 spanning-tree bpdudfilter

```

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

```

```

enabled          BPDUD filter
disabled        BPDUD filter

```

```

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

```

```

show spanning-tree interface      STP

```

18.1.3 spanning-tree bpduguard

```

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

```

```

enabled          BPDUD Guard
disabled        BPDUD Guard

```

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

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

18.1.4 spanning-tree link-type

```
“ ” no
```

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

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

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

```
shared shared
```

```
point-to-point
```

```
shared
```

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

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

18.1.5 spanning-tree max-hops

```
Count          BPDU          Max-hops
              BPDU
              Region
              no
```

```
spanning-tree max-hops hop-count
```

no spanning-tree max-hops

hop-count BPDU 1 40

hop-count 20

.

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

max-hops

Instance

MST Instance Max-hops 10

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

```
show spanning-tree
```

18.1.7 spanning-tree mst configure

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

```
spanning-tree mst configuration
```

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

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

```
end Ctrl+C
```

```
exit
```

```
MST
```

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

```

show           MST region

MST           VLAN 3, 5-10           MST

```

```
Instance 1
```

```
Ruijie(config)# spanning-tree mst configuration
```

```
Ruijie(config-mst)# instance 1 vlan 3 5-10
```

```
Ruijie(config-mst)# name region 1
```

```
Ruijie(config-mst)# revision 1
```

```
Ruijie(config-mst)# show
```

```
MST configuration
```

```
Name [region1]
```

```
Revision 1
```

```
Instance  Vlans Mapped
```

```
-----
```

```
0          1-2,4,11-4094
```

```
1          3,5-10
```

```
-----
```

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

```
Ruijie(config)#
```

```
VLAN 3   Instance 1           MST
```

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

```
Instance 1
```

```
Ruijie(config-mst)# no instance 1
```

```
MST           show
```

```
show spanning-tree mst           MST region
```

```
instance instance-id vlan vlan-range   Vlan           MST Instance
```

```
name           MST
```

```
revision       MST
```

```
show           MST           MST
```

18.1.8 spanning-tree mst cost

```
Instance           no
```

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

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

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

Instance-ID 0

Interface

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

cost

Instance 3 400

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

show spanning-tree mst interface interface-id

show spanning-tree mst MSTP

spanning-tree mst port-priority

spanning-tree mst priority instance

18.1.9 spanning-tree mst port-priority

Instance

Region

no

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

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

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

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

Region

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

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

instance-id 0

priority 32768

Instance 20 8192

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

show spanning-tree mst instance interface interface-id

show spanning-tree mst MSTP

spanning-tree mst cost

spanning-tree mst port-priority Instance

18.1.11 spanning-tree reset

spanning-tree no

spanning-tree reset

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

show spanning-tree STP

show spanning-tree interface STP

18.1.12 spanning-tree tx-hold-count

STP TxHoldCount BPDU
no

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

no spanning-tree tx-hold-count

tx-hold-count TxHoldCount 1 10

3

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

show spanning-tree MSTP

18.1.13 spanning-tree pathcost method

no

spanning-tree pathcost method [long | short]

no spanning-tree pathcost method

long 802.1t path-cost

short 802.1d path-cost

802.1T Path-cost

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

show spanning-tree interface STP

18.1.14 spanning-tree portfast

```

Portfast disabled
Portfast
spanning-tree portfast [disabled]

disabled Portfast

```

```

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

```

```

show spanning-tree interface STP

```

18.1.15 spanning-tree portfast bpduguard default

```

BPDU guard no BPDU
guard
spanning-tree portfast bpduguard default
no spanning-tree portfast bpduguard default

```

BPDU Guard.

```

BPDU guard BPDU error-disabled
show spanning-tree

```

```

Ruijie(config)# spanning-tree portfast bpduguard
default

```

show spanning-tree interface STP

```
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
```



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

spanning-tree autoedge [disabled]

disabled

MSTP

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

18.2

18.2.1 show spanning-tree

spanning-tree max-hops	instance
spanning-tree tx-hold-count	TxHoldCount

18.2.2 show spanning-tree interface

STP 00AE01F612D8

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>	<i>interface-id</i> AP SVI
destination interface <i>interface-id</i>	<i>interface-id</i> AP SVI
both acl name	acl name/id
rx	
tx	
all	
encapsulation	tag ,
switch	

```

switch port    routed port
               SPAN
               SPAN
               SPAN
               disabled port

```

```
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

```

```

r      session 1

```

show monitor	SPAN

19.2 show monitor

SPAN

```
show monitor [session session_number]
```

SPAN

```
session session_number SPAN
```

show monitor

SPAN 1

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-name* [**rx** |
tx | **both**]

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

end Ctrl+C

exit

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

```
Ruijie(config)# monitor session 1 destination  
remote vlan 5 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)# remote-span
```



21 IP

21.1

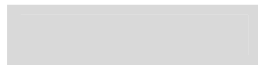
- ' ip address
- ' ip unnumbered

21.1.1 ip address

IP no IP

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

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



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RGOS

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

```

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

                                   FastEthernet 0/1
            IP
ip unnumbered fastEthernet 0/1

```

show interface	

21.2

```

'   arp
'   arp retry interval
'   arp retry times
'   arp trusted NUM
'   arp trusted aging

```

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

clear arp-cache	ARP

21.2.2 arp retry interval

```
2 ARP arp no IP
1 ARP
```

arp

<i>number</i>	ARP <10-7168>

ARP

ARP
ARP

1000

ARP

arp trusted 1000

service trustedarp	ARP

21.2.5 arp trusted aging

ARP

no

arp trusted aging

no arp trusted aging

GSN ARP

ARP

arp timeout

ARP

service trustedarp	ARP

21.2.6 arp unresolve

ARP no
8192

arp unresolve *number*

no arp unresolve

<i>number</i>	ARP < 1-8192 > 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 ARP
120
interface fastEthernet 0/1
arp timeout 120

clear arp-cache	ARP
show interface	

21.2.9 ip proxy-arp

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

ARP

ARP
IP MAC ARP ARP
IP IP ARP MAC IP
MAC ARP MAC

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

no ip broadcast-address *ip-address*

<i>ip-address</i>	IP

IP 255.255.255.255

IP 1 255.255.255.255
 RGOS IP
 1

IP 0.0.0.0

ip broadcast-address 0.0.0.0

21.3.2 ip directed-broadcast

IP **ip**
directed-broadcast no

ip directed-broadcast [*access-list-number*]

no ip directed-broadcast

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

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

 ARP

r

```

    RNFP(Ruijie Network Foundation Protection, )
    mac ( IP) ARP
clear arp 1s
ARP
  
```

ARP

```

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

arp	ARP

21.4.2 show arp

ARP

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

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

incomplete	arp
------------	-----

show arp

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

ARP

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

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

show arp counter

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

21.4.4 show arp detail

```
ARP
```

show arp detail

show arp detail interface-type *interface-number*

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

show arp detail trusted [**ip** [*mask*]]

<i>interface-type interface-number</i>				ARP
vrf <i>vrfname</i>				
<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	
trusted				ARP

```

192.168.0.1    0012.a990.2241    Local    --    VI3    --
192.168.0.1    0012.a990.2241    Local    --    Gi2/3/2    --
  
```

ARP

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

-	-

10.3(5)	10.3(5)

21.4.5 show arp timeout

ARP

show arp timeout

show arp timeout

```

Ruijie# show arp timeout
Interface          arp timeout(sec)
  
```

VLAN 1

3600

ARP

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

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

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

IP interface type is:	
IP interface MTU is:	MTU
IP address is:	IP
IP address negotiate is:	IP

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

ICMP

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

bytes	IP 68~1500

mtu

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

```
FastEthernet 0/1 IP MTU 512
```

```
interface fastEthernet 0/1
ip mtu 512
```

0D7003D4010.00280012 0.0012 DA>.362g175.44 8 1.92 Tc 2 Tr 10.5 0 0 10.5 89.88 590.780



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 unreachable

```
RGOS          ICMP          ip
unreachables no          ICMP

ip unreachable

no ip unreachable
```

RGOS

ICMP

RGOS

ICMP

ICMP

FastEthernet 0/1

ICMP

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

23 DHCP

23.1 DHCP

DHCP

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

23.1.1 bootfile

```
                DHCP                                DHCP
bootfile        no
bootfile file-name
no bootfile
```

<i>file-name</i>	

DHCP

DHCP

DHCP

TFTP

DHCP

next-server

router.conf

bootfile router.conf

ip dhcp pool	DHCP DHCP
next-server	DHCP IP

23.1.2 client-identifier

DHCP

DHCP

client-identifier

no

client-identifier *unique-identifier*

no client-identifier

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

DHCP

```

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

DHCP

```

MAC
00d0.f822.33b4
DHCP

client-identifier
0100.d0f8.2233.b467.6967.6162.6974.4574.6865.726e.65
74.302f.31
    
```

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



DHCP

DNS
DNS

DHCP
DNS

RGOS

DHCP
DHCP

DNS

DHCP

DNS

192.168.12.3

`dns-server 192.168.12.3`

domain-name	DHCP
ip address dhcp	DHCP IP
ip dhcp pool	DHCP DHCP

23.1.6 domain-name

DHCP
no

DHCP

domain-name

domain-name *domain-name*

no domain-name

<i>domain-name</i>	DHCP

DHCP

DHCP


```

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

client-identifier	DHCP
host	IP DHCP
ip dhcp pool	DHCP DHCP

23.1.8 host

```

DHCP IP DHCP
host no DHCP IP
    
```

```

host ip-address [ netmask ]
no host
    
```

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

IP

DHCP

```

DHCP IP
A 255.0.0.0 B 255.255.0
C 255.255.255.0
    
```

DHCP

```

IP 192.168.12.91
255.255.255.240
    
```

```
host 192.168.12.91 255.255.255.240
```

client-identifier	DHCP
hardware-address	DHCP
ip dhcp pool	DHCP DHCP

23.1.9 ip address dhcp

```
PPP HDLC FR          DHCP  IP
      ip address dhcp      no
```

```
ip address dhcp
no ip address dhcp
```

```
DHCP  IP
```

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

```
FastEthernet 0      IP
```

```
interface fastEthernet 0
ip address dhcp
```

dns-server	DHCP DNS

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

23.1.10 ip dhcp excluded-address

IP	DHCP	DHCP
ip dhcp excluded-address		no

23.1.11 ip dhcp ping packet

DHCP ping
ip dhcp ping packet no

ip dhcp ping packet [number]
no ip dhcp ping packet

<i>number</i>	ping 0 10 0 ping

2

DHCP DHCP IP ping
 DHCP Ping
 10

ping 3

ip dhcp ping packets 3

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

23.1.12 ip dhcp ping timeout

DHCP ping
ip dhcp ping timeout no

ip dhcp ping timeout *milli-seconds*

no ip dhcp ping timeout



milli-seconds

DHCP

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

DHCP

DHCP

Ruijie(dhcp-config)#

IP

DNS

mypool0 DHCP

ip dhcp pool mypool0

host	IP DHCP
ip dhcp excluded-address	DHCP IP

<i>days</i>	
<i>hours</i>	
<i>minutes</i>	
'] bZ] b] hY	'

DHCP

DHCP

DHCP

DHCP 1

lease 0 1

DHCP 1

lease 0 0 1

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

WINS

DHCP

WINS
WINS

DHCP
WINS

DHCP

WINS

192.168.12.3

`netbios-name-server 192.168.12.3`

ip address dhcp	DHCP IP
ip dhcp pool	DHCP DHCP

23.1.16 netbios-node-type

DHCP
netbios-node-type

NetBIOS
no

DHCP
NetBIOS

netbios-node-type *type*

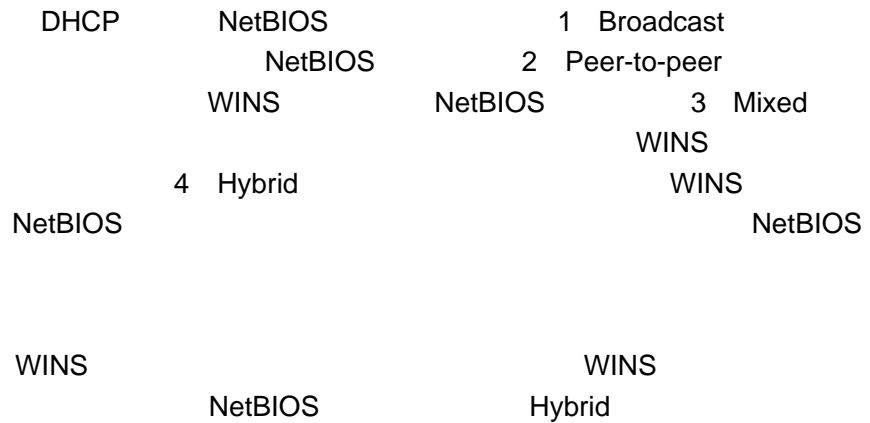
no netbios-node-type

--	--

<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



netbios-node-type h-node

ip dhcp pool	DHCP DHCP
netbios-name-server	DHCP

23.1.17 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

show ip dhcp binding
show ip dhcp conflict

```

DHCP 192.168.12.0
255.255.255.240
network 192.168.12.0 255.255.255.240
    
```

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

23.1.18 next-server

DHCP

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

23.1.19 option

DHCP DHCP option
no option

option code { ascii string | hex string | ip ip-address }
no option

code	DHCP
ascii string	ASCII
hex string	
ip ip-address	IP

DHCP DHCP TCP/IP
DHCP option DHCP 312 option
DHCP DHCP
DHCP option RFC 2131
IP 0 19 IP 1 DHCP
DHCP IP
option 19 hex 1
DHCP 33 DHCP
DHCP *

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

23.1.20 service dhcp

	DHCP		service
dhcp	no	DHCP	
service dhcp			
no service dhcp			

DHCP

DHCP

IP

- ' 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 }
```

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

DHCP ARP ping DHCP
clear ip dhcp conflict

clear ip dhcp conflict *

ip dhcp ping packets	DHCP ping
show ip dhcp conflict	DHCP

23.2.3 clear ip dhcp server statistics

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

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

DHCP

```
clear ip dhcp server statistics
```

show ip dhcp server statistics	DHCP

23.2.4 debug ip dhcp client

DHCP Client

debug ip dhcp client**debug ip dhcp client****no debug ip dhcp client**

dhcp client

dhcp

debug ip dhcp client

23.2.5 debug ip dhcp server

DHCP Server

debug ip dhcp server**debug ip dhcp server****no debug ip dhcp server**

dhcp server

dhcp

debug ip dhcp server

23.2.6 show dhcp lease

DHCP

EXEC

show dhcp lease

show dhcp lease

IP

IP

IP

show dhcp lease

Ruijie# **show dhcp lease**

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

Temp sub net mask: 255.255.255.0

DHCP Lease server: 192.168.5.70, state: 3 Bound

DHCP transaction id: 168F

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

Temp default-gateway addr: 192.168.5.1

Next timer fires after: 00:04:29

Retry count: 0

Client-ID:

redgaint-00d0.f8fb.5740-Fa0/0

23.2.7 show ip dhcp binding

DHCP

EXEC

show ip dhcp binding

show ip dhcp binding [*ip-address*]

<i>ip-address</i>	IP

IP

IP

DHCP

DHCP

show ip dhcp server statistics

```
Ruijie# show ip dhcp server statistics
```

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

Message	Received
BOOTREQUEST	216
DHCPDISCOVER	33
DHCPREQUEST	25
DHCPDECLINE	0
DHCPRELEASE	1
DHCPINFORM	150

Message	Sent
BOOTREPLY	16
DHCPOFFER	9
DHCPACK	7
DHCPNAK	0



FOOO

clear ip dhcp server statistics	DHCP

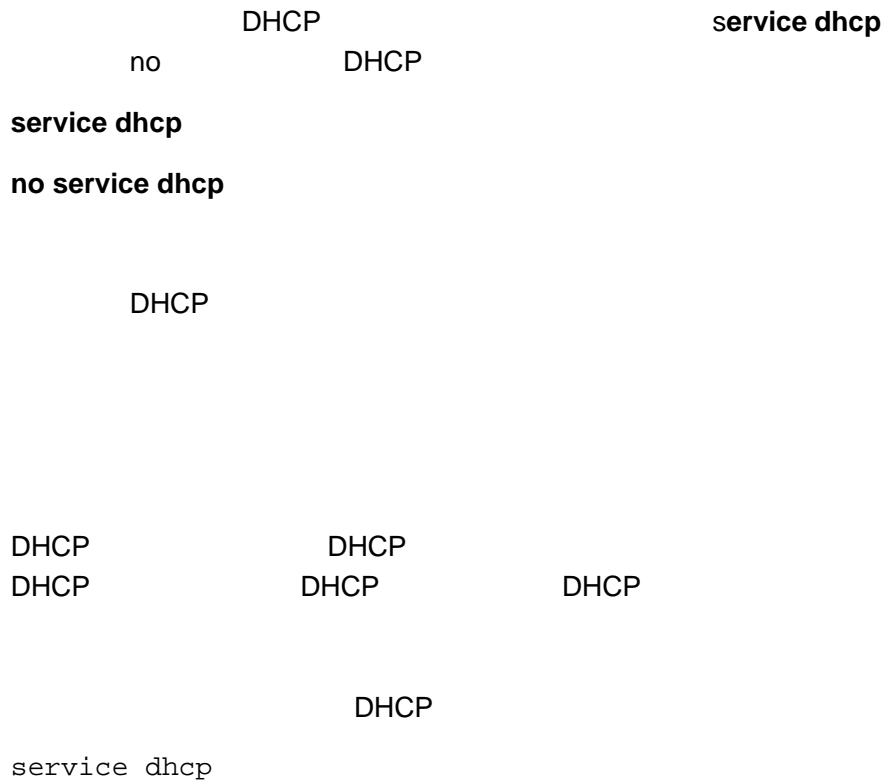
24 DHCP Relay

24.1 DHCP Relay

DHCP

- ' **service dhcp**
- ' **ip helper-address**
- ' **ip dhcp relay information option dot1x**
- ' **ip dhcp relay information option dot1x access-group**
- ' **ip dhcp relay information option82**
- ' **ip dhcp relay check server-id**
- ' **ip dhcp relay suppression**

24.1.1 service dhcp



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

24.1.2 ip helper-address

```

DHCP
no
DHCP

/

dhcp
DHCP

vrf
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
    
```

<code>service dhcp</code>	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

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

service dhcp	DHCP
ip dhcp relay information DHCP	

24.1.5 ip dhcp relay information option82

```
no ip dhcp relay information option82
```

```
option dot1x
```

```
Ip dhcp relay information option82
```

service dhcp	DHCP

```
ip dhcp relay information option82 [TJ /2 Tc 24.4Tc 00 Twc 2 Tr -8 -2.257 <182714D8.8f 0.0057
```

DHCP Relay

25 DNS

25.1

25.1.1 ip domain-lookup

DNS

no

DNS

ip domain-lookup**no ip domain-lookup**

DNS

DNS

DNS

DNS

Ruijie(config)# **ip domain-lookup**

show hosts	DNS

25.1.2 ip name-server

IP

no

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

<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]
```

host-name	""

```
DNS
```

```
1 ip host 2
```

```
DNS
```

```
-IP
```

```
clear host *
```

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	

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

26.1.3 sntp interval

SNTP Client

NTP/SNTP Server

sntp interval *seconds*

no sntp interval

seconds 60 --65535

1800s

show sntp SNTP

Ruijie(config)# **sntp interval 3600**

sntp enable	SNTP
show sntp	SNTP

clock update-calendar

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

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

2

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 0.80u.07p3(Td[(nn)2(trus)810(y)13()]T/C2_0 1 Tf0 Tc0 Tc 10.5 0 0 10.5

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



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

27.1.7 ntp server

NTP

NTP

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

```
no ntp server ip-addr
```

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

NTP

20

prefer

NTP
IP NTP

NTP server

IPv4 Ruijie(config)# ntp server 192.168.210.222

no ntp	NTP

27.1.8 ntp trusted-key

ID

ntp trusted-key *key-id*

no ntp trusted-key *key-id*

<i>key-id</i>	ID

NTP

“

ID

ntp 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**

27.2.1 debug ntp

NTP

debug ntp

no debug ntp

NTP

NTP

debug ntp

27.2.2 show ntp status

NTP

show ntp status

NTP

NTP

NTP

NTP

show ntp status

28 UDP-Helper

28.1

28.1.1 udp-helper enable

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

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          no          UDP
```

```
ip helper-address address
no ip helper-address address
```

<i>address</i>	18D &\$

UDP

UDP, 20 UDP-Helper

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 [

<i>port</i>	69,53,37,137,138,49
tftp	Trivial File Transfer Protocol(69) UDP 69

domain

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  
' show snmp
```

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	<i>text</i>		

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

0 T<2C58>350ETj 546FF1CB

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} traps [vrf vrfname]
[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 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

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



SNMP

IP

SNMP

IP

IP

SNMP

0 IP

SNMP

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

snmp-server enable traps	
snmp-server enable host	NMS

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
                                16
                                MD5          16

```

show snmp user	SNMP

29.1.14 snmp-server group

```

SNMP                                snmp-server group
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                                snmp-server view  
no  
snmp-server view view-name oid-tree {include | exclude}  
no snmp-server view view-name [oid-tree]
```

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

show run	

29.2

29.2.1 show snmp

0 Number of requested variables
0 Number of altered variables
0 Get-request PDUs
0 Get-next PDUs
0 Set-request PDUs
0 SNMP packets output
0 Too big errors (Maximum packet size 1500)
0 No such name errors
0 Bad values errors
0 General errors
0 Response PDUs
0 Trap PDUs
SNMP global trap: disabled
SNMP logging: disabled
SNMP agent: enabled

snmp-server <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*]

30.1.1 rmon collection stats

no

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

no rmon collection stats *index*

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 <i>owner-name</i>]	

RGOS

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

MIB ifInNUcastPkts.6

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

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

30.1.4 rmon event

no

```
rmon event number [log] [trap community] [description-string]
no rmon alarm number
```

trap

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

--	--

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

30.2

30.2.1 show rmon statistics

show rmon statistics

```
Ruijie# show rmon statistics
Statistics : 1
Data source : Gil/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 <i>owner-string</i>]	

30.2.2 show rmon history

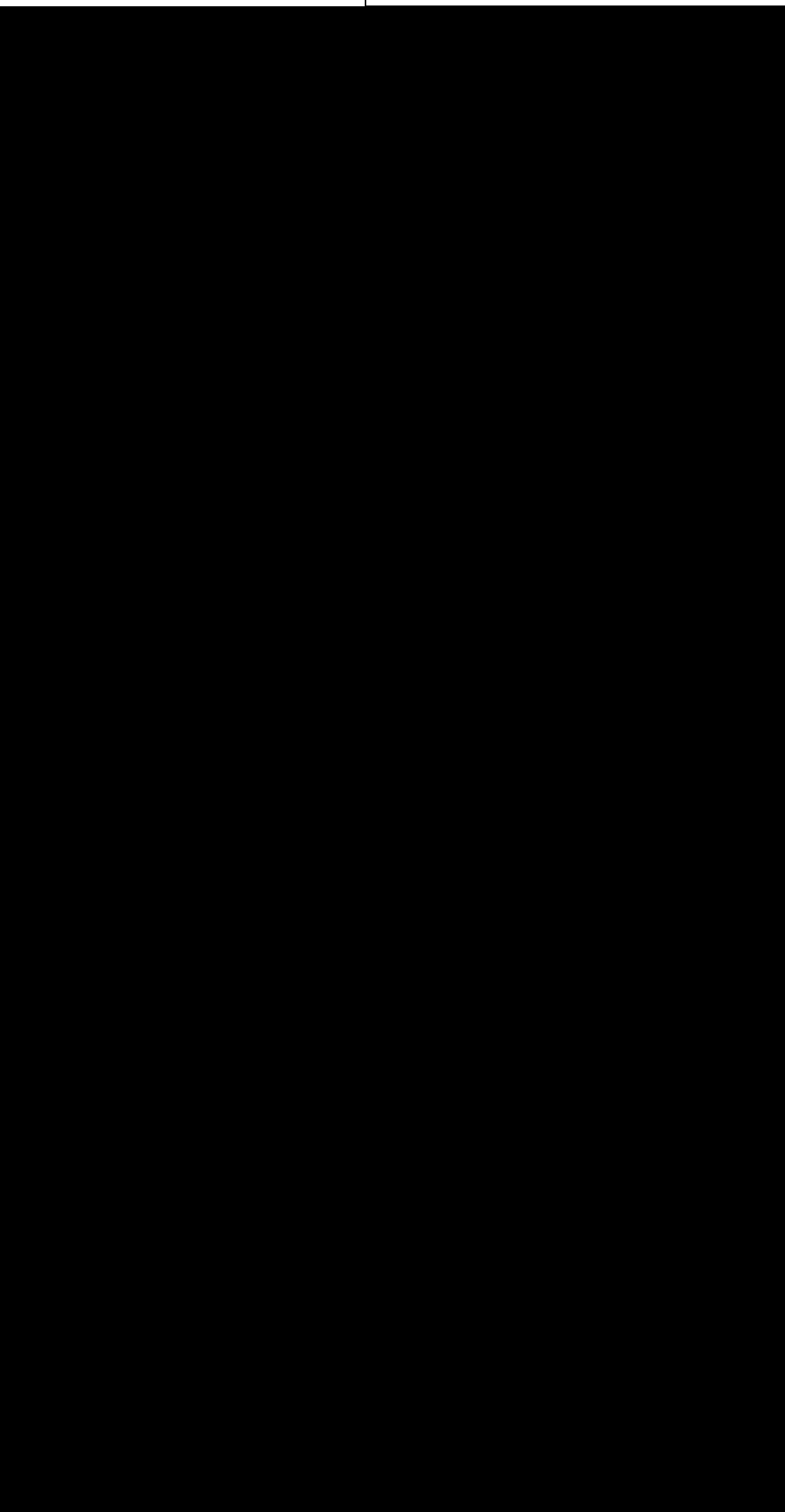
show rmon history

```

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

--	--

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



```

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

31 VRF

31.1 VRF

VRF

```
' show ip route vrf  
' clear ip route vrf  
' ip vrf  
' rd  
' route-target  
' ip vrf forwarding  
' show ip vrf
```

31.1.1 show ip route vrf

VRF

31.1.2 clear 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

31.1.3 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

31.1.4 rd

rd rd_value

```

vrf rd
VRF
VRF
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**

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)

31.1.6 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
```

31.1.7 show ip vrf

VRF

show ip vrf [**brief** | **detail** | **interfaces**] [*vrf-name*]

brief

b r i e f

32 RIP

32.1

32.1.1 address-family RIP

RIP

address-family**no****address-family ipv4 vrf *vrf-name*****no address-family ipv4 vrf *vrf-name***

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

RIP

address-family S*ü

(config-rout]TJ /r-af

```
Ruijie(config)# router rip  
Ruijie(config-router)# address-family ipv4 vrf vpn1  
Ruijie(config-router-af)# network 192.168.1.0  
Ruijie(config-router)# exit-address-family
```

exit-address-family	

ip vrf

VRF

RIPv2

```

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

```

version	RIP	v1	v2
	v1&v2		

32.1.3 default-metric (RIP)

```

RIP
no
default-metric metric
no default-metric

```

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

1

```

redistribute
RIP
RIP
RIP
RIP
default-metric
default-metric
default-metric
default-metric
RIP
RIP
OSPF
RIP
3
Ruijie(config)# router rip

```

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

redistribute	

32.1.4 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 metric
RIP
r
RIP
ip default-network
default-information originate RIP

```

RIP

```

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

```

ip rip default-information	
redistribute	RIP

32.1.5 distance

```

RIP
no
distance distance [ ip-address wildcard ]
no distance [ distance ip-address wildcard ]

```

<i>distance</i>	RIP <1-255>

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
```

32.1.6 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	

32.1.7 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>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	

32.1.8 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	

32.1.9 ip rip authentication key-chain

RIP RIP **ip rip**
authentication key-chain

```

RIPv1      RIP      RIPv2

                Serial 0      RIP      ripchain
    
```

```

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

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

32.1.10 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
    
```

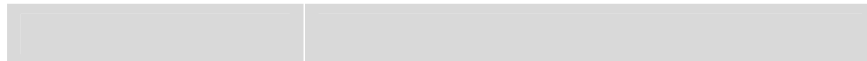
Serial 0

RIP

MD5

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

```
Ruijie(config-if)# ip rip authentication mode md5
```



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

32.1.12 ip rip default-information

```

                                RIP
default-information             no
                                ip rip
ip rip default-information only originate [metric metric-value]
no ip rip default-information

```

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

```

metric 1

```

```

                                ip rip default-information RIP
default-information originate

```

```

r
1                                ip rip default-information RIP
2                                ip rip default-information

```

ethernet0/0

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

default-information originate	RIP

32.1.13 ip rip receive enable

```
RIP
receive enable      no      RIP      ip rip
                   RIP      RIP      RIP
```

```
ip rip receive enable
no ip rip receive enable
```

RIP

```
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

32.1.14 ip rip receive version

```

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

1	RIPv1
2	RIPv2

version

```

RIP
version
RIPv1 RIPv2
version

Fastethernet 0/0
RIPv1 RIPv2
    
```

```

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

version	RIP

32.1.15 ip rip send enable

```

RIP
send enable
no
RIP
RIP
ip rip
RIP
    
```

ip rip send enable

no ip rip send enable

RIP

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

32.1.16 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


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

version	RIP

32.1.18 ip split-horizon (RIP)

```

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

IP

X.25

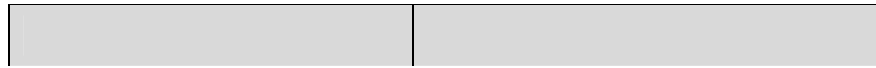
IP

RIP
neighbor
show ip rip
RIP

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

```

RIP



neighbor RIP

RIP

RIP

auto-summary	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
 passive RIP

32.1.22 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

'
interface-number

```

RIP
25
512
25

```

output-delay

```

RIP
30

```

```

Ruijie(config)# router rip
Ruijie(config-router)# output-delay 30

```

32.1.24 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 interface-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

32.1.25 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

OSPF
ISIS level-2
 metric 1
route-map

RIP

RIP

OSPF

RIP

RIP

async default routing

RIP

Ruijie(config)# **router rip**

network (RIP)	RIP

32.1.27 timers basic

RIP

timers basic

no

timers basic *update invalid flush*

no timers basic

--	--

<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

32.1.28 validate-update-source

RIP
validate-update-source no

validate-update-source

no validate-update-source

RIP

RIP
RIP

IP

on

```
                RIP
                rip      rip      metric  distance
                VRF      VRF      VRF-id
```

RIP

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

vrf RIP

```
Ruijie(config-router)# sh ip rip vrf 1
VRF 1 VRF-id:1
Routing Protocol is "rip"
Sending updates every 30 seconds, next due in 4 seconds
Invalid after 180 seconds, flushed after 120 seconds
Outgoing update filter list for all interface is: not
set
Incoming update filter list for all interface is: not
set
Default redistribution metric is 1
Redistributing:
Default version control: send version 1, receive any
version
Routing for Networks:
Distance: (default is 120)
```

32.2.2 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	
-------------	--

32.2.3 show ip rip external

RIP

show ip rip external

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

bgp connected isis ospf static	
vrf <i>vrf-name</i>	VRF RIP
<i>process-name</i>	ISIS
<1-65535>	OSPF

RIP

```
Ruijie# show ip rip external connected
Protocol connected route:
[connected] 1.0.0.0/8 metric=0
nhop=0.0.0.0, if=2
[connected] 3.0.0.0/8 metric=0
[connected] 416E>Tj5 metric=0
nhop=0.0.0.0, if=16391
nhop=0.0.0.0, if=16391
[connected] 416E>Tj7T0 Td<2
nhop=0.0.0.0, if=16391
```

show ip rip	

32.2.4 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

```

```

RIP BFD , :
Ruijie#show ip rip interface
VLAN 1 is up, line protocol is up
Routing Protocol: RIP
  Receive RIPv1 and RIPv2 packets
  Send RIPv1 packets only
  Receive RIP packet: Enabled
  Send RIP packet: Enabled
  Send RIP supernet routes: Enabled
  Passive interface: Disabled
  Split horizon: Enabled
  BFD: Enabled
  V2 Broadcast: Disabled
  Multicast registe: Registered
  Interface Summary Rip:
    Not Configured
  IP interface address:
2.2.2.111/24

```

show ip rip	

32.2.5 show ip rip peer

```

RIP      RIP      (RIP      )
      RIP      show ip rip peer
show ip rip peer [ip-address] [vrf vrf-name]

```

<i>ip-address</i>	RIP
vrf vrf-name	VRF RIP

33 OSPF

33.1

33.1.1 area

```

no OSPF
area area-id
no area area-id
    
```

'	'
' UfYU!]X	' CGD: ID

OSPF

'	'
' bYhkcF_ UfYU	' CGD: CGD:

33.1.2 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
ospf authentication-key **ip**
message-digest-key MD5 **ip ospf**

OSPF 0 MD5
backbone

```
Ruijie(config)# interface FastEthernet 0/0
Ruijie(config-if)# ip address 192.168.12.1
255.255.255.0
Ruijie(config-if)# ip ospf message-digest-key 1 md5
backbone

# OSPF

Ruijie(config)# router ospf 1
Ruijie(config-router)# network 192.168.12.0
0.0.0.255 area 0
Ruijie(config-router)# area 0 authentication
message-digest
```

'	'
']d U h\Ybh] WWh] cb! _Ym	cgdZ , CGD:
']d aYggU[Y! X] [Ygh! _Ym	cgdZ , CGD: A8)
']d UFYU j] fhi U ! `] b_	'

33.1.3 area default-cost

STUB NSSA OSPF
area default-cost no

```
area area-id default-cost cost
no area area-id default-cost
```

area-id	STUB NSSA
cost	STUB NSSA

```

                                ABR
                                STUB
                                NSSA
                                ABR
                                ABR
                                STUB
                                NSSA
                                area
stub area nssa area default-cost
                                STUB
                                area
                                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

33.1.4 area filter-list

```

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

```


UFYU] X	BGG5
bc! fYX] ghf] Vi h] cb	bggU 56F bggU
XYZU ` h!] bZcf aUh] cbl cf] [] bUhY	+ @G5 bggU BGG5 56F 5G6F
bc! gi aaUfm	bggU f156Ft @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 nssa
 ASBR ABR
 NSSA LSA
 ABR no-summary ABR NSSA
 summary LSAs Type-3 LSA
area default-cost NSSA NSSA ABR
 NSSA 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	OSPF NSSA

33.1.6 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]
```

area-id	OSPF IP
ip-address	
advertise not-advertise	
cost cost	

```

RFC1583
RFC1583
cost
cost
cost

```

ABR

advertise not-advertise

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 172.16.16.0 255.2
55.240.0

```

33.1.7 area stub

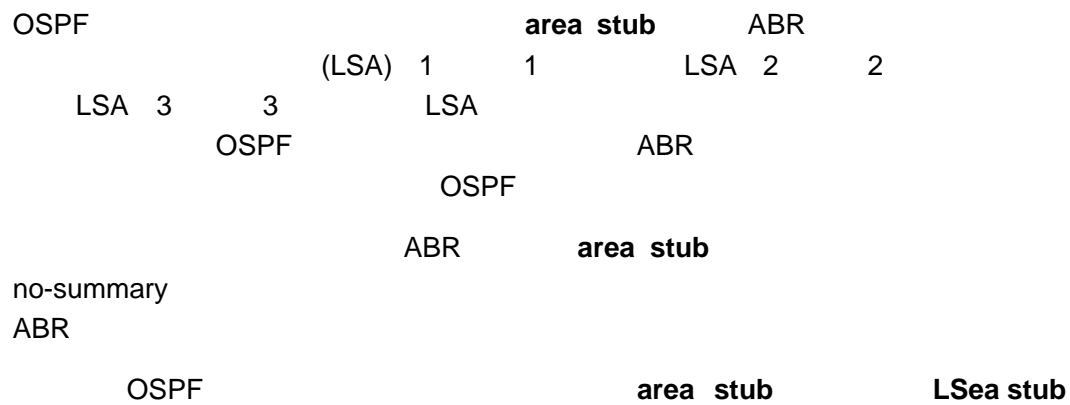
```

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

```

<i>area-id</i>	STUB

no-summary	<p style="text-align: center;">ABR</p> <p style="text-align: right;">ABR</p>
-------------------	--



33.1.8 area virtual-link

OSPF
no

area virtual-link

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 <i>seconds</i>	40
hello-interval <i>seconds</i>	OSPF Hello 10
retransmit-interval <i>seconds</i>	OSPF LSA 5

OSPF

transmit-delay *seconds*

null	
------	--

```
dead-interval 40
hello-interval 10
retransmit-interval 5
transmit-delay 1
;
```

OSPF

area authentication	OSPF
show ip ospf	OSPF

EPOA,

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

33.1.10 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
```

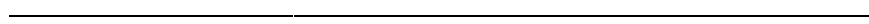
33.1.11 compatible rfc1583

AS
RFC1583

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



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



OSPF

1

50

OSPF

```
Ruijie(config)# router ospf 1
Ruijie(config-router)# network 172.16.24.0 0.0.0.255
area 0
Ruijie(config-router)# default-information originate
always metric 50 metric-type 1
```

show ip ospf database	OSPF
show ip route	IP

33.1.13 default-metric

OSPF

default-metric no

default-metric *metric*

no default-metric

<i>metric</i>	OSPF

20

default-metric redistribute

default-metric OSPF default-information originate

```

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

33.1.14 distance ospf

OSPF

```

distance ospf {intra-area <1-255> | inter-area <1-255> | external
<1-255>}

```

```
no distance ospf
```

intra-area <1-255>	110
inter-area <1-255>	110
external <1-255>	110

110

OSPF

OSPF

OSPF

160

```
Ruijie(config)# router ospf 1
Ruijie(config-router)# distance ospf external 160
```

33.1.15 distribute-list in

LSA

distribute-list {*listname* | **gateway** *plist-name* | **prefix** *plist-name* }
in [*interface-type* *num*]

no distribute-list {*listname* | **gateway** *plist-name* | **prefix** *plist-name* }
in [*interface-type* *num*]

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

LSA

SPF

OSPF

ABR

ASBR

```
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
```

33.1.16 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]	

distribute-list out	redistribute route-map
OSPF	
redistribute	ACL prefix-list

prefix-list , ACL ,

```
Ruijie(config)# router ospf 1
Ruijie(config)# redistribute static subnets
Ruijie(config-router)# distribute-list 22 out static
Ruijie(config-router)# distribute-list prefix jjj
outstatic
% There already has filter configured. Please
OSPFv2-MIB OSPFv2
```

33.1.17 enable mib-binding

```
enable mib-binding MIB OSPFv2
no
enable mib-binding
no enable mib-binding
```


MIB OSPFv2

```

SNMP          100  OSPFv2
Ruijie(config)# router ospf 100
Ruijie(config-router)# enable mib-binding
    
```

show ip ospf	OSPF
enable traps	OSPF TRAP

33.1.18 enable traps

```

OSPFv2          16  TRAP          4
                TRAP          no
                TRAP
    
```

enable traps [error [ifauthfailure | ifconfigerror | ifrxbadpacket | virtifauthfailure | virtifconfigerror | virtifrxbadpacket] | lsa [lsdbapproachoverflow | lsdboverflow | maxagelsa | originatelsa] | retransmit [iftxretransmit | virtiftxretransmit] | state-change [ifstatechange | nbrstatechange | virtifstatechange | virtnbrstatechange]]

no enable traps [error [ifauthfailure | ifconfigerror | ifrxbadpacket | virtifauthfailure | virtifconfigerror | virtifrxbadpacket] | lsa [lsdbapproachoverflow | lsdboverflow | maxagelsa | originatelsa] | retransmit [iftxretransmit | virtiftxretransmit] | state-change [ifstatechange | nbrstatechange | virtifstatechange | virtnbrstatechange]]

--	--

<p>error</p>	<p>error traps error traps</p> <p>ifauthfailure ifconfigerror ifrxbadpacket virtifauthfailure virtifconfigerror virtifrxbadpacket</p>
	<p>33-22</p>

lsa	<p>lsa traps</p> <p>lsdbapproach overflow</p> <p>lsdboverflow</p> <p>maxagelsa originatelsa</p> <p>L</p>
	33-23

retransmit	retransmit traps retransmit traps iftxretransmit virtiftxretransmit
-------------------	--

<p>state-change</p>	<p>state-change traps state-change traps ifstatechange nbrstatechange virtifstatechange virtnbrstatechange</p>
----------------------------	---

TRAP

snmp-server
enable traps ospf

MIB

snmp-server

TRAP

OSPFv2 100 TRAP

Ruijie(config)# **router ospf 100**Ruijie(config)# **enable traps**

show ip ospf	OSPF
enable mib-binding	OSPFv2 MIB

33.1.19

```
Ruijie(config)# interface fastethernet 0/0
Ruijie(config-if)# ip address 172.16.10.0
255.255.255.0
Ruijie(config-if)# ip ospf authentication
message-digest
```

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

33.1.20 ip ospf authentication-key

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

Key	8

```
ip ospf authentication-key      OSPF
OSPF
```


OSPF 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

LSA

LSA

LSA serial 1/0

```
Ruijie(config)# interface serial 1/0
Ruijie(config-if)# ip address 172.16.10.1
255.255.255.0
Ruijie(config-if)# encapsulation ppp
Ruijie(config-if)# ip ospf database-filter all out
```

33.1.23 ip ospf dead-interval

```
OSPF ip
ospf dead-interval no
ip ospf dead-interval seconds
no ip ospf dead-interval
```

<i>seconds</i>	

ip ospf hello-interval

```
OSPF Hello OSPF
Hello hello 4 hello
```



```
Ruijie(config-if)# ip address 172.16.10.1
255.255.255.0
Ruijie(config-if)# ip ospf disable all
```

33.1.25 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

```


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
```

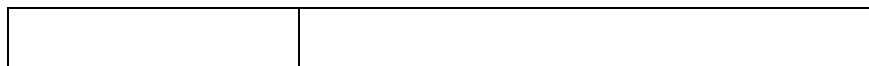
area authentication	OSPF
ip ospf authentication	

33.1.27 ip ospf mtu-ignore

mtu

no

```
ip ospf mtu-ignore
no ip ospf mtu-ignore
```



mtu

OSPF MTU , MTU
MTU, , MTU

serial 1/0 MTU

```
Ruijie(config)# interface serial 1/0  
Ruijie(config-if)# ip ospf mtu-ignore
```

' 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

frame-relay map X.25 **X.25 map**

OSPF X.25

OSPF

'

'

broadcast X.25 IP

Ruijie(config)#

ip ospf priority *priority*
no ip ospf priority

<i>Priority</i>	OSPF

```

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

```

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

33.1.30 ip ospf retransmit-interval

LSU

ip ospf transmit delay *seconds*

no ip ospf transmit delay

<i>Seconds</i>	OSPF LSU 1

1

LSU

LSAs

Age

ip ospf transmit delay

LSU

area

virtual-link

retransmit-interval

RGOS

Age

3600

LSA

LSA

serial1/0

5

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

Ruijie(config-if)# **ip ospf transmit delay 10**

area virtual-link	OSPF

33.1.32 log-adj-changes

no default

log-adj-changes [detail]

no log-adj-changes [detail]

]

OSPF

DD

DD

4

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

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

33.1.34 neighbor

OSPF

neighbor

no

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

```
no neighbor ip-address
```

```
4 366 re5.12 rW* n0.8 Tr g0 1 Tf0.0057 Tc 2 Tr 10.5 0 0 10.5 89.88 75192_0 37m<47213542
```

```

RGOS
IP
    NBMA
        Hello OSPF Hello Hello
            0 Hello OSPF 0
DR/BDR DR/BDR DR/BDR
Hello
    ,
    ,
        cost
    .
    
```

```

172.16.24.2 OSPF IP
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

33.1.35 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

```

ip-address  wildcard
            OSPF
            IP      network area      IP      OSPF
area        IP      network          IP      network
OSPF
            OSPF  network          IP
            OSPF
    
```

```

0 1 172.16.16.0  IP
192.168.12.0/24 1 IP
172.16.16.0/20 172.16.16.0
0
    
```

```

Ruijie(config)# router ospf 20
Ruijie(config-router)# network 172.16.16.0
0.0.15.255 area 172.16.16.0
Ruijie(config-router)# network 192.168.12.0
0.0.0.255 area 1
Ruijie(config-router)# network 0.0.0.0 255.255.255.255
area 0
    
```

router ospf	OSPF

33.1.36 overflow database

OSPF LSA

overflow database <0-4294967294> **hard | soft**
no overflow database

<1-4294967294>	LSA
hard soft	hard LSA OSPF soft LSA

OSPF **hard** OSPF
soft

LSA 10 OSPF 10

```
Ruijie# config terminal
Ruijie(config)# router ospf 10
Ruijie(config-router)# overflow database 10 hard
```

33.1.37 overflow database external

external LSA

overflow database external *max-dbsize wait-time*
no overflow database external

--	--

<i>max-dbsize</i>	external lsa	AS
	0-2147483647	
<i>wait-time</i>		0-65535

external-LSA

external-LSA

external-LSA

external-LSA

max-dbsize

external-LSA

external-LSA

wait-time

external-LSA

Ruijie# **config terminal**Ruijie(config)# **router ospf 10**Ruijie(config-router)# **overflow database external 10 3**

33.1.38 overflow memory-lack

OSPF

OVERFLOW

no

overflow memory-lack**no overflow memory-lack**

OSPF

OVERFLOW

OSPF OVERFLOW

OSPF OVERFLOW

OSPF NULL
OVERFLOW

clear ip ospf process OSPF
OSPF OVERFLOW

no OSPF OVERFLOW
OSPF

OSPF OVERFLOW

```
Ruijie# config terminal
Ruijie(config)# router ospf 10
Ruijie(config-router)# no overflow memory-lack
```

clear ip ospf process	OSPF
show ip protocols ospf	OSPF

33.1.39 passive-interface

no

passive-interface [default | *type number*]

no passive-interface [default | *type number*]

<i>type number</i>	
default	

bgp isis <i>area-tag</i> ospf <i>process-id</i> 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	

```

                                ASBR          OSPF
                                OSPF
                                metric  1
                                level
                                level
                                level 1, level 2
                                level-1-2
                                ospf          match
                                ospf          match
                                match          match
                                                no
                                route-map     route-map   match
                                                OSPF   ISIS
                                match  level   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
```

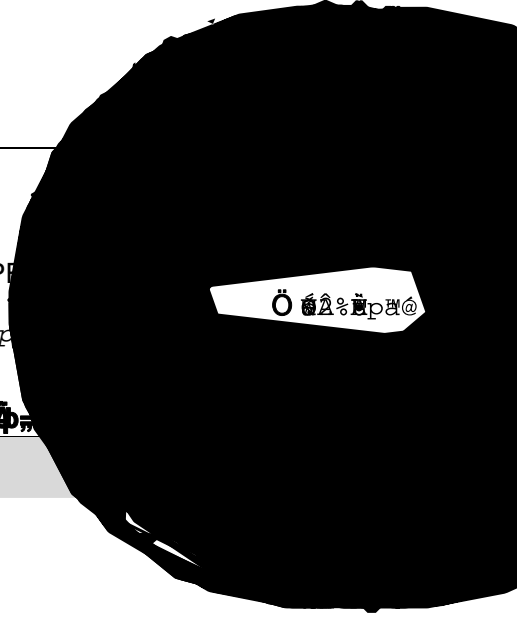
level-1no1 1 Tf 0 Tc 0 Tw 4.1.091 A5104E153614Ej/F44C3813C6116E06<D71D70 1 Tf 0.0003 Tc 21 0 T8

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

```
œ@ OSPF
```

--	--

```
show ip protocols
```



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

show ip protocols	

33.1.43 summary-address

OSPF

T / J T] > 4 C summary-address 0 E 6 no [> 0 D 1 0 < 6 > 1 - 9

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

33.1.44 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

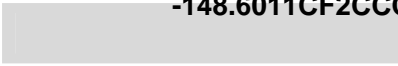
10000 LSA
10~20

40~100

120

Ruijie(config)#**router ospf 20**

Ruijie(config-router)#**timers lsa-group-pacing 120**

 **-148.6011CF2CCC07470A re175.476.46.78 mh318 -2259.06 -138.3 -495.84**

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

33.1.46 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-holdtime</i>	SPF 1-6c 2c
<i>spf-max-waittime</i>	SPF 1-6c 2c

spf-delay 1 2c

spf-holdtime 5 2c

spf-max-waittime 12 2

spf-delay

SPF

SPF

	OSPF	SPF	
5	1000	90000	SPF

5ms 1s 3s 7s 15s 31s 63s 89s 179s 179+90

Ruijie(config)# **router ospf 20**

Ruijie(config-router)# **timers spf 5 1000 90000**



OSPF

show ip ospf

```
Ruijie# show ip ospf
Routing Process "ospf 1" with ID 1.1.1.1
Process uptime is 4 minutes
Process bound to VRF default
Conforms to RFC2328, and RFC1583Compatibility flag
isenabled
Supports only single TOS(TOS0) routes
Supports opaque LSA
This router is an ASBR (injecting external routing
information)
SPF schedule delay 5 secs, Hold time between two SPFs
10 secs
LsaGroupPacing: 240 secs
Number of incoming current DD exchange neighbors 0/5
Number of outgoing current DD exchange neighbors 0/5
Number of external LSA 4. Checksum 0x0278E0
Number of opaque AS LSA 0. Checksum 0x000000
Number of non-default external LSA 4
External LSA database is unlimited.
Number of LSA originated 6
Number of LSA received 2
Log Neighbor Adjacency Changes : Enabled
Number of areas attached to this router: 1
Area 0 (BACKBONE)
Number of interfaces in this area is 1(1)
Number of fully adjacent neighbors in this area is 1
Area has no authentication
SPF algorithm last executed 00:01:26.640 ago
SPF algorithm executed 4 times
Number of LSA 3. Checksum 0x0204bf
Area 1 (NSSA)
Number of interfaces in this area is 1(1)
Number of fully adjacent neighbors in this area is 0
Number of fully adjacent virtual neighbors through this
area is 0
Area has no authentication
SPF algorithm last executed 02:09:23.040 ago
SPF algorithm executed 4 times
Number of LSA 6. Checksum 0x028638
NSSA Translator State is elected
```

OSPF BFD ,

SPF algorithm last executed 02:09:23.040 ago

SPF algorithm executed 4 times

Number of LSA 6. Checksum 0x028638

NSSA Translator State is elected

Router ID	
Process uptime	OSPF router-id 0.0.0.0
Bound to VRF	OSPF VRF
Conforms to RFC2328	RFC2328
RFC1583Compatibility flag	RFC2328 RFC1583 ASBR
Support Tos	TOS0
Supports opaque LSA	opaque-LSA
Router Type	OSPF normal ABR ASBR
SPF Delay	SPF
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	opaque-LSA
Opaque LSA Checksum Sum	opaque-LSA
Number of non-default external LSA	external-LSA
External LSA database limit	external-LSA

Exit database overflow state interval	overflow
Database overflow state	OSPF overflow
Number of LSA originated	LSA
Number of LSA received	LSA
Log Neighbor Adjency Changes	
Number of areas attached to this router	
Area type	, Default, Stub,NSSA
Number of interfaces in this area	
Number of fully adjacent neighbors in this area	Full
Number of fully adjacent virtual neighbors through this area	Full
Area authentication	
SPF algorithm last executed	SPF
SPF algorithm executed times	SPF
Number of LSA	LSA
Checksum Sum	LSA
NSSA Translator State	LSA NSSA External ABR OSPF
BFD is enabled	OSPF BFD

33.2.2 show ip ospf border-routers

ABR/ASBR OSPF
show ip ospf border-routers
show ip ospf [process-id] border-routers

	V 7
<i>process-id</i>	ospf

à

OSPF ABR ASBR OSPF
show ip route OSPF
 OSPF

show ip ospf border-routers

OSPF

OSPF

show ip ospf database

Ruijie# **show ip ospf database**

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



```

Advertising Router: 1.1.1.1
LS Seq Number: 80000001
Checksum: 0xbe8c
Length: 28
Network Mask: /0
TOS: 0 Metric: 1
    
```

show ip ospf database asbr-summary

OSPF Router with ID	OSPF
AS Summary Link States	AS
LS age	
Options	
LS Type	
Link State ID	
Advertising Router	
LS Seq Number	
Checksum	
Length	
Network Mask	
TOS	TOS 0
Metric	

show ip ospf database external

```

Ruijie# show ip ospf database external
OSPF Router with ID (1.1.1.35) (Process ID 1)
AS External Link States
LS age: 752
Options: 0x2 (*|-|-|-|-|E|-)
LS Type: AS-external-LSA
Link State ID: 20.0.0.0 (External Network Number)
Advertising Router: 1.1.1.1
LS Seq Number: 8000000a
Checksum: 0x7627
    
```

```

Length: 36
Network Mask: /24
Metric Type: 2 (Larger than any link state path)
TOS: 0
Metric: 20
Forward Address: 0.0.0.0
External Route Tag: 0
    
```

show ip ospf database external

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 0
Metric	
Forward Address	0.0.0.0 IP
External Route Tag	32 OSPF OSPF

show ip ospf database network

```

Ruijie# show ip ospf database network
OSPF Router with ID (1.1.1.1) (Process ID 1)
    
```

Network Link States (Area 0.0.0.0)

```

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

show ip ospf database network

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
Router Link States	
LS age	
Options	
Flag	router
LS Type	
Link State ID	
Advertising Router	
LS Seq Number	
Checksum	

Length

```
Ruijie# show ip ospf database summary
OSPF Router with ID (1.1.1.1) (Process ID 1)
Summary Link States (Area 0.0.0.0)
LS age: 499
Options: 0x2 (*|-|-|-|-|E|-)
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	

External Route Tag	<div style="text-align: right;">32</div> <div style="text-align: center;">OSPF</div> <div style="text-align: right;">OSPF</div>
--------------------	---

show ip ospf database external

```

Ruijie# show ip ospf database external
OSPF Router with ID (1.1.1.1) (Process ID 1)
AS External Link States
LS age: 1290
Options: 0x2 (*|---|E|)
LS Type: AS-external-LSA
Link State ID: 20.0.0.0 (External Network Number)
Advertising Router: 1.1.1.1
LS Seq Number: 8000000a
Checksum: 0x7627
Length: 36
Network Mask: /24
Metric Type: 2 (Larger than any 1 >9 State IDpath
    
```

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

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

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

OSPF OSPF

show ip ospf interface FastEthernet 1/0

```
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
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
```

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

Designated Router(ID)	DR
DR's Interface address	DR
Backup designated router(ID)	BDR
BDR's Interface address	BDR

<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
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

Thread Database Description Retransmission	DD
Thread Link State Request Retransmission	LS
Thread Link State Update Retransmission	LS
Thread Poll Timer	Poll Timer

33.2.6 show ip ospf route

```
ospf
```

```
show ip ospf [process-id] route[count]
```

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

```
Ruijie# show ip ospf route
```

```
OSPF process 1:
```

```
Codes: C - connected, D - Discard, O - OSPF,
```

```
IA - OSPF inter area N1 - OSPF NSSA external type 1,
```

```
N2 - OSPF NSSA external type 2
```

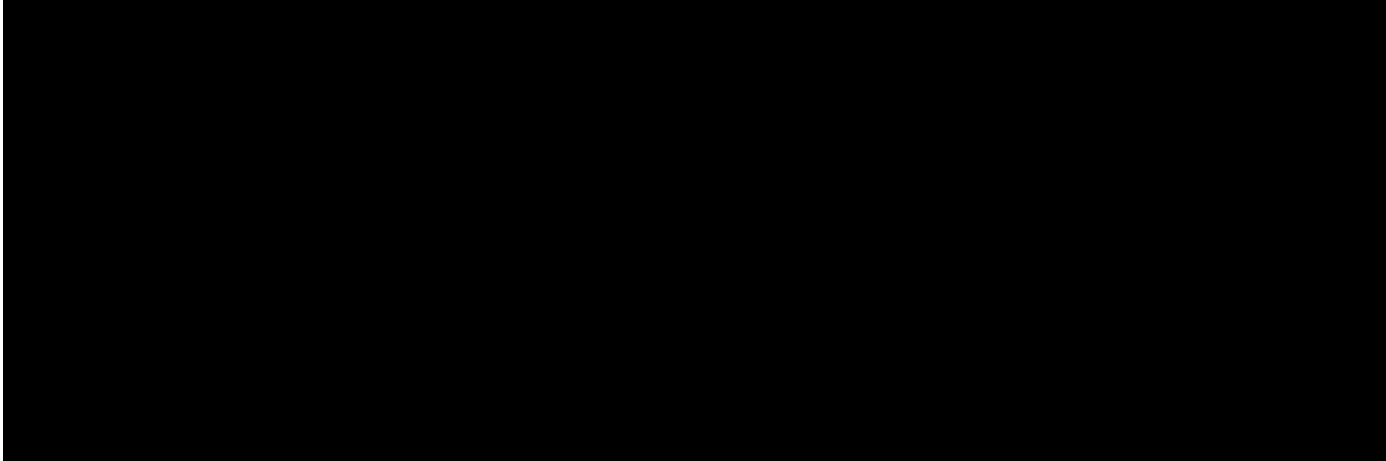
```
E1 - OSPF external type 1, E2 - OSPF external type 2
```

```
E2 100.0.0.0/24 [1/20] via 192.88.88.126, FastEthernet 1/0
```

```
C 192.88.88.0/24 [1] is directly connected, FastEthernet 1/0, Area 0.0.0.1
```

```
show ip ospf route
```

codes	
100.0.0.0/24	



Summary Address	
Summary Mask	
Advertise	
Status	
Aggregated subnets	

33.2.8 show ip ospf virtual-link

```

OSPF
virtual-link
show ip ospf [process-id] virtual-link

```


show ip ospf neighbor

show ip ospf virtual-links

```

Ruijie# show ip ospf virtual-links
Virtual Link VLINK0 to router 1.1.1.1 is up
Transit area 0.0.0.1 via interface FastEthernet 0/1
Local address 10.0.0.37/32
Remote address 10.0.0.27/32
Transmit Delay is 1 sec, State Point-To-Point,

```

```
Timer intervals configured, Hello 10, Dead 40, Wait 40,  
Retransmit 5  
Hello due in 00:00:05
```

34 BGP


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

show ip bgp	BGP
bgp bestpath med confed	AS MED
bgp bestpath med missing-as-worst	MED
bgp deterministic-med	AS

34.1.5 bgp bestpath as-path ignore

```

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

AS

BGP

(RFC1771) BGP AS
AS
AS
AS

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

show ip bgp	BGP

34.1.6 bgp bestpath compare-confed-aspash

```

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

```

                                ebgp peer
                                ASPATH
    
```

BGP

```

                                Ebgp peer
                                ASPATH
                                ASPATH
    
```

```

                                ASPATH
                                ASPATH
    
```

```

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

show ip bgp	BGP
bgp router-id	BGP Router ID

34.1.7 bgp bestpath compare-routerid

```

                                router ID
                                no
                                bgp bestpath compare-routerid
                                no bgp bestpath compare-routerid
    
```

BGP

AS

MED

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

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

show ip bgp	BGP
bgp bestpath always-compare-med	AS MED
bgp bestpath med confed	AS MED
bgp deterministic-med	AS

34.1.10 bgp client-to-client reflection

no

bgp client-to-client reflection

no bgp client-to-client reflection

BGP

no bgp client-to-client

reflection

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# no bgp client-to-client
reflection
```

bgp cluster-id	
neighbor route-reflector-client	



34.1.11 **bgp cluster-id**

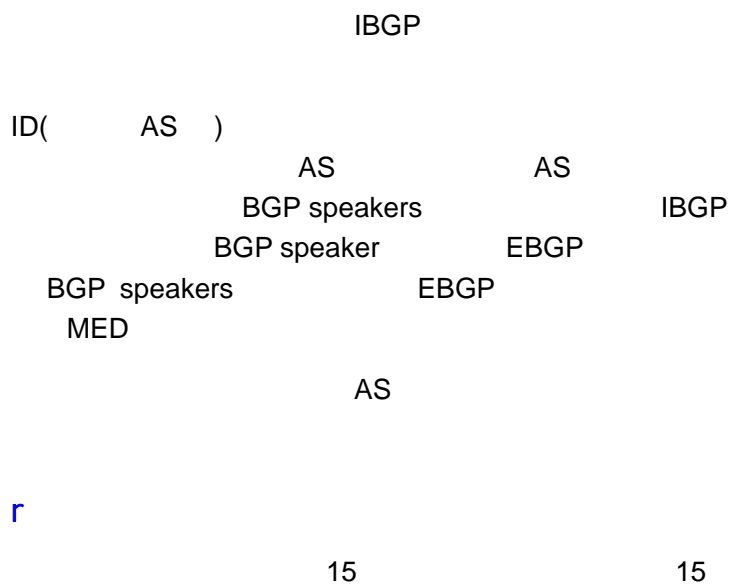
no

bgp cluster-id *cluster-id*

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

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

BGP



r

```
Ruijie(config-router)# bgp confederation peers 65000
65100
```

bgp confederation identifier	

34.1.14 bgp default ipv4-unicast

address family IPv4

ipv4-unicast

BGP

BGP address family ipv4

Ruijie(config-router)# **bgp default ipv4-unicast**

address-family ipv4	IPv4

34.1.15 bgp default local-preference

local-preference no

bgp default local-preference *value*

no bgp default local-preference

<i>value</i>	0..4294967295

100

BGP

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
```

confed	MED
bgp bestpath med missing-as-worst	MED

34.1.17 bgp enforce-first-as

UPDATE

AS_PATH AS
UPDATEC

EBGP

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

router bgp	BGP

34.1.19 bgp log-neighbor-changes

```

no debug BGP
no
bgp log-neighbor-changes
no bgp log-neighbor-changes

```

BGP

```

debug BGP
debug BGP

```

```
Ruijie(config-router)# bgp log-neighbor-changes
```

router bgp	BGP

34.1.20 bgp router-id

```

no BGP ID—IP
no IP
bgp router-id ip-address
no bgp router-id ip-address

```

<i>ip-address</i>	IP

route-id

BGP

BGP

ID—IP

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



soft	
soft in	
soft out	

r

BGP router

BGP

BGP

BGP

BGP

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

show ip bgp neighbors BGP

neighbor soft-reconfiguration inbound

Ruijie# **clear bgp ipv4 unicast ***

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

34.1.22 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	
bgp dampening	

EBGP

clear bgp ipv4 unicast external [[s] [in | out]] o

f

in	soft

out	soft	BGP speaker
soft		
soft in		
soft out		

BGP

```
Ruijie# clear bgp ipv4 unicast external in
```

clear ip bgp	BGP
show ip bgp neighbors	BGP

34.1.24 clear bgp ipv4 unicast flap-statistics

```
clear bgp ipv4 unicast flap-statistics [address [mask]]
```

<i>address</i>	IP
<i>mask</i>	


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

BGP router

BGP

BGP

BGP

BGP

peer

neighbor

soft-reconfiguration inbound
speaker

BGP

BGP

show ip bgp neighbors

BGP

BGP
BGP

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

show ip bgp dampening dampened-paths	
bgp dampening	

34.1.28 clear ip bgp external

EBGP

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

ipv4 unicast	ipv4
in	soft

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#

<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

34.1.32 default-information originate

no

[no] default-information originate

no

BGP

network
originate IGP

default-information
network

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

network	
redistribute	

34.1.33 default-metric

BGP **metric**

no

default-metric *number*

no default-metric

<i>number</i>	metric	1.. 4294967295

no default-metric

BGP

BGP **metric**

metric

```

r
metric redistribute metric
metric
default-metric connected metric
0
    
```

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

redistribute	

34.1.34 distance bgp

BGP **no**

```

distance bgp external-distance internal-distance local-distance
no distance bgp [external-distance internal-distance local-distance]
    
```

<i>external-distance</i>	EBGP peers 1..255
<i>internal-distance</i>	IBGP peers 1..255
<i>local-distance</i>	peers IGP 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
```

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

34.1.35 exit-address-family

```

BGP address-family
exit-address-family

```

```

BGP address-family

```

```

bgp address-family bgp

```

```

Ruijie(config-router-af)# exit-address-family

```

address-family ipv4	address-family ipv4

34.1.36 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

IP

```
Ruijie(config)# ip as-path access-list 1 deny ^123$
```

neighbor filter-list	as-path
neighbor distribute-list	

34.1.37 neighbor activate

no

```
neighbor {peer-address | peer-group-name} activate
```

```
no neighbor {peer-address | peer-group-name} activate
```

peer-address	IPv4
peer-group-name	32

ipv4

```
BGP          BGP  IPv4
```

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

34.1.38 neighbor advertisement-interval

BGP

no

neighbor {*peer-address* | *peer-group-name*} **advertisement-interval**
seconds

no neighbor {*peer-address* | *peer-group-name*} **advertisement-interval**
seconds

<i>peer-address</i>	
<i>peer-group-name</i>	32
<i>seconds</i>	: 1..600

IBGP : 15seconds

EBGP : 30seconds

BGP

BGP

```
Ruijie(config)# router bgp 60
Ruijie(config-router)# neighbor 10.0.0.1 remote-as 100
Ruijie(config-router)# neighbor 10.0.0.1
advertisement-interval 10
```



router bgp

BGP

router bgp	BGP
neighbor remote-as	BGP

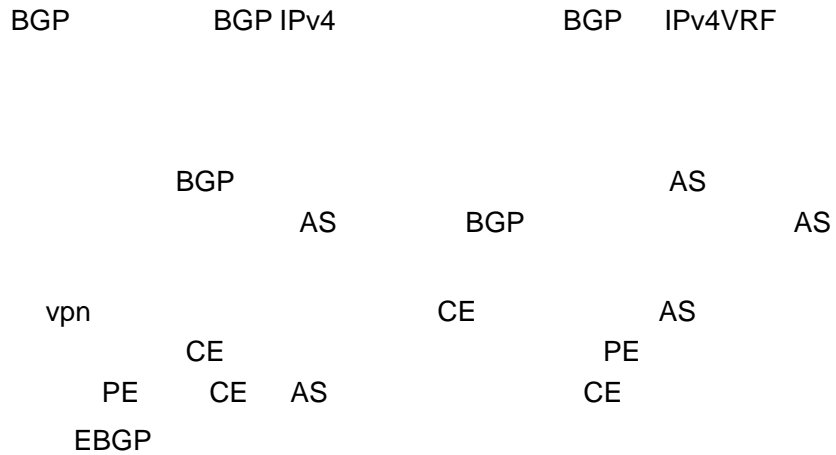
34.1.40 neighbor as-override

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



```
Ruijie(config)# router bgp 60
Ruijie(config-router)# neighbor 10.0.0.1 remote-as 100
Ruijie(config-router)# address-family ipv4 vrf vpn1
Ruijie(config-router-af)# neighbor 10.0.0.1
as-override
```

router bgp	BGP
neighbor remote-as	BGP

34.1.41 neighbor default-originate

BGP speaker () no

neighbor {*peer-address* | *peer-group-name*} **default-originate**
 [**route-map** *map-tag*]
no neighbor {*peer-address* | *peer-group-name*} **default-originate**
 [**route-map** *map-tag*]

<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 60
Ruijie(config-router)# neighbor 10.1.1.1 remote-as 80
Ruijie(config-router)# neighbor 10.1.1.1
default-originate
```

router bgp	BGP
neighbor remote-as	BGP

router bgp	BGP
neighbor remote-as	BGP
ip access-list	IP ACL IP ACL

34.1.44 neighbor ebgp-multihop

```

                                EBGp          BGP
no
neighbor {peer-address | peer-group-name} ebgp-multihop [ttl]
no neighbor {peer-address | peer-group-name} ebgp-multihop

```

<i>peer-address</i>	IPv4
<i>peer-group-name</i>	32
<i>ttl</i>	1..255

```

                                EBGp          BGP
                                ebgp-multihop          ttl          255

```

```
Ruijie(config-router)# neighbor 10.0.0.1 ebgp-multihop
```

router bgp	BGP
neighbor remote-as	BGP

34.1.45 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}
```

```
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

34.1.46 neighbor maximum-prefix

BGP

no

neighbor

BGP BGP IPv4 BGP IPv6
 BGP IPv4 VRF

BGP
 warning-only

BGP

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# neighbor 10.0.0.1
maximum-prefix 1000
```

router bgp	BGP
neighbor remote-as	BGP

34.1.47 neighbor next-hop-self

BGP
 BGP speaker **no**

neighbor {*peer-address* | *peer-group-name*} **next-hop-self**

no neighbor {*peer-address* | *peer-group-name*} **next-hop-self**

<i>peer-address</i>	IPv6 IPv4
<i>peer-group-name</i>	32

BGP BGP IPv4 BGP IPv6
 BGP IPv4 VRF

(Frame Relay X.25)

BGP speakers

BGP

```
Ruijie(config)# router bgp 65000  
Ruijie(config-router)# neighbor 10.0.0.1 next-hop-self
```



BGP BGP IPv4 BGP IPv6
 BGP IPv4 VRF

TCP MD5 BGP BGP
 BGP speaker

BGP BGP

BGP

password

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# neighbor 10.0.0.1 password
Red-Giant
```

router bgp	BGP
neighbor remote-as	BGP

34.1.49 neighbor peer-group (assigning members)

no BGP BGP
 BGP

neighbor *peer-address* **peer-group** *peer-group-name*

no neighbor *peer-address* **peer-group** *peer-group-name*

<i>peer-address</i>	IPv6 IPv4
<i>peer-group-name</i>	32

BGP

```

remote-as update-source local-as reconnect-interval times
advertisemet-interval default-originate next-hop-self remove-p
rivate-as send-community distribute-list out filter-list out p
refix-list out route-map out unsuppress-map route-reflector-c
lient

```

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

34.1.50 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

34.1.51 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

peer-group-name

BGP () no
 ()
neighbor {*peer-address* | *peer-group-name*} **remote-as** *as-number*
no neighbor {*peer-address* | *peer-group-name*} **remote-as** *as-number*

<i>peer-address</i>	IPv4 IPv6
<i>peer-group-name</i>	32
<i>as-number</i>	BGP () 1..65535

BGP

BGP BGP IPv4 BGP IPv4 VRF

BGP

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# neighbor 10.0.0.1 remote-as 80
```

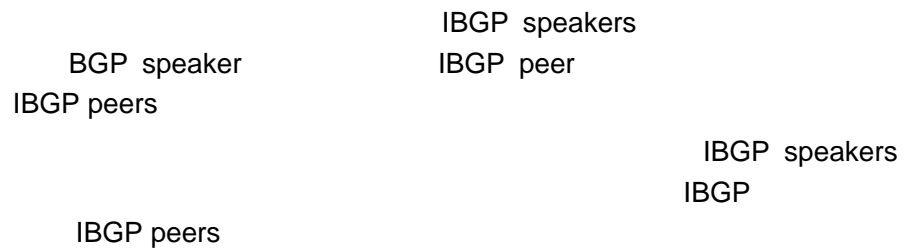
router bgp	BGP

34.1.53 neighbor remove-private-as

AS EBGP AS
 AS no
neighbor {*peer-address* | *peer-group-name*} **remove-private-as**
no neighbor {*peer-address* | *peer-group-name*} **remove-private-as**

<i>ip-address</i>	
<i>peer-group-name</i>	32

BGP



```

Ruijie(config)# router bgp 65000
Ruijie(config-router)# neighbor 10.0.0.1
route-reflector-client

```

router bgp	BGP
neighbor remote-as	BGP
bgp cluster-id	ID
bgp client-to-client reflection	

34.1.56 neighbor send-community

BGP **no**

```

neighbor {peer-address | peer-group-name} send-community
[both|standard|extended]
no neighbor {peer-address | peer-group-name} send-community
[both|standard|extended]

```


<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

34.1.59 neighbor soo

, no

```
neighbor [peer-address | peer-group-name] soo soo-value
no neighbor [peer-address | peer-group-name] soo
```


<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</i> <i>holdtime</i>

34.1.61 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

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

34.1.64 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

32768

BGP

route-map set weight

Ruijie(config-router)# **neighbor 10.1.1.1 weight 73**

router bgp	BGP
neighbor remote-as	BGP

34.1.65 network(BGP)

BGP speaker

no

network *network-number* **mask** *mask* [**route-map** *map-tag*]
[backdoor]

no network *network-number* **mask** *mask* [**route-map**] [**backdoor**]

<i>network-number</i>	
<i>mask</i>	
<i>map-tag</i>	route-map route map 32
backdoor	

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

34.1.66 network synchronization

BGP speaker
no

network
network

network synchronization
no network synchronization

BGP

network

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# network synchronization
```



router bgp

r
route-map metric route-map route-map
route-map metric route-map metric

```
ospf match
```

```
external [1|2]
```

```
OSPF external
```

```
1 2
```

```
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100
```

```
2 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100
```

show ip protocols	

34.1.69 router 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

34.1.70 synchronization

BGP IGP no
BGP IGP

synchronization

no synchronization

BGP

BGP IGP

BGP Fw Í1 '4~,Q•AíÑ~@çÁ £K±...4 ~A'€ Ä ðÂlèfð gÂY ') 1Q , ðA Uð ñÀ b>^2 • `9w iíí`

```
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
```

34.2.2 show ip bgp cidr-only

```
show ip bgp cidr-only
```

"

<i>community-number</i>	AA:NN(/2) internet no-export local-as no-advertise
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
```

34.2.4 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

```

ip community-list	

34.2.5 show ip bgp dampening dampened-paths

```
show ip bgp dampening dampened-paths
```

```

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 ?

```

34.2.6 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 ?

```

34.2.7 show ip bgp dampening parameters

BGP

show ip bgp dampening parameters

BGP

```

Ruijie (config-router)# bgp dampening 25 10000 10000 200
Ruijie# show ip bgp dampening parameters
dampening 25 10000 10000 200
Dampening Control Block(s):
Reachability Half-Life time      : 25 min
Reuse penalty                     : 10000
Suppress penalty                  : 10000
Max suppress time                 : 200 min
Max penalty (ceil)               : 29800000
Min penalty (floor)              : 5000

```

34.2.8 show ip bgp filter-list

show ip bgp filter-list *path-list-number*

<i>path-list-number</i>	

```
Ruijie(config)# ip as-path access-list 5 permit .*
Ruijie# show ip bgp filter-list 5
BGP table version is 1, local router ID is 192.168.88.200
Status codes: s suppressed, d damped, h history, * valid,
> best, i - internal,
S Stale
Origin codes: i - IGP, e - EGP, ? - incomplete
Network      Next Hop      Metric LocPrf Weight Path
*> 192.168.88.0      0.0.0.0      32768 ?
Total number of prefixes 1
```

34.2.9 show ip bgp inconsistent-as

AS

show ip bgp inconsistent-as

AS

```
Ruijie# show ip bgp inconsistent-as
```

34.2.10 show ip bgp neighbors

BGP

```
show ip bgp neighbors [neighbor-address] [received-routes | routes  
| advertised-routes]
```

```
Local host : 12.12.12.1 Local port : 179
Remote host : 12.12.12.2 Remote port : 1067
Maximum-Prefix limit : 4294967295
Threshold for warning : 0%
Accepted prefixes : 0
Prefix advertised : 6
Received messages : 110
Sent messages : 116
Received notifications : 0
Sent notifications : 0
Route refresh received : 0
Route refresh sent : 0
```

```
Ruijie# show ip bgp neighbors 15.15.15.5 routes
Status codes: s suppressed, d damped, h history, * valid,
> best, i - internal
Origin codes: i - IGP, e - EGP, ? - incomplete
Status Network          Next Hop          Metric  LocPrf
Path
-----
*>i 58.1.1.0/24          58.58.58.8          58
100 800 ?
*>i 58.1.2.0/24          58.58.58.8          58
100 800 ?
*>i 58.1.3.0/24          58.58.58.8          58
100 800 ?
*>i 58.1.4.0/24          58.58.58.8          58
100 800 ?
*>i 58.1.5.0/24          58.58.58.8          58
100 800 ?
*>i 58.1.6.0/24          58.58.58.8          58
100 800 ?
*>i 58.1.7.0/24          58.58.58.8          58
100 800 ?
*>i 58.1.8.0/24          58.58.58.8          58
100 800 ?
*>i 58.1.9.0/24          58.58.58.8          58
100 800 ?
*>i 58.1.10.0/24         58.58.58.8          58
100 800 ?
*>i 67.1.1.0/24          67.67.67.7          67
100 700 ?
*>i 67.1.2.0/24          67.67.67.7          67
100 700 ?
*>i 67.1.3.0/24          67.67.67.7          67
100 700 ?
```

```

*>i      67.1.4.0/24          67.67.67.7          67
100 700 ?
*>i      67.1.5.0/24          67.67.67.7          67
100 700 ?
*>i      67.1.6.0/24          67.67.67.7          67
100 700 ?

```

34.2.11 show ip bgp paths

show ip bgp paths

```
Ruijie# show ip bgp paths
```

34.2.12 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

```

34.2.13 show ip bgp regexp

AS

BGP

```
show ip bgp regexp regexp
```

<i>regexp</i>	AS

AS

BGP

```

Ruijie# show ip bgp regexp _300_
Status codes: s suppressed, d damped, h history, * valid,
> best, i - internal
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

```

34.2.14 show ip bgp summary

BGP

show ip bgp summary

BGP

```

Ruijie # show ip bgp summary
BGP router identifier 192.168.88.200, local AS number
500
BGP table version is 1
1 BGP AS-PATH entries
0 BGP community entries
Neighbor      V    AS  MsgRcvd  MsgSent   TblVer  InQ
OutQ Up/Down  State/PfxRcd
1.1.1.1      4    200      0        0         0    0    0
never Active
Total number of neighbors 1

```

router bgp	BGP

34.2.15 show ip bgp vpnv4

show ip bgp vpn4 vrf *vrf_name* [*network* | **summary** | **label**]

show ip bgp vpn4 rd *rd_value* [*network* | **neighbor** [| **address**] | **summary** | **label**]

<i>network</i>	

```
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
```

MPLS BGP

show ip community-list [*community-list-number*]

35

35.1

35.1.1 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 *prefix-list-name*

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	

35.1.2 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>	()

OSPF
OSPF

RIP

192.168.12.0/24

```
router rip
network 200.4.4.0
network 192.168.12.0
distribute-list 10 out
version 2
access-list 10 permit 192.168.12.0
```

access-list	
prefix-list	
redistribute	

35.1.3 ip community-list

no

ip community-list {[**standard** | **expanded**] *community-list-name* | *community-number*} {**permit** | **deny**} [*community-number*]

no ip community-list {**standard** | **expanded**} {*community-list-name* | *community-number*}

<i>community-list-name</i>	32
standard	1..99
expanded	100
permit	
deny	
<i>community-number</i>	AA:NN(/2)

internet Internet

no-export EBGP

peers

no-advertise

BGP peers

local-as

AS

1..255

<i>network</i>	

0.0.0.0/0

default-network

connected

192.168.100.0

```
ip route 192.168.100.0 255.255.255.0 serial 0/1
ip default-network 192.168.100.0
```

200.200.200.0

200.200.200.0

```
ip default-network 200.200.200.0
```

show ip route	IP

35.1.5 ip prefix-list

ip prefix-list

no

```
ip prefix-list prefix-lis-name [ seq seq-number ] { deny | permit }
ip-prefix [ge minimum-prefix-length][ le maximum-prefix-length]
no ip prefix-list prefix-lis-name [ seq seq-number ] { deny | permit }
ip-prefix [ge minimum-prefix-length][ le maximum-prefix-length]
```

<i>prefix-list-name</i>	
<i>seq-number</i>	1 2147483647 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

```

```

                                OSPF          RIP
                                IP            IP
                                (            )
                                IP  201.1.1.0/24
                                )

```

```

Ruijie# configure terminal
Ruijie(config)# ip prefix-list pre1 permit 201.1.1.0/24
Ruijie(config)# router ospf
Ruijie(config-router)# distribute-list prefix pre1 out
rip
Ruijie(config-router)# end

```

35.1.6 ip prefix-list description

```

                                ip prefix-list description
                                no
ip prefix-list prefix-lis-name description descripton-text

```

<i>prefix-lis-name</i>	
<i>descripton-text</i>	

```

                                OSPF          RIP
                                IP            IP
                                (            )
                                IP  201.1.1.0/24
                                )

```

```

Ruijie# configure terminal
Ruijie(config)# ip prefix-list pre description Deny
routes from Net-A

```

35.1.7 ip prefix-list sequence-number

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
```

35.1.8 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

route 0.0.0.0 0.0.0.0 Fastethernet 0/0 ip
Fastethernet 0/0
ARP CPU "

```

show ip route	IP

35.1.9 ip routing

```

no          RGOS      IP

```

ip routing

no ip routing

IP

```

          RGOS      IP          VOIP
          RGOS      IP          RGOS      IP

          RGOS      IP
no ip routing

```

35.1.10 ip static route-limit

```

          ip static route-limit
no
ip static route-limit number
ip static route-limit number

```

<i>number</i>	1-10000

1000

ip static

route-limit

show running config

900

ip static route-limit 900

35.1.11 ipv6 prefix-list

IPv6

ipv6

prefix-list

no

ipv6 prefix-list *prefix-lis-name* [**seq** *seq-number*] { **deny** | **permit** }

ipv6-prefix [**ge** *minimum-prefix-length*][**le** *maximum-prefix-length*]

no ipv6 prefix-list *prefix-lis-name*[**seq** *seq-number*] { **deny** | **permit** }

ipv6-prefix [**ge** *minimum-prefix-length*][**le** *maximum-prefix-length*]

<i>prefix-lis-name</i>	
<i>seq-number</i>	1 2147483647 5 5
deny	
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
ipv6-prefix 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

```

35.1.12 ipv6 prefix-list description

```

IPv6 ipv6 prefix-list
description no
ipv6 prefix-list

```

<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

```

35.1.13 ipv6 prefix-list sequence-number

```

                                IPv6          ipv6 prefix-list description
                                no
                                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

```

35.1.14 match as-path

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 r</i>	100...199
<i>community-list-name</i>	80
exact-match	

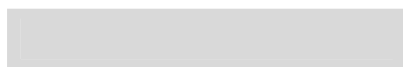
match community

6

exact-match

set **match** 1 **match** 1 **set**

```
ip community-list 1 permit 100:2 100:30
route-map set_lopref
match community 1 exact-match
set local-preference 20
```



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

35.1.16 match interface

match

interface **no**

match interface *interface-type interface-number [...interface-type interface-number]*

no match interface *interface-type interface-number [...interface-type interface-number]*

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

match interface

OSPF

RIP

RIP

OSPF

route maps

1

match

1

set

match

set

OSPF RIP
fastethernet 0/0 RIP

```
router ospf
redistribute rip subnets route-map redrip
network 192.168.12.0 0.0.0.255 area 0
```

```
route-map redrip permit 10
match interface fastethernet 0/0
```

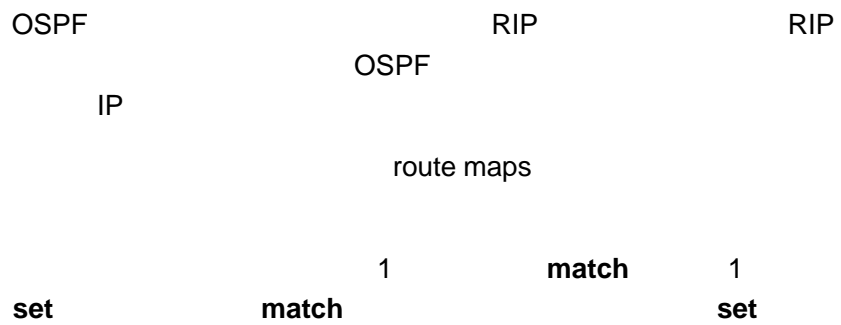
match ip address	
match ip next-hop	
match ip route-source	

match metric

match metricmap retyp3()TJ /C2_0 1

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

match ip address



```

10 OSPF
type-1 RIP OSPF
40 OSPF
RIP
  
```

```

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	

35.1.18 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

35.1.19 match ip route-source

```
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
```

.994

set metric-type	
set tag	

35.1.21 match ipv6 next-hop

IPv6

match ipv6 address **no**

match ipv6 next-hop { *access-list-name* | **prefix-list** *prefix-list-name* }

no match ipv6 next-hop

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

OSPF

RIP

RIP

OSPF

IP

route maps

set

match

1

match

1

set

```

                                OSPF
                                RIP
                                OSPF
                                RIP
10  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

```

ipv6 access-list	IPv6
match interface	
match ipv6 address	IPv6
match ipv6 route-source	IPv6
match metric	
match route-type	
match tag	
set metric	
set metric-type	
set tag	

35.1.22 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
--	------

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

ÑtV°• Ý •R Õ%) ÑRÙ"ViÕ%€m W!HR 1ð

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

35.1.23 match length

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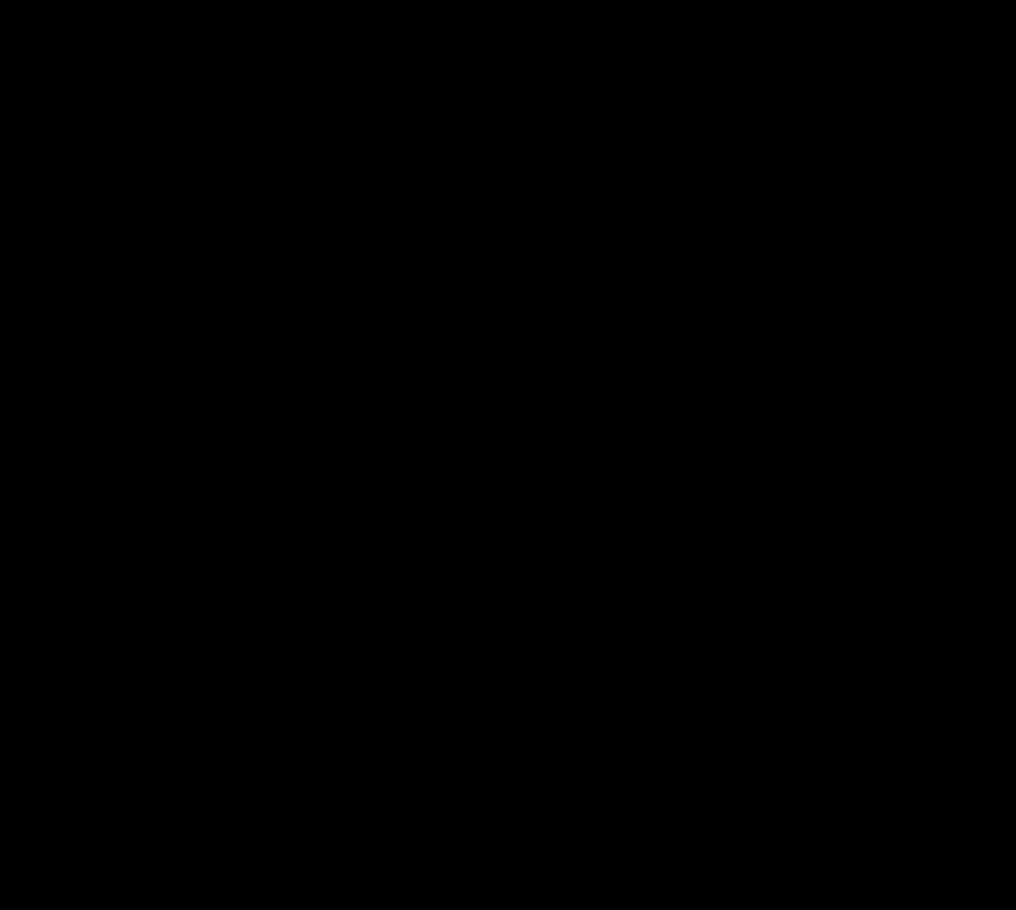
serial 1/0
fastethernet 1/0

500

```
interface fastethernet 1/0
ip policy route-map smallpak

route-map smallpak permit 10
match length 0 500
set interface fastethernet 0/0
```

route-map	
match ip address	
set default interface	
set interface	
set ip default next-hop	IP
set ip next-hop	IP
set ip precedence	IP



RIP

RIP

ps

match

**1
set**

10

```
router ospf
redistribute rip subnets route-map redist-rip
network 192.168.12.0 0.0.0.255 area 0
```

```
route-map redist-rip permit 10
match metric 10
```

access-list	

match ip address

match

origin no

match origin {egp | igp | incomplete}

no match origin {egp | igp | incomplete}

35.1.26 match route-type

```
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	

35.1.27 match tag

match tag **no**

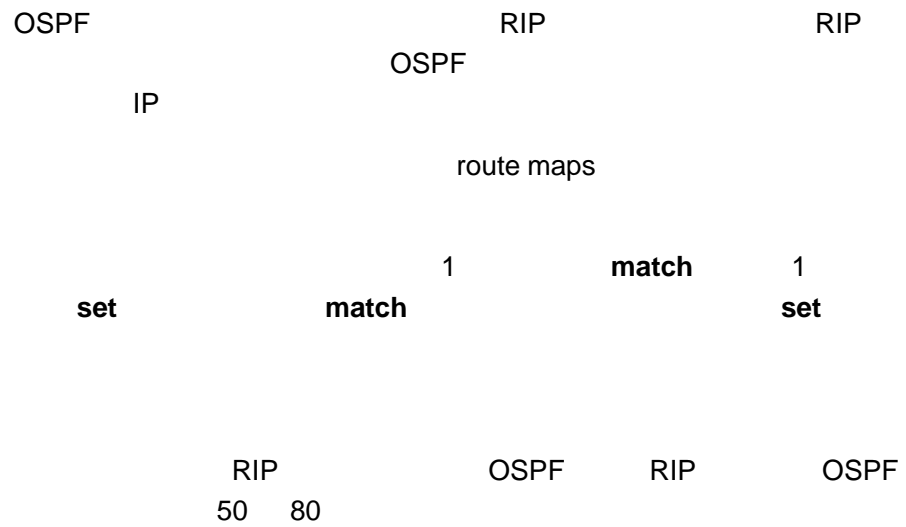
```
match tag tag [...tag]
```

```
no match tag tag [...tag]
```

<i>tag</i>	

match tag

tag



```

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	

permit

2

PBR Policy-Based Routing

IP

IP

IP

matchmatch

match

<i>as-number</i>	AS
<i>ip_addr</i>	

BGP

as,ip-addr

```
route-map set-as-path
match as-path 1
set aggregator as 3 2.2.2.2
```

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

35.1.31 set as-path prepend

match	AS_PATH
set as-path prepend	no

```
set as-path prepend as-number
no set as-path prepend [as-number]
```

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

```

router bgp 100
neighbor 172.16.233.33 remote-as 120
neighbor 172.16.233.33 route-map ROUTEMAPIN in
neighbor 172.16.233.33 route-map ROUTEMAPOUT out

```

```

ip community-list 500 permit 100:10
ip community-list 500 permit 100:20

```

```

ip community-list 120 deny 100:50
ip community-list 120 permit 100:.*

```

```

route-map ROUTEMAPIN permit 10
set comm-list 500 delete

```

```

route-map ROUTEMAPOUT permit 10
set comm-list 120 delete

```

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

35.1.33 set community

match

COMMUNITY

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

35.1.34 set dampening

match **no** **set**
dampening

set dampening *half-life reuse suppress max-suppress-time*
no set dampening

<i>half-life</i>	1..45()	15
<i>reuse</i>	1..20000	750
<i>suppress</i>	1..20000	2000
<i>max-suppress-time</i>	1..255()	4* half-life

```
route-map tag
match as path 10
set dampening 30 1500 10000 120
```

```
router bgp 100
neighbor 172.16.233.52 route-map tag in
```

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

35.1.35 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>	

U6W Û ° 0P3&C0 Û~'#Ã+U6WA1ÀAÓT ¥ K•Ð À ',X

```

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	

35.1.36 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>	

```
route-map equal-access permit 30
set default interface null0
```

route-map	
match ip address	
set default interface	
set default interface	
set interface	
set ip next-hop	IP
set ip precedence	IP

set default interface	
set default interface	
set interface	
set ip default next-hop	IP
set ip precedence	IP

35.1.38 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 7700CFC>Tj/TT0 1 Tf25[T0 1j/TT20E720874>1D1747 1 T

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

```

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

35.1.40 set ip precedence

```

match IP ,
set ip precedence no

```

set ip precedence {<0-7> | *critical* | *flash* | *flash-override* | *immediate* | *internet* | *network* | *priority* | *routine* }

no set ip precedence {<0-7> | *critical* | *flash* | *flash-override* | *immediate* }

```

IP          TOS          IP
          IP          TOS

          fastEthernet 0/0
192.168.217.68  tos  4

access-list 1 permit 192.168.217.68 0.0.0.0
route-map name
match ip address 1
set ip tos 4
interface fa 0/0
ip policy route-map name

```

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

35.1.42 set level

```

match
set level      no

set level {level 1 | level 2 | level 1-2 | stub-area | backbone}
no set level

```

OSPF

RIP

backbone

```
router ospf
redistribute rip subnets route-map redrip
network 192.168.12.0 0.0.0.255 area 0
```

```
route-map redrip permit 10
set level backbone
```

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

35.1.43 set local-preference

match

LOCAL_PREFERENCE

<i>number</i>	0..4294967295
---------------	---------------

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
```

+	metric
-	metric

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

35.1.45 set metric-type

```

match
set metric-type no
set metric-type type
no set metric-type

```

<i>type</i>	

```

OSPF type-2

```

```

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

```

OSPF
type-1

RIP

```
router ospf
redistribute rip subnets route-map redrip
network 192.168.12.0 0.0.0.255 area 0
0 -1.446 TD route-map redrippermit0 lp typ (typelp )Tj0Gf021 wl 1M(
```

```

      OSPF                                RIP                                RIP
      IP                                  OSPF
      route maps
      1      match      1
      set      match      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	
match ip route-source	
match metric	
match route-type	
match tag	
set metric-type	
set tag	

35.1.47 set origin

```

      match
      set origin      no
      set origin {egp | igp | incomplete}

```

no set origin

egp	EGP
igp	IGP
Incomplete	

```
route-map SET_ORIGIN 10 permit
match as-path 1
set origin igp
route-map SET_ORIGIN 20 permit
match as-path 2
set origin egp
```

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

35.1.48 set originator-id

```

match
set originator-id          no
set originator-id ip-addr
no originator-id [ip-addr]

```

<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	

35.1.49 set tag

```

match                               set tag
no

```



35.1.50 set weight

match

set community	COMMUNITY
set metric	
set metric-type	

35.1.51 ip ref ecmp load-balance source

ECMP/WCMP

HASH(KEY(SIP,[DIP] [TCP/UDP Port] [UDF]))

Hash

```

HASH                2                CRC32_Upper
CRC32_Lower         KEY
KEY                IP                (SIP)
TCP/UDP            IP(DIP)
KEY
```

ip ref ecmp load-balance

```

{[crc32_lower | crc32_upper] [dip] [port]
[udf number]}
```

no ip ref ecmp load-balance

```

{[crc32_lower | crc32_upper] [dip] [port]
[udf number]}
```

```

DIP Port UDF Key
CRC32_Lower CRC32_Upper Hash
no
Key
SIP + DIP + Port no ip ref ecmp route dip port
Key SIP no
```

hash

```
Ruijie(config)# ip ref ecmp load-balance crc32_upper
```

```
ip( ), ip,udp/tc
```

```
Ruijie(config)# ip ref ecmp load-balance dip port
```

35.2

35.2.1 show route-map

show route-map

show route-map *route-map-name*

<i>route-map-name</i>	

show ip community-list [*community-list-number*|*community-list-name*]

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

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
E2	E1 OSPF E2 OSPF N1 OSPF NSSA 1 N2 OSPF NSSA 2 IA OSPF su IS-IS L1 IS-IS 1 L2 IS-IS 2 ia IS-IS

20.0.0.0/8	
[1/0]	
Via 20.0.0.1	IP
00:00:06	IP

prefix-name	IPv6
-------------	------

IPv6

```
Ruijie# show ipv6 prefix-list
ipv6 prefix-list p6: 2 entries
permit 13::/20
permit 14::/20
```

35.2.6 show ip ref

REF

REF

```
Ruijie# show ip ref
-----statistic information-----:
current    routes: 5
alloc weight_nodes: 5
alloc bal_tables: 0
alloc adj_nodes: 5
alloc res_adj: 0
-----:
```

--	--

routes	REF
weight_nodes	
bal_tables	
adj_nodes	
res_adj	

36

36.1

36.1.1 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 interface	
set default interface	
set ip tos	IP TOS
set ip dscp	IP DSCP
set ip precedence	IP
match ip address	

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

next-hop,

EF0

next-hop

```
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
```

37 IPv6

37.1

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 dad attempts
- ' ipv6 nd suppress-ra
- ' ipv6 redirects
- ' clear ipv6 neighbors
- ' tunnel mode ipv6ip
- ' tunnel destination
- ' tunnel source
- ' tunnel ttl

37.1.1 ping ipv6

IPV6

ping ipv6 [*ipv6-address*]*ipv6-address*

ping

!	
.	
U	
R	
F	
A	

```

r
S57 [128,128] IPv6 [0,64]
[128,128] [0,64]

```

```

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

```

37.1.3 ipv6 enable

```

IPV6 no IPV6

```

ipv6 enable

no ipv6 enable

```

IPV6

```

```

2 IPV6 ipv6 enable
, IPV6

```

r

IPv6 IPv6

no ipv6 enable IPV6

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

show ipv6 interface	

37.1.4 ipv6 hop-limit

ipv6 hop-limit value

no ipv6 hop-limit

64

```
Ruijie(config)# ipv6 hop-limit 100
```

37.1.5 ipv6 neighbor

no

ipv6 neighbor *ipv6-address interface-id hardware-address*

no ipv6 neighbor *ipv6-address interface-id*

ipv6-address

IPV6

RFC2373

<i>interface-id</i>	Routed Port,L3 AP
SVI	
<i>hardware-address</i>	XXXX.XXXX.XXXX
48 MAC 'X'	

0

IPv6

0

IPv6

```
Ruijie(config)# no ipv6 source-route
```

37.1.7 ipv6 route

IPV6

no

```
ipv6 route ipv6-prefix/prefix-length {ipv6-address | interface-id [ipv6-address]}
```

```
no ipv6 route ipv6-prefix/prefix-length {ipv6-address | interface-id [ipv6-address]}
```

```
ipv6-prefix IPV6 RFC2373  
prefix-length IPV6 ''
```

r

```
S57 [128,128] [0,64] [0,64] [128,128]
```

```
ipv6-address RFC2373
```

```
interface-id
```

,

```
Ruijie(config)# ipv6 route 2001::/64 vlan 1 2005::1
```

show ipv6 route	IPv6

37.1.8 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
```

37.1.9 ipv6 nd ns-interval

(NS)

no

```
ipv6 nd ns-interval milliseconds
```

```
no ipv6 nd ns-interval
```

milliseconds

1000-429467295

(RA)

0()

1000ms(1)

(RA)

```
Ruijie(config-if)# ipv6 nd ns-interval 2000
```



show ipv6 interface	

37.1.11 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 '1'

valid-lifetime

preferred-lifetime

at *valid-date preferred-date*

infinite

default

no-advertise

off-link IPV6
(on-link)

on-link

no-autoconfig

address (RA) ipv6

ipv6 nd prefix default

no ipv6 nd ra-lifetime

seconds

0-9000s

1800

“ ” (RA)
 0 (RA) 0 (ra-interval)

```
Ruijie(config)# interface vlan 1
Ruijie(config-if)# ipv6 nd ra-lifetime 2000
```

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



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**

r00192710.5 180.6 435.6203 Tm

IPv6

ipv6 nd ra-lifetime	
ipv6 nd ra-interval	
ipv6 nd ra-hoplimit	

37.1.16 ipv6 nd managed-config-flag

configuration" no "managed address
ipv6 nd managed-config-flag
no ipv6 managed-config-flag

```
Ruijie(config)# int vlan 1  
Ruijie(config)# ipv6 nd managed-config-flag
```



```
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	

37.1.18 ipv6 nd suppress-ra

(RA) no
(RA)

ipv6 nd suppress-ra

no ipv6 nd suppress-ra

IPv6

ipv6 suppress-ra

```
Ruijie(config)# interface vlan 1  
Ruijie(config-if)# ipv6 nd suppress-ra
```

show ipv6 interface	ra-info

37.1.19 ipv6 redirects

```
no  
ipv6 redirects  
no ipv6 redirects
```

IPV6
ICMPv6
ICMPv6

--	--

```
Ruijie(config-if)# tunnel source vlan 1
```

tunnel source	
tunnel destination	
tunnel ttl	TTL

37.1.22 tunnel destination

```
, no
```

```
tunnel destination ipv4-address
```

```
no tunnel destination
```

```
ipv4-address , IPv4
```

```
r
(6to4 isatap)
```

```
IPv6 :
```

```
Ruijie(config)# interface tunnel 1
Ruijie(config-if)# tunnel mode ipv6ip
Ruijie(config-if)# tunnel source vlan 1
Ruijie(config-if)# tunnel destination 192.168.5.1
```



37.2.1 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
```



REACH(Reachable) —

ra-info

RA

IPv6

ND

```
Ruijie# show ipv6 interface vlan 1
Interface vlan 1 is Up, ifindex: 2001
address(es):
Mac Address: 00:00:00:00:00:01
INET6: fe80::200:ff:fe00:1 , subnet is fe80::/64
INET6: 2001::1 , subnet is 2001::/64 [TENTATIVE]
Joined group address(es):
ff01:1::1
ff02:1::1
ff02:1::2
ff02:1::1:ff00:1
MTU is 1500 bytes
ICMP error messages limited to one every 10 milliseconds
ICMP redirects are enabled
ND DAD is enabled, number of DAD attempts: 1
ND reachable time is 30000 milliseconds
ND advertised reachable time is 0 milliseconds
ND retransmit interval is 1000 milliseconds
ND advertised retransmit interval is 0 milliseconds
ND router advertisements are sent every 200
seconds<240--160>
ND router advertisements live for 1800 seconds

                                INET6: 2001::1 , subnet is 2001::/64
[TENTATIVE]                    INET6      []
```

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>
Flags: !M!O, Adv MTU: 1500
ND advertised reachable time is 0 milliseconds
ND advertised retransmit time is 0 milliseconds
ND advertised CurHopLimit is 64
Prefixes: (total: 1)
fec0:1:1:1::/64(Def,Auto,vltime: 2592000, pltime:
604800, flags: LA)
```

ra-info

RA timer is stopped (on)	

!M M	!M managed-config-flag M:
!O O	!O other-config-flag O:

ra-info (Prefix)

total	
fec0:1:1:1::/64	
Def	
Auto CFG	Auto IPV6 , CFG
!Adv	
vlttime	()
pltime	()
L !L	L on-link !L
A !A	A auto-config , !A

38 OSPFv3

38.1

38.1.1 area default-cost

```

    stub      NSSA      ABR      stub
NSSA                                     no

```

area *area-id* **default-cost** *cost*

no area *area-id* **default-cost**

<i>area-id</i>	stub NSSA IPv4
<i>cost</i>	stub NSSA 1-16777214

default-cost 1

OSPFv3

```

    Stub  NSSA  ABR

```

```

    stub  50  100

```

```

ipv6 router ospf 1
area 50 stub
area 50 default-cost 100

```

area stub	stub
show ipv6 ospf area	OSPFv3

38.1.2 area range

no

area *area-id range ipv6-prefix/prefix-length* [**advertise**|**not-advertise**]
no area *area-id range ipv6-prefix/prefix-length*

<i>area-id</i>	IPv4
<i>ipv6-prefix/prefix-length</i>	
not-advertise	

OSPFv3

ABR

OSPF

no area *area-id* ()

1

```
ipv6 router ospf 1
area 1 range 2001:abcd:1:2::/64
```

discard-route	discard OSPF
summary-prefix	

38.1.3 area stub

```

no          stub          Stub
           stub          Stub
area area-id stub [no-summary]
no area area-id stub [no-summary]
    
```

<i>area-id</i>	stub	NSSA		IPv6
<i>no-summary</i>		stub	ABR 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
mmary 3 LSA NSSA
    
```

Stub 10 ABR Stub

```

ipv6 router ospf 1
area 10 stub
area 10 stub no-summary
    
```

area default-cost	Stub NSSA
show ipv6 ospf area	OSPFv3

38.1.4 area virtual-link

no

```
'                               stub          NSSA
'                               hello-interval  dead-interval
instance
'   no area area-id          (              q
```

ipv6 ospf cost

10M

```
ipv6 router ospf 1
auto-cost reference-bandwidth 5
```

show ipv6 ospf	OSPFv3

38.1.6 clear ipv6 ospf process

OSPF

```
clear ipv6 ospf {process | process-id}
```

<i>process-id</i>	ospf <1-65535>

ospf

```
en
clear ipv6 ospf process
```

38.1.7 default-information originate

no default-information originate [**always**] [**metric** *metric*]
 [**metric-type** *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 ASBR **default-information** OSPF

redistribute ASBR **OSPF**
default-information originate

always OSPF

show ipv6 ospf database OSPF
 0.0.0.0 OSPF

show ipv6 route

default-information originate
default-metric

OSPF 1 2

1 1 2 **show ipv6 route**

1

STUB

default-information originate always

redistribute	
show ipv6 ospf	OSPFv3
show ipv6 ospf database	OSPFv3

38.1.8 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

38.1.9 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      ipv6
                 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
    
```


38.1.11 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.

60s

```
ipv6 ospf dead-interval 60
```

ipv6 ospf hello-interval	Hello
show ipv6 ospf interface	OSPFv3
instance <i>instance-id</i>	OSPFv3

38.1.12 ipv6 ospf hello-interval

OSPFv3

```
ipv6 ospf network point-to-point
```

ipv6 ospf priority	
show ipv6 ospf interface	OSPFv3
instance <i>instance-id</i>	OSPFv3

38.1.15 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

38.1.16 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
instance <i>instance-id</i>	OSPFv3

38.1.17 ipv6 ospf transmit-delay

LSA

no

`ipv6 ospf transmit-delay seconds [instance instance-id]`

`no ipv6 ospf transmit-delay [instance instance-id]`

<i>seconds</i>	LSA 1-65535()
instance <i>instance-id</i>	OSPFv3 0-255

show ipv6 ospf interface	OSPFv3

detail	

FULL

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

show ipv6 ospf	ospf

38.1.20 max-concurrent-dd

DD

max-concurrent-dd *number*
no max-concurrent-dd

<i>number</i>	1-65535

OSPFv3

```
max-concurrent-dd 4 4
DD_____
router ipv6 ospf 1
max-concurrent-dd 4
```

38.1.21 passive-interface

no

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

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

OSPFv3

hello

OSPF

VLAN1 OSPFv3

passive-interface default
no passive-interface vlan 1

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

38.1.22 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]]]]]

*protocol*

OSPFv3

```

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

38.1.24 timers spf

```

        OSPFv3          SPF
        SPF
        no          timers spf

timers spf delay holdtime
no timers spf
    
```

<i>delay</i>	SPF 0-214748364 () 5

<i>holdtime</i>	SPF 0-214748364 ()	10
-----------------	------------------------	----

```
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 , "BFD is enabled",
```

```
Ruijie# show ipv6 ospf
```

```
Routing Process "OSPFv3 (1)" with ID 1.1.1.1
Process uptime is 24 minutes
SPF schedule delay 5 secs, Hold time between SPFs 10 secs
Minimum LSA interval 5 secs, Minimum LSA arrival 1 secs
Number of incoming current DD exchange neighbors 0/5
Number of outgoing current DD exchange neighbors 0/5
Number of external LSA 0. Checksum Sum 0x0000
Number of AS-Scoped Unknown LSA 0
Number of LSA originated 11
Number of LSA received 4
Log Neighbor Adjacency Changes : Enabled
Number of areas in this router is 2
BFD is enabled
Area BACKBONE(0)
Number of interfaces in this area is 1(1)
SPF algorithm executed 4 times
Number of LSA 3. Checksum Sum 0
```



ipv6 router ospf	OSPFv3
default-information originate	
default-metric	
<i>router-id</i>	OSPFv3
timers spf	OSPFv3 SPF SPF

38.2.2 show ipv6 ospf database

OSPFv3

show ipv6 ospf [*process- id*] **database** [*lsa-type* [**adv-router** *router-id*]]

<i>process- id</i>	OSPF ,1-65535
<i>lsa-type</i>	lsa external link inter-prefix inter-router intra-prefix network router te lsa
adv-router <i>router-id</i>	router LSA

OSPFv3

```
Ruijie# show ipv6 ospf database
      OSPFv3 Router with ID (1.1.1.1) (Process 1)
      Link-LSA (Interface FastEthernet 1/0)
Link State ID  ADV Router      Age  Seq#          CkSum
Prefix
0.0.0.2        1.1.1.1          197  0x80000001   0x7cd8
0
0.0.0.5        2.2.2.2          206  0x80000001   0x8c86
0
Link-LSA (Interface Loopback 1)
```


OSPFv3

```
Ruijie# show ipv6 ospf interface
FastEthernet 1/0 is up, line protocol is up
Interface ID 2
IPv6 Prefixes
fe80::2d0:22ff:fe22:2223/64 (Link-Local Address)
OSPFv3 Process (1), Area 0.0.0.0, Instance ID 0
Router ID 1.1.1.1, Network Type BROADCAST, Cost: 1
Transmit Delay is 1 sec, State BDR, Priority 1
Designated Router (ID) 2.2.2.2
Interface Address fe80::c800:eff:fe84:1c
Backup Designated Router (ID) 1.1.1.1
Interface Address fe80::2d0:22ff:fe22:2223
Timer interval configured, Hello 10, Dead 40, Wait 40,
Retransmit 5
Hello due in 00:00:02
Neighbor Count is 1, Adjacent neighbor count is 1
Hello received 26 sent 26, DD received 5 sent 4
LS-Req received 1 sent 1, LS-Upd received 3 sent 6
LS-Ack received 6 sent 2, Discarded 0

                                BFD                                BFD
                                ,                                    enabled
```

```
Ruijie# show ipv6 ospf interface
FastEthernet 1/0 is up, line protocol is up
Interface ID 2
IPv6 Prefixes
fe80::2d0:22ff:fe22:2223/64 (Link-Local Address)
OSPFv3 Process (1), Area 0.0.0.0, Instance ID 0
Router ID 1.1.1.1, Network Type BROADCAST, Cost: 1
Transmit Delay is 1 sec, State BDR, Priority 1 BFD enabled
Designated Router (ID) 2.2.2.2
Interface Address fe80::c800:eff:fe84:1c
Backup Designated Router (ID) 1.1.1.1
Interface Address fe80::2d0:22ff:fe22:2223
Timer interval configured,Hello 10,Dead 40,Wait
40,Retransmit 5
Hello due in 00:00:02
Neighbor Count is 1, Adjacent neighbor count is 1
Hello received 26 sent 26, DD received 5 sent 4
LS-Req received 1 sent 1, LS-Upd received 3 sent 6
LS-Ack received 6 sent 2, Discarded 0
```

ipv6 router ospf	OSPFv3

```
DR is 2.2.2.2 BDR is 1.1.1.1
Options is 0x000013 (-|R|-|-|E|V6)
Dead timer due in 00:00:36
Database Summary List 0
Link State Request List 0
Link State Retransmission List 0
```

BFD

BFD session state up

```
Ruijie# show ipv6 ospf neighbor detail
```

```
Neighbor      2.2.2.2,      interface      address
fe80::c800:eff:fe84:1c
```

```
In the area 0.0.0.0 via interface FastEthernet 1/0
Neighbor priority is 1, State is Full, 6 state changes
```

```
DR is 2.2.2.2 BDR is 1.1.1.1
Options is 0x000013 (-|R|-|-|E|V6)
Dead timer due in 00:00:36
Database Summary List 0
Link State Request List 0
Link State Retransmission List 0
```

BFD session state up

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

38.2.5 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
```

Q,

QSPI50.topolog)-7(y)7

```

Router ID      Bits Metric      Next-Hop
Interface
1.1.1.1        EB  --
2.2.2.2        E  1          2.2.2.2
FastEthernet 1/0
    
```

```

OSPFv3 paths to Area (0.0.0.1) routers
Router ID      Bits Metric      Next-Hop
Interface
1.1.1.1        B  --
    
```

ipv6 router ospf	OSPFv3
area range	OSPF

38.2.7 show ipv6 ospf virtual-links

OSPFv3

show ipv6 ospf [*process-id*] virtual-links

<i>process-id</i>	OSPFv3 ,1-65535

OSPFv3

```

Ruijie# show ipv6 ospf virtual-links
Virtual Link VLINK1 to router 2.2.2.2 is down
Transit area 0.0.0.1 via interface FastEthernet 1/0,
instance ID 0
Local address *
Remote address 3333::1/128
Transmit Delay is 1 sec, State Down,
Timer intervals configured, Hello 10, Dead 40, Wait 40,
Retransmit 5
Hello due in inactive
Adjacency state Down
    
```


39 IGMP

39.1 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-response-time
' ip igmp query-timeout
' ip igmp robustness-variable
' ip igmp version
' ip igmp limit (          )
' ip igmp proxy-server
'
```

clear ip igmp group*[group-address | interface-type interface-number]*

group-address

IGMP

ifname

```
Ruijie# clear ip igmp interface eth1
```

39.1.3 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

ip igmp access-group

Eth0

225.2.2.2.

```
Ruijie# configure terminal
```

```
Ruijie(config)# access-list 1 permit
```

39.1.4 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
```

39.1.5 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
```

39.1.6 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

39.1.7 ip igmp last-member-query-count

```

last-member-query-count leave
last-member-query-count
no

```

ip igmp last-member-query-count *number*

no ip igmp last-member-query-count

<i>number</i>	, <2-7>

2

```

IGMPv2
ip igmp
last-member-query-count

```

3.

```

Ruijie# configure terminal
Ruijie(config)# interface ethernet 0
Ruijie(config-if)# ip igmp last-member-query-count 3

```

39.1.8 ip igmp last-member-query-interval

no

```
ip igmp last-member-query-interval interval
```

```
no ip igmp last-member-query-interval
```

<i>interval</i>	<1-255>	0.1s

1s

```

IGMPv2
ip igmp
last-member-query-count

```

20

```

Ruijie# configure terminal
Ruijie(config)# interface eth 0
Ruijie(config-if)# ip igmp last-member-query-interval
200

```

ip igmp immediate-leave

39.1.9 ip igmp limit ()

igmp states

no

ip igmp limit *number* [**except** *access-list*]

no ip igmp limit

<i>number</i>	IGMP ,1-1024
except	<i>access-list</i> limit

access-list

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**

39.1.11 ip igmp query-max-response-time

no

ip igmp query-max-response-time *seconds*

no ip igmp query-max-response-time

<i>seconds</i>	s 1 25

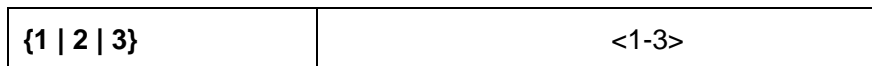
10s

IGMPv2

Ethernet 0

20s

Ruijie(config-if)#



2.

igmp

igmp

2

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

IGMP
IGMP

300

Ruijie config # `ip igmp limit 300`

39.1.16 ip igmp proxy-service

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**

39.1.18 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**

39.1.19 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

<i>interface-number</i>	
detail	

```
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
```

39.1.21 0.84

<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
    
```

39.1.22 show ip igmp ssm-mapping

IGMP ssm-map

show ip igmp ssm-mapping (A.B.C.D)

A.B.C.D	

IGMP ssm-map

40 PIM-DM

40.1 PIM-DM

PIM-DM

```
' ip pim dense-mode
' ip pim neighbor-filter
' ip pim query-interval
' ip pim state-refresh disable
' ip pim state-refresh origination-interval
' show ip pim dense-mode interface
' show ip pim dense-mode neighbor
' show ip pim dense-mode nexthop
' show ip pim dense-mode mroute
```

40.1.1 ip pim dense-mode

```
no PIM-DM ip pim dense-mode
PIM-DM
```

```
ip pim dense-mode
no ip pim dense-mode
```

PIM-DM

```
Ruijie# configure terminal
Ruijie(config)# interface fastethernet 0/1
Ruijie(config-if)# ip pim dense-mode
```

/

```
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-SM DVMRP PIM-DM v4

40.1.2 ip pim neighbor-filter

ip pim neighbor-filter
PIM-DM

Peering

no

ip pim neighbor-filter *access-list*

no ip pim neighbor-filter *access-list*

<i>access-list</i>	

```
Ruijie# configure terminal
Ruijie(config)# interface fastethernet 0/1
Ruijie(config-if)# ip pim neighbor-filter 14
```

/

ip pim neighbor-filter

- 1. ACL PIM
 ACL PIM
- 2. peering PIM
 PIM
 PIM

40.1.3 ip pim query-interval

```

hello interval                   ip pim query-interval
no                   hello interval

ip pim query-interval interval-seconds
no ip pim query-interval

```

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

30

```
hello interval hello holdtime                   hello interval 3.5
```

```

Ruijie# configure terminal
Ruijie(config)# interface fastethernet 0/1
Ruijie(config-if)# ip pim query-interval 123

```

40.1.4 ip pim state-refresh disable

```

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

```

```
ip pim state-refresh disable
no ip pim state-refresh disable
```

```

                                     Hello
SR Cap                               Hello

```

PIM-DM

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

r

```
ip pim state-refresh disable
```

PIM-DM

40.1.5 ip pim state-refresh origination-interval

```

                                     PIM-DM                                     ip pim
state-refresh origination-interval
                                     no
ip pim state-refresh origination-interval interval-seconds
no ip pim state-refresh origination-interval

```

<i>interval-seconds</i>	<1-100>

60

```
Ruijie# configure terminal
Ruijie(config)# interface fastethernet 0/1
Ruijie(config-if)# ip pim state-refresh
origination-interval 65
```

40.1.6 show ip pim dense-mode interface

PIM-DM **show ip pim dense-mode interface**

show ip pim dense-mode interface [*interface-type interface-number*]
[**detail**]

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

/ /

show ip pim dense-mode interface

```
Ruijie# show ip pim dense-mode interface
Address      Interface      VIFIndex  Ver/  Nbr
              Mode          Count
10.10.10.10  FastEthernet 0/45      3     v2/D  1
50.50.50.50  VLAN 4        2         v2/D  1
```

Address	PIM-DM	IP
Interface	PIM-DM	
VIF Index	VIF	ID

Ver/Mode	PIM /
Nbr Count	PIM-DM

show ip pim dense-mode neighbor	PIM-DM

40.1.7 show ip pim dense-mode neighbor

PIM-DM

show ip pim dense-mode neighbor

show ip pim dense-mode neighbor [*interface-type interface-number*]

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

/ /

show ip pim dense-mode neighbor

```
Ruijie# show ip pim dense-mode neighbor
Neighbor-Address Interface      Uptime/Expires    Ver
10.10.10.1      FastEthernet 0/45 00:19:29/00:01:21 v2
50.50.50.1      VLAN 4          00:22:09/00:01:39 v2
```

Neighbor-Address	
Interface	
Uptime/Expires	
Ver	PIM

40.1.8 show ip pim dense-mode nexthop

PIM-DM

show ip pim dense-mode nexthop

show ip pim dense-mode nexthop

/ /

PIM-DM

Ruijie# **show ip pim dense-mode nexthop**

```
Destination  Nexthop  Nexthop  Nexthop  Metric Pref
              Num    Addr    Interface
1.1.1.111    1        50.50.50.1  VLAN 4    0      1
```

Destination	
Nexthop Num	
Nexthop Addr	

Nexthop Interface

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
```

41 PIM-SM

41.1 PIM-SM

PIM-SM

- ' **clear ip mroute**
- ' **clear ip mroute statistics**
- ' **clear ip pim sparse-mode bsr rp-set**
- ' **ip multicast-routing**
- ' **ip pim accept-register list**
- ' **ip pim bsr-candidate**
- ' **ip pim cisco-register-checksum**
- ' **ip pim dr-priority**
- ' **ip pim ignore-rp-set-priority**
- ' **ip pim jp-timer**
- ' **ip pim mib**
- ' **ip pim neighbor-filter**
- ' **ip pim query-interval**
- ' **ip pim register-rate-limit**
- ' **ip pim register-rp-reachability**
- ' **ip pim register-source**
- ' **ip pim register-suppression**
- ' **ip pim rp-address**
- ' **ip pim rp-candidate**
- ' **ip pim rp-register-kat**
- ' **ip pim sparse-mode**
- ' **ip pim spt-threshold**
- ' **ip pim ssm**
- ' **show debugging**
- ' **show ip pim sparse-mode bsr-router**

- ' **show ip pim sparse-mode interface**
- ' **show ip pim sparse-mode local-members**
- ' **show ip pim sparse-mode mroute**
- ' **show ip pim sparse-mode neighbor**
- ' **show ip pim sparse-mode nexthop**
- ' **show ip pim sparse-mode rp mapping**
- ' **show ip pim sparse-mode rp-hash**

41.1.1 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
```

41.1.2 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
```

41.1.3 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 *
```

41.1.4 ip multicast-routing

ip multicast-routing

PIM-SM
PIM-SM

ip pim sparse-mode

```
Ruijie(config)# ip multicast-routing
```

41.1.5 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

41.1.6 ip pim bsr-candidate

ip pim bsr-candidate *interface-type interface-number*
[*hash-mask-length*][*priority-value*]

<i>access-list</i>	access-list <1 99> <1300 1999> acl group-list access-list
--------------------	---

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
```

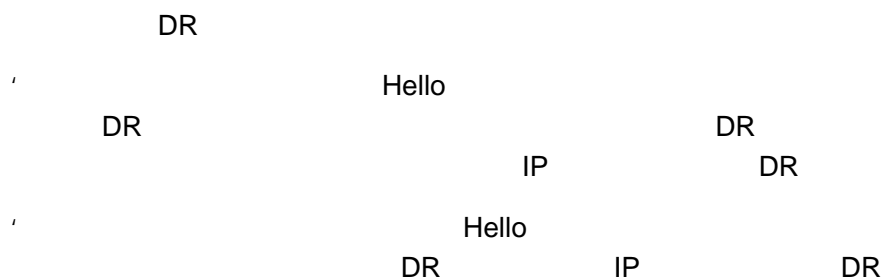
access-list

41.1.8 ip pim dr-priority

ip pim dr-priority *priority-value*

<i>priority-value</i>	<0-4294967294> 1

DR 1



```

Ruijie# configure terminal
Ruijie(config)# interface g 0/3
Ruijie(config-if)# ip pim dr-priority 10000
  
```

41.1.9 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
  
```

41.1.10 ip pim jp-timer

ip pim jp-timer *interval-seconds*

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

Join/Prune 60s

Join/Prune

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

41.1.13 ip pim query-interval

ip pim query-interval *interval-seconds*

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

Hello 30s

```

    Hello
Hello Hello Hello 3.5
Hello * 3.5 > 65535 Hello
65535
```

Ruijie#


```
Ruijie(config)# ip pim register-rp-reachability
```

41.1.16 ip pim register-source

```
ip pim register-source {local_address | interface-type
interface-number}
```

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

IP

DR

IP

RP
Register-Stop

IP

r

PIM-SM

```
Ruijie# configure terminal
Ruijie(config)# ip pim register-source 192.168.195.80
Ruijie(config)# ip pim register-source g 0/3
```

41.1.17 ip pim register-suppression

```
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
```

41.1.18 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

RP RP BSR
 ' BSR RP
 ' RP ACL

```
ACL          RP
'           RP          IP          RP
'          ACL          ACL
          224/4
'           RP          RP
          IP          RP
          IP          RP
'          RP
          RP          RP
```

```
Ruijie# configure terminal
Ruijie(config)# ip pim rp-address 210.34.0.55
Ruijie(config)# ip pim rp-address 210.34.0.55 4
Ruijie(config)# access-list 4 permit 225.1.1.1
```

RP

```

PIM-SM          RPT      RP
BSR             C-RP     BSR      C-RP
BSR      PIM

RP              ac
permit ace     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

41.1.20 ip pim rp-register-kat

ip pim rp-register-kat seconds

seconds	KAT <1-65535>

210s

RP KAT

```
Ruijie# configure terminal
```

```
Ruijie(config)# ip pim rp-B74B4/0 1 f2 0 j/0 1 f2 0kat rp-B74B4/1f
```


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**41.1.24 show debugging****show debugging**

/ /

```
Ruijie #show debugging
PIM-SM Debugging status:
PIM packet debugging is on
```

41.1.25 show ip pim sparse-mode bsr-router**show ip pim sparse-mode bsr-router**

/ /

BSR .

```
Ruijie# show ip pim sparse-mode bsr-router
PIMv2 Bootstrap information
This system is the Bootstrap Router (BSR)
BSR address: 192.168.127.1
Uptime:      01d23h14m, BSR Priority: 64, Hash mask
length: 10
Next bootstrap message in 00:00:42
Role: Candidate BSR  Priority: 64, Hash mask length: 10
State: Elected BSR
Candidate RP: 30.30.100.200(GigabitEthernet 0/3)
Advertisement interval 60 seconds
Next Cand_RP_advertisement in 00:00:32
```

41.1.26 show ip pim sparse-mode interface

show ip pim sparse-mode interface [*interface-type interface-number*]
[**detail**]

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

/ /

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

41.1.27 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

41.1.29 show ip pim sparse-mode neighbor

show ip pim sparse-mode neighbor [detail]

detail	

RP

```
Ruijie# show ip pim sparse-mode rp mapping
PIM Group-to-RP Mappings
Group(s): 224.0.0.0/4
RP: 30.30.200.1
Info source: 30.30.200.1, via bootstrap, priority 192
Uptime: 00:00:51, expires: 00:01:39
RP: 30.30.100.1
Info source: 30.30.200.1, via bootstrap, priority 192
Uptime: 00:19:14, expires: 00:01:38
Group(s): 224.0.0.0/4, Static
RP: 100.100.100.100
Uptime: 00:45:35
```

41.1.32 **show ip pim sparse-mode rp-hash**

```
show ip pim sparse-mode rp-hash group-address
```

42

42.1

- ' 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

42.1.1 clear ip mroute

IP

clear ip mroute { * | *group-address* [*source -address*]

*	
<i>group-address</i>	
<i>group_address</i> <i>source_address</i>	

230.0.0.1

Ruijie# **clear ip mroute** 230.0.0.1

show ip mroute	

42.1.2 clear ip mroute statistics

IP

clear ip mroute statistics { * | *group-address* [*source -address*]

*	
<i>group_address</i>	
<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

42.1.3 ip mroute

no

ip mroute *source-address mask [protocol] {rpf-address | interface-type interface-number} [distance]*

no ip mroute *source-address mask [protocol] {rpf-address | interface-type interface-number} [distance]*

<i>source-address</i>	
<i>mask</i>	
<i>protocol</i>	
<i>rpf-address</i>	
<i>interface-type</i> <i>interface-number</i>	
<i>distance</i>	0 RPF <1-255>

<i>limit</i>	1~2147483647 1024
<i>threshold</i>	2147483647.

limit 1024
threshold 2147483647

IPv6

r

500

Ruijie(config)# **ip multicast route-limit 500**

42.1.5 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

1

TTL TTL
TTL TTL 0

TTL 5

Ruijie(config-if)# ip multicast ttl-threshold 5

42.1.6 ip multicast-routing

no

ip multicast-routing

no ip multicast-routing

IPv4

IPv4

r

S5750 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

Incoming interface: FastEthernet 2/1
Outgoing interface list:
FastEthernet 1/3

192.168.1.54 RPF

```
Ruijie# show ip rpf 192.168.1.54
RPF information for 192.168.1.54
RPF interface: VLAN 1
RPF neighbor: 0.0.0.0
RPF route: 192.168.1.0/24
RPF type: unicast (connected)
RPF recursion count: 0
Doing distance-preferred lookups across tables
Distance: 0
Metric: 0 RPF information for 192.168.1.54
RPF interface: VLAN 1
RPF neighbor: 0.0.0.0
RPF route: 192.168.1.0/24
RPF type: unicast (connected)
RPF recursion count: 0
Doing distance-preferred lookups across tables
Distance: 0
Metric: 0
```

42.1.10 show ip mvif

Interface		Vif	Owner	TTL	Local
Remote		Uptime			
Idx	Module	Address	Address		

Ruijie# **debug nsm mcast fib-msg**

42.2.3 debug nsm mcast vif

no

debug nsm mcast vif

Ruijie# **debug nsm mcast vif**

42.2.4 debug nsm mcast register

no

debug nsm mcast register

Ruijie# **debug nsm mcast register**

42.2.5 debug nsm mcast stats

no

debug nsm mcast stats

Ruijie# **debug nsm mcast stats**

show storm-control

GigabitEthernet 1/1
4M

```
Ruijie# configure terminal  
Ruijie(config)# interface GigabitEthernet 1/1  
Ruijie(config-if)# storm-control multicast 4096  
Ruijie(config-if)# end
```

show storm-control	

43.1.2 switchport protected

no

switchport protected
no switchport protected

3

show interfaces

```
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# switchport protected
```

show interfaces	

43.1.3 protected-ports route-deny

3

3

```
protected-ports route-deny
no protected-ports route-deny
```

3

3
show running-config

```
Ruijie(config)# protected-ports route-deny
```

show running-config	3

43.1.4 switchport port-security

no

```
switchport port-security [violation {protect | restrict | shutdown}]
no switchport port-security [violation]
```

switchport port-security aging {static | time *time* }

no switchport port-security aging {static | time }

static	
<i>time</i>	1440 0 0

no switchport port-security aging
time no switchport
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	

43.1.6 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*] |
[maximum]**

	'	
mac-address <i>mac-address</i>	'	
ip-address <i>ip-address</i>	'	ID
ip-address <i>ipv6-address</i>	'	IDJ*
maximum <i>value</i>	'	

```

ACL          IP      MAC
              ACL    802.1x      IP
                   IP
              gigabitethernet 1/1
00d0.f800.073c      IP      192.168.12.202

Ruijie# configure terminal
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# switchport mode access
Ruijie(config-if)# switchport port-security
Ruijie(config-if)# switchport port-security
mac-address 00d0.f800.073c ip-address 192.168.12.202

```

show port-security	

43.1.7 arp-check

ARP

no

default

[no | default] arp-check [auto]

cpu CPU

auto :

Arp-check

Arp

arp

Ruijie(config-if)# **arp-check**

show port-security	

43.2

' show storm-control

' show port-security

43.2.1 show storm-control

show storm-control [*interface-id*]

	'
<i>interface-id</i>	'

```
Ruijie# show storm-control gigabitethernet
Interface Broadcast Control Multicast Control Unicast
Control
-----
```


43.2.2 show port-security

```
show port-security [address] [interface interface-id]
```


```
Ruijie# show port-security
Secure Port MaxSecureAddr(count) CurrentAddr(count)
Security Action
-----
Gil/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	

44 802.1X

44.1 dot1x

dot1x

- ' dot1x auto-req
- ' dot1x auto-req packet-num
- ' dot1x auto-req req-interval
- ' dot1x auto-req user-detect

44.1.1 dot1x auto-req

802.1X	dot1x auto-req
no	
[no] dot1x auto-req	

show dot1x auto-req	

44.1.2 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 0
Ruijie(config)# end
Ruijie# show dot1x auto-req
Auto-Req: Enabled
User-Detect : Enabled
Packet-Num : 0
Req-Interval: 30 Second
```

```

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	

44.1.4 dot1x auto-req user-detect

```

no

```

```

dot1x auto-req user-detect
no dot1x auto-req user-detect

```

show dot1x auto-req

```

Ruijie# configure terminal
Ruijie(config)# dot1x auto-req user-detect
Ruijie(config)# end
Ruijie# show dot1x auto-req
Auto-Req: Enabled
User-Detect : Enabled
Packet-Num : 0
Req-Interval: 60 Second

```

show dot1x auto-req	

44.2 dot1x

dot1x

- ' **dot1x timeout quiet-period**
- ' **dot1x timeout re-authperiod**
- ' **dot1x timeout server-timeout**
- ' **dot1x timeout supp-timeout**
- ' **dot1x timeout tx-period**

44.2.1 dot1x timeout quiet-period

no

dot1x timeout quiet-period *seconds*
no dot1x timeout quiet-period

seconds

0 65535 s

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

44.2.3 dot1x timeout server-timeout

no

dot1x timeout server-timeout seconds

no dot1x timeout server-timeout

seconds 0
65535

5

show dot1x 802.1x

10s

```
Ruijie# configure terminal
Ruijie(config)# dot1x timeout server-timeout 10
Ruijie(config)# end
Ruijie# show dot1x
```

```
802.1X Status:      Enabled
Authentication Mode: EAP-MD5
Authed User Number: 0
Re-authen Enabled:  Disabled
Re-authen Period:   1000 sec
Quiet Timer Period: 1000 sec
Tx Timer Period:    3 sec
Supplicant Timeout: 3 sec
Server Timeout:     10 sec
Re-authen Max:      3 times
Maximum Request:    3 times
Filter Non-RG Supp: Disabled
Client Oline Probe: Disabled
Eapol Tag Enable:   Disabled
Authorization Mode:  Group Server
```

show dot1x	802.1x

44.2.4 dot1x timeout supp-timeout

no

```
dot1x timeout supp-timeout seconds
no dot1x timeout supp-timeout
```

```
seconds 0
65535
```

3

```
show dot1x 802.1x
```

10s

```
Ruijie# configure terminal
Ruijie(config)# dot1x timeout supp-timeout 10
Ruijie(config)# end
Ruijie# show dot1x
802.1X Status: Enabled
Authentication Mode: EAP-MD5
Authed User Number: 0
Re-authen Enabled: Disabled
Re-authen Period: 1000 sec
Quiet Timer Period: 1000 sec
Tx Timer Period: 3 sec
Supplicant Timeout: 10 sec
Server Timeout: 10 sec
Re-authen Max: 3 times
Maximum Request: 3 times
Filter Non-RG Supp: Disabled
Client Oline Probe: Disabled
Eapol Tag Enable: Disabled
Authorization Mode: Group Server
```

show dot1x	802.1x

44.2.5 dot1x timeout tx-period

no

dot1x timeout tx-period *seconds*

no dot1x timeout tx-period

seconds 0 65535

Authorization Mode: Group Server

show dot1x	802.1x

44.3 dot1x

- ' dot1x re-authentication
- ' dot1x reauth-max

44.3.1 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
Tx Timer Period:       10 sec
```

802.1X

```

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

44.4 dot1x

- ' **dot1x probe-timer**
- ' **dot1x client-probe enable**

44.4.1 dot1x probe-timer

```

dot1x probe-timer{interval | alive}interval
no dot1x probe-timer

```

no

interval hello

alive

interval

Hello 20

 250

show dot1x 802.1x

hello 30 , 120

```
Ruijie# configure terminal
Ruijie(config)# dot1x probe-timer interval 30
Ruijie(config)# dot1x probe-timer alive 120
Ruijie(config)# end
Ruijie# show dot1x probe-timer
Hello Interval: 30 Seconds
Hello Alive: 120 Seconds
```

Show dot1x probe-timer	

44.4.2 dot1x client-probe enable

[no] dot1x client-probe enable

```
Ruijie# configure terminal
Ruijie(config)# dot1x client-probe enable
Ruijie(config)# end
Ruijie# show dot1x
802.1X Status: Enabled
Authentication Mode: EAP-MD5
```

Authed User Number: 0
Re-authen Enabled: Enabled
Re-authen Period: 1000 sec
Quiet Timer Period: 1000 sec
Tx Timer Period: 10 sec
Supplicant Timeout: 10 sec
Server Timeout: 10 sec
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

44.5 dot1x

dot1x

default

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

44.5.3 dot1x auth-fail max-attempt

VLAN

dot1x auth-fail max-attempt *num*

no dot1x auth-fail max-attempt

<i>num</i>	VLAN , 1-3

3

show dot1x

VLAN

```
Ruijie# configure terminal
```

```
Ruijie(config)# dot1x auth-fail max-attempt 5  
Ruijie(config)# end  
Ruijie#write
```

show dot1x

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

44.5.7 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

44.5.8 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

show running-config

802.1x

44.5.9 dot1x eapol-tag

EAPOL TAG

dot1x eapol-tag

no dot1x eapol-tag

show dot1x

802.1x

802.1X tag

Ruijie# **configure terminal**

Ruijie(config)# **dot1x eapol-tag**

Ruijie(config)# **end**

Ruijie#

show dot1x	802.1x

44.5.10 dot1x mac-auth-bypass

MAC

dot1x mac-auth-bypass

no dot1x mac-auth-bypass

--	--

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
--	--------

-

-

44.5.11 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

-	-

44.5.12 dot1x mac-auth-bypass violation

802.1x MAC

dot1x mac-auth-bypass violation

no dot1x mac-auth-bypass violation

v	

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	-	-

44.5.13 dot1x max-req

```

DOT1X
DOT1X
DOT1X
no

```

```

dot1x max-req count
no dot1x max-req

```

```
count
```

```
3
```

```
show dot1x 802.1x
```

```
802.1x 7
```

```

Ruijie# configure terminal
Ruijie(config)# dot1x max-req 7
Ruijie(config)# end
Ruijie#

```

show dot1x	802.1x

44.5.14 dot1x private-suplicant-only

no

dot1x private-supplicant-only
no dot1x private-supplicant-only

show dot1x private-supplicant-only 802.1x

```
Ruijie# configure t
Ruijie(config)# dot1x private-supplicant-only
Ruijie(config)# end
Ruijie#
```

show dot1x private-supplicant-only	

44.5.15 dot1x port-control auto

no

dot1x port-control auto
no dot1x port-control

802.1x

show dot1x 802.1x

802.1x

```

Ruijie# configure terminal
Ruijie(config)# interface g0/1
Ruijie(config-if)# dot1x port-control auto
Ruijie(config-if)# end
Ruijie#

```

show dot1x	802.1x

44.5.16 dot1x port-control-mode

802.1x

MAC

```

dot1x port-control-mode {mac-based | {port-based [single-host]} }
no dot1x port-control-mode

```

```

mac-based      mac  802.1X

```

```

port-based           802.1X

```

```

single-host           802.1x

```

```

mac-based

```

```

show dot1x port-control           802.1x

```

```

single-host           802.1x           show dot1x

```

```

port-control           port-based   show running-config

```

```

dot1x port-control-mode port-based single-host

```


802.1x

```
Ruijie# configure terminal
Ruijie(config)# dot1x stationarity enable
Ruijie(config)# end
Ruijie#
```

44.5.18 dot1x redirect url

```
802.1x
URL
URL http://
http://ruijie.net/web http://
                        https://
                        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	ip ip web
dot1x redirect time-out	
dot1x redirect num for special source-ip	
show dot1x	dot1x

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	
	-	-	

44.6 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 user id**
- ' **show dot1x timeout**

44.6.1 show dot1x

802.1x

show dot1x

Ruijie# **show dot1x**

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	

44.6.2 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

(7)14 0 Td()TjET174.96 60.46 0.4801C

(7)14 0 5f67 0 10.5 180.0

A• Ä

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	

44.6.4 show dot1x private-supPLICANT-only

show dot1x private-supPLICANT-only

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

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	

44.6.5 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	

44.6.6 show dot1x port-control

show dot1x port-control [interface



dot1x timeout quiet-period	
dot1x timeout re-authperiod	
dot1x timeout server-timeout	
dot1x timeout supp-timeout	
dot1x timeout tx-period	

dot1x timeout quiet-period	
dot1x timeout re-authperiod	
dot1x timeout server-timeout	
dot1x timeout supp-timeout	
dot1x timeout tx-period	

' 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		'

44.6.10 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	

44.6.11 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
```

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

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	

45 AAA

45.1

- ' **aaa authentication dot1x**
- ' **aaa authentication enable**
- ' **aaa authentication login**
- ' **aaa authentication ppp**
- ' **login authentication**

45.1.1 aaa authentication dot1x

AAA 802.1X }

AAA

45.1.2 aaa au

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	

45.1.3 aaa authentication login

AAA Login **aaa**
authentication login Login no

aaa authentication login {default | list-name} method1 [method2...]

no aaa authentication login {default | list-name}

default Login

list-name Login

method 4

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

45.1.4 aaa authentication ppp

AAA PPP **aaa**
authentication ppp PPP no

```
aaa authentication ppp {default | list-name} method1 [method2...]
```

```
no aaa authentication ppp {default | list-name}
```

```
default PPP
```

```
list-name PPP
```

```
method 4
```

local	
none	
group	RADIUS

```
AAA PPP AAA PPP
```

```
aaa authentication ppp
```

```
PPP
```

```
rds_ppp AAA PPP
```

```
RADIUS
```

```
RADIUS
```

```
Ruijie(config)# aaa authentication ppp rds_ppp group
radius local
```

aaa new-model	AAA
ppp authentication	PPP
username	

- ' **aaa authorization commands**
- ' **aaa authorization config-commands**
- ' **aaa authorization console**
- ' **aaa authorization exec**
- ' **aaa authorization network**
- ' **authorization commands**
- ' **authorization exec**

45.2.1 aaa authorization commands

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

level 0~15

default

list-name

method 4

none	
group	TACACS+

AAA

AAA

14

14

TACACS+ 15

```
Ruijie(config)# aaa authorization commands 15 default
group tacacs+
```

aaa new-model	AAA
authorization commands	

45.2.2 aaa authorization config-commands

AAA

aaa authorization config-commands

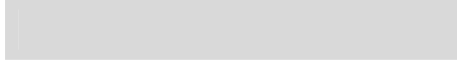
no AAA

aaa authorization config-commands**no aaa authorization config-commands**

no

Ruijie(config)# **aaa authorization config-commands**





RADIUS Exec

```
Ruijie(config)# aaa authorization exec default group
radius
```

aaa new-model	AAA
authorization exec	
username	

45.2.5 aaa authorization network

```
AAA PPP SLIP
aaa authorization network no
AAA
```

```
aaa authorization network {default | list-name} method1 [method2...]
no aaa authorization network {default | list-name}
```

```
default Network
```

```
method 4
```

none	
group	RADIUS

RADIUS
RADIUS RADIUS RADIUS
RADIUS

RADIUS

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

aaa new-model	AAA
aaa accounting	AAA
aaa authentication	AAA
username	

45.2.6 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

45.2.7 authorization exec

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

45.3

```

                                RADIUS
' aaa accounting commands
' aaa accounting exec
' aaa accounting network
' aaa accounting update
' aaa accounting update periodic
' accounting commands
' accounting exec

```

45.3.1 aaa accounting commands

```

                                NAS
                                aaa accounting commands          no
aaa accounting commands level {default | list-name} start-stop
method1 [method2...]
no aaa accounting commands level {default | list-name}

```


aaa accounting exec NAS no Exec

aaa new-model	AAA
aaa authentication	AAA
accounting commands	Exec

45.3.3 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	

45.3.4 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	

45.3.5 aaa accounting update periodic

periodic	aaa accounting update
	no

aaa accounting update periodic *interval*

no aaa accounting update periodic

<i>interval</i>	1
-----------------	---

5 minutes

AAA

level 0~15

default

list-name

```
                                cmd          15      none
TACACS+
VTY 0 - 4
Ruijie(config)# aaa accounting commands
```

list-name

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

45.4.3 server

AAA no

server ip-address [auth-port port1] [acct-port port2]

no server ip-address [auth-port port1] [acct-port port2]

ip-address ip

port1 RADIUS

port2 RADIUS

```
Ruijie(config)# aaa group server radius ss
Ruijie(config-gs-radius)# server 192.168.4.12
acct-port 5 auth-port 6
Ruijie(config-gs-radius)# end
Ruijie# show aaa group
Group Name: ss
Group Type: radius
Referred: 2
Server List:
IP Address: 192.168.4.12
Authentication Port: 6
Accounting Port: 5
Referred: 1
```

aaa group server	aaa
show aaa group	aaa

45.4.4 show aaa group

AAA

show aaa group

AAA

```
Ruijie# show aaa group
Group Name: ss
Group Type: radius
```

Referred: 2
Server List:
IP Address: 192.168.217.64
Authentication Port: 1812
Accounting Port: 1813
Referred: 1

aaa group server	AAA

45.5 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**

45.5.1 aaa local authentication attempts

login

aaa local authentication attempts *max-attempts*

max-attempts

1~2147483647

3

Login

```
Ruijie# configure terminal  
Ruijie(config)# aaa local authentication attempts 6
```

show running-config	
show aaa lockout	login

45.5.2 aaa local authentication lockout-time

login

aaa local authentication lockout-time *lockout-time*

lockout-time 1~2147483647

15

login

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

show running-config	
show aaa lockout	login

45.5.3 aaa new-model

```

AAA          AAA          aaa new-model
AAA          no          AAA
aaa new-model
no aaa new-model

```

```
AAA
```

```

AAA          AAA          AAA          AAA          AAA
aaa new-model  AAA          AAA          AAA

```

```

AAA
Ruijie(config)# aaa new-model

```

aaa authentication	
aaa authorization	
aaa accounting	

45.5.4 clear aaa local user logout

```
clear aaa local user logout {all | user-name <word>}
```

```
<word>      ID
```

```
Ruijie# clear aaa local user lockout all
```

show running-config	
show aaa lockout	login

45.5.5 debug aaa

AAA

no

debug aaa event

no debug aaa event

EXEC

45.5.6 show aaa method-list

AAA

show aaa method-list

AAA

AAA

```
Ruijie# show aaa method-list
Authentication method-list
aaa authentication login default group radius
aaa authentication ppp default group radius
aaa authentication dot1x default group radius
aaa authentication dot1x san-f local group angel group
rain none
aaa authentication enable default group radius
Accounting method-list
aaa accounting network default start-stop group radius
Authorization method-list
aaa authorizing network default group radius
```

aaa authentication	
aaa authorization	
aaa accounting	

45.5.7 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

46 RADIUS

46.1 RADIUS

RADIUS

```
' ip radius source-interface
' radius-server attribute 31
' radius-server host
' radius-server key
' radius-server retransmit
' radius-server timeout
' radius-server deadtime
' radius attribute
' radius set qos cos
' radius vendor-specific extend
```

46.1.1 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

46.1.2 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
    
```

radius-server host	RADIUS

46.1.3 radius-server host

```

RADIUS
no
radius-server host ip-address [auth-port port-number] [acct-port
port-number]
no radius-server host ip-address

```

```

Hostname: RADIUS          DNS
ip-address: RADIUS        IP
auth-port: RADIUS         UDP
port-number: RADIUS       UDP          0

acct-port: Radius         UDP
port-number: RADIUS       UDP          0

```

RADIUS

```

RADIUS  AAA          RADIUS
radius-server          RADIUS

```

RADIUS

```

Ruijie(config)# radius-server host 192.168.12.1

```

--	--

aaa authentication	AAA
radius-server key	RADIUS
radius-server retransmit	RADIUS
radius-server timeout	RADIUS

46.1.4 radius-server key

RADIUS
radius-server key no

radius-server key [0 | 7] *text-string*
no radius-server key

text-string

0 | 7 0 7

RADIUS RADIUS RADIUS

RADIUS aaa

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

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

RADIUS

46.1.5 radius-server retransmit

```
RADIUS
radius-server retransmit      no
radius-server
```

seconds

1-1000

5

10

Ruijie(config)# **radius-server timeout** 10

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

46.1.7 radius-server deadtime

t

t deadtime RGOS RADIUS

radius-server deadtime

no

radius-server deadtime *minutes*

no radius-server deadtime

minutes

1-1000

mi

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

qos cos dscp

```
Ruijie(config)# radius set qos cos
```

radius vendor-specific extend	Radius id

46.1.10 radius vendor-specific extend

id

```
radius vendor-specific extend
no radius vendor-specific extend
```

id

id

```
Ruijie(config)# radius vendor-specific extend
```

radius attribute	
radius set	qos cos

46.2 RADIUS

```
debug radius [event | detail]
```

- ' **show radius server**
- ' **show radius parameter**
- ' **show radius vendor-specific**

46.2.1 debug radius

```

RADIUS                                no                                RADIUS

debug radius {event | detail}
no debug radius {event | detail}

```

EXEC

46.2.2 show radius server

```

RADIUS

show radius server

```

radius

```

Ruijie# show radius server
server ip : 192.168.4.12
acct port: 23
authen port: 77
server state: ready
server ip : 192.168.4.13
acct port: 45
authen port: 74
server state: ready

```

radius-server host	RADIUS

radius-server retransmit
radius-server key

RADIUS
RADIUS

radius

```
Ruijie# show radius vendor-specific
id  vendor-specific      type-value
-----
1   max down-rate        76
2   qos                  77
3   user ip              3
4   vlan id              4
5   version to client    5
6   net ip               6
7   user name            7
8   password             8
9   file-diractory       9
10
```

47

47.1.3 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

47.1.4 ip tacacs source-interface

```

TACACS+

ip tacacs source-interface interface
no ip tacacs source-interface

Interface TACACS+

```

TACACS+

TACACS+

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+

47.1.6 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+

47.1.7 tacacs-server timeout

TACACS+

tacacs-server timeout *seconds*

no tacacs-server timeout

seconds

1-1000

5

EÝNM 6~AÄE;µ>Â đđÄÖáo đÄ5@Ä`µ´5'¼† B Ä Rd5

47.2.1 debug tacacs+

```
TACACS+          no          TACACS+
debug tacacs+
no debug tacacs+
```

EXEC

47.2.2 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+

48 SSH

48.1 SSH

SSH

- ' **crypto key generate**
- ' **crypto key zeroize**
- ' **ip ssh version**
- ' **ip ssh time-out**
- ' **ip ssh authentication-retries**

48.1.1 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 SSH SSH Server
 RSA SSH1 SSH2 DSA

DSA SSH2

r

no crypto key generate **crypto**
key zeroize

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

show ip ssh	SSH Server
crypto key zeroize {rsa dsa}	DSA RSA SSH Server

48.1.2 crypto key zeroize

SSH

crypto key zeroize {rsa / dsa}

rsa	RSA
dsa	DSA

DISABLE SSH Server SSH Server
service ssh-server **no enable**

```
Ruijie# configure terminal
```

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

show ip ssh	SSH Server
crypto key generate {rsa dsa}	DSA RSA

48.1.3 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

48.1.4 ip ssh time-out

SSH Server

no

ip ssh time-out ~~timeOut~~

ip ssh authentication-retries *retry times*

show ip ssh

SSH Server SSH
 Server
 SSH
 SSH

Ruijie# **show ip ssh**

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

48.2.2 show ssh

SSH

show ssh

SSH SSH VTY
 SSH

Ruijie# **show ssh**

48.2.3 show crypto key mypubkey

SSH Server

```
show crypto key mypubkey {rsa/dsa}
```

VTY SSH SSH SSH

```
Ruijie# disconnect ssh 1
```

49 CPU

49.1

```
'  cpu-protect type packet-type pps pps_value
'  cpu-protect type packet-type pri pri_value
```

49.1.1 cpu-protect type packet-type pps pps_value

CPU

```
cpu-protect type { arp | bpdu | dhcp | ipv6mc | igmp | rip | ospf | vrrp
| pim | ttl1 | unknown-ipmc | dvmrp } pps pps_value
```

pps_value

1000

CPU BPDU

```
Ruijie(config)# cpu-pr type bpdu pps 100
Set packet type bpdu pps 100 .
```

cpu-protect type packet-type pri <i>pri_num</i>	CPU

49.1.2 cpu-protect type packet-type pri pri_num

CPU

```
cpu-protect type { arp | bpdu | dhcp | ipv6mc | igmp | rip | ospf | vrrp
| pim | ttl1 | unknown-ipmc | dvmrp } pri pri_num
```

```

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	

49.2

CPU

- ' **show cpu-protect mboard**
- ' **show cpu-protect slot slot-id**
- ' **show cpu-protect type packet-type**

49.2.1 show cpu-protect mboard

CPU

```

show cpu-protect mboard

```

CPU

show cpu-protect slot slot-num	CPU

49.2.2 show cpu-protect slot

CPP

show cpu-protect slot *slot_num*

slot_num 1-16

CPP

show cpu-protect mboard	CPU

49.2.3 show cpu-protect type

show cpu-protect type { arp | bpdu | dhcp | ipv6mc | igmp | rip | ospf | vrrp | pim | ttl1 | unknown-ipmc | dvmrp } *dvmrp*

show cpu-protect type bpdu

BPDU

```
Ruijie(config)# show cpu-protect type arp
Slot      Type      Pps      Total     Drop
-----
MainBoard bpdu      100      30        0
Slot-2    bpdu      100      30        0
```

--	--

show cpu-protect type <i>packet-type</i>
--

CPU

50

50.1

- ' **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*]]

50.1.1 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	

50.1.2

<i>number</i>	20	IP 0	IP 2000
---------------	----	---------	------------

20

100

```
Ruijie(config-if)# system-guard  
scan-dest-ip-attack-packets 100
```

system-guard enable	

50.1.5 system-guard detect-maxnum *number*

no

system-guard detect-maxnum *number*

no system-guard detect-maxnum

<i>number</i>	IP 0 500 10 0

100

/20

200

Ruijie(config)# **system-guard detect-maxnum 200**

system-guard enable	

show system-guard [interface *interface-id*]

interface <i>interface-id</i>	

```
Ruijie# show system-guard
detect-maxnum number : 100 //
isolated host number : 11 //
inteface 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 //
inteface state isolate time same-attack-pkts
scan-attack-pkts
-----
Fa 0/1 ENABLE 120 20 10
```

system-guard enable	

50.2.2 show system-guard isolate-ip [interface *interface-id*]

IP

show system-guard isolate-ip [interface *interface-id*]


```
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	

50.2.4 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	

51 GSN

51.1

```
' security gsn enable
' security community
' snmp-server host
' security event interval

' security address-bind enable
```

51.1.1 security gsn enable

```
GSN no
security gsn enable
no security gsn enable
```

GSN

GSN

```
Ruijie# configure terminal
Ruijie(config)# security gsn enable
```

51.1.2 security community

```
smp
security { [ v1 | v2 ] community community | v3 user username }
no security { [ v1 | v2 ] community community | v3 user username }
```

GSN

show smp-server	smp server

51.1.4 security event interval

security event interval *interval*

no security event interval

interval

5

show security event interval

show security event interval	

51.1.5 security address-bind enable

security address-bind enable

no security address-bind enable

AP AP

GSN

Ruijie(config-if)# **security address-bind enable**

security gsn enable	GSN

51.2

show smp-server
show security event interval

51.2.1 show smp-server

smp server IP

smp server IP

Ruijie# **show smp-server**
 SMP-Server IP 192.168.20.30

smp-server host	smp server ip

51.2.2 show security event interval

52 DAI

52.1 VLAN DAI

```
ip arp inspection vlan
```

52.1.1 ip arp inspection vlan vlan-id

```

          vlan-id          VLAN  DAI
no          vlan-id          VLAN  DAI
          vlan-id          VLAN  DAI

```

```
ip arp inspection vlan vlan-id
```

```
no ip arp inspection vlan [vlan-id]
```

<i>vlan-id</i>	vlan

```
VLAN  DAI
```

```
DAI
```

```
VLAN 1  ARP
```

```
Ruijie(config)# ip arp inspection
```

```
Ruijie(config)# ip arp inspection vlan 1
```

show ip arp inspection vlan	VLAN DAI

52.2

52.2.1 ip arp inspection trust

```

trust          no
ip arp inspection trust
no ip arp inspection trust

```

ARP

DAI

ARP

gigabitEthernet 0/19

```

Ruijie(config)# interface gigabitEthernet 0/19
Ruijie(config-if)# ip arp inspection trust

```

show ip arp inspection interface	DAI

NFPP()

NFPP(μ,€
W À ĩ(• ÄARP

53

53.1.3 show anti-arp-spoofing

arp

show anti-arp-spoofing

Ruijie#**show anti-arp-spoofing**

```
port      ip
-----  -
Fa0/1     192.168.1.1
```

anti-arp-spoofing ip	arp

54 IP Source Guard

54.1 IP Source Guard

IP Source Guard

· **ip source binding**

54.1.1 ip source binding

show ip source binding	IP

54.2 IP Source Guard

IP Source Guard

· **ip verify source**

```
FastEthernet          0/1 ip          active
192.168.4.243        00d0.f801.0101 1
```

show ip verify source	IP Source Guard

54.3 IP Source Guard

```
IP Source Guard
' show ip verify source
' show ip source binding
' debug ip source bind
```

54.3.1 show ip verify source

IP Source Guard

```
show ip verify source [interface interface-id]
```

interface-id

IP Source Guard

“IP source guard is not configured on the interface FastEthernet 0/10”

IP Source Guard

```
inactive-no-snooping-vlan          DHCP Snooping
```

VLAN

```
inactive-trust-port              DHCP Snooping
```

```
active                            DHCP Snooping
```

```
Ruijie # show ip verify source
Interface          Filter-type      Filter-mode
Ip-address Mac-address  VLAN
-----
FastEthernet 0/1  ip             active         192.168.4.243
00d0.f801.0101 1
```

ip verify source	IP Source Guard

54.3.2 show ip source binding

IP

```
show ip source binding [ip-address] [mac-address]
[dhcp-snooping] [static] [vlan vlan-id] [interface interface-id]
```

```
ip-address          ip
mac-address        mac
dhcp-snooping
static
vlan-id            vlan
interface-id
```

IP

```
Ruijie#show ip source binding
MacAddress          IpAddress        Lease(sec)  Type
VLAN  Interface
-----
00d0.f801.0101  192.168.4.243  infinite   static
1    FastEthernet 0/1
Total number of bindings: 1
```

ip source binding	

54.3.3 debug ip source bind

IP Source Guard

debug ip source bind

IP Source Guard

IP Source Guard

Ruijie# **debug ip source bind**

55 NFPP

55.1

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
```

55.1.1 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
```

show arp-guard configuration	

55.1.4 arp-guard rate-limit

arp-guard rate-limit *pps* {**per-src-ip** | **per-src-mac** | **per-port**}

*pps**per-src-ip* IP*per-src-mac* MAC*per-port*

IP	MAC	4
	100	

```
Ruijie(config)# arp-guard rate-limit 2 per-src-ip
Ruijie(config)# arp-guard rate-limit 3 per-src-mac
Ruijie(config)# arp-guard rate-limit 50 per-port
```

show arp-guard configuration	

55.1.5 arp-guard attack-threshold

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

```
IP                MAC                8
                  200
```

TRAP

*Dec 27 15:34:16: %ARPGUARD-4-DOS_DETECTED: ARP DoS attack was detected.

```
ARP
show arp-guard users
```

```
0
0
```

```
0
```

TRAP VLAN=0

ARP DoS attack from user<IP=N/A,MAC=0000.0000.0004,port=Gi4/1,VLAN=1> detected.

TRAP

User<IP=N/A,MAC=0000.0000.0004,port=Gi4/1,VLAN=1> is isolated.

T

RAP

Failed to isolate

user<IP=N/A,MAC=0000.0000.0004,port=Gi4/1,VLAN=1>.

- 1) 127
ARP
- 2) 1MB
%ARPGUARD-4-MEM_LIMIT:user table's size reached limit 1MB.
- 3) %ARPGUARD-4-ISOLATE_FAILED:
failed to isolate ARP DoS attacker.
- 4) %ARPGUARD-4-NO_MEMORY: failed to alloc memory..
- 5) CPU 30
TRAP

Ruijie(config)# **arp-guard attack-threshold 2 per-src-ip**
Ruijie(config)# **arp-guard attack-threshold 3 per-src-mac**
Ruijie(config)# **arp-guard attack-threshold 50 per-port**

show arp-guard configuration	
clear arp-guard users	
show arp-guard users	

55.1.6 arp-guard scan-threshold

arp-guard scan-threshold pkt-cnt

pkt-cnt

clear arp-guard users [vlan *vid*] [interface *interface-id*] [*ip-address* | *mac-address*]

vid

interface-id

ip-address IP

mac-address MAC

VLAN 1 g 0/1

Ruijie# **clear arp-guard users vlan 1 interface g 0/1**

arp-guard attack-threshold	
show arp-guard users	

55.1.8 clear arp-guard scan

ARP

clear arp-guard scan

Ruijie# **clear arp-guard scan**

arp-guard scan-threshold	
show arp-guard scan	ARP

55.2

55.2.1 show arp-guard configuration

show arp-guard configuration

```
Ruijie# show arp-guard configuration
Rate limit: 10000 pps per-src-ip, 1 pps per-src-mac, 100
pps per-port
Attack threshold:10000 pps per-src-ip, 1 pps per-src-mac,
200 pps per-port
Scan threshold:15 packets per 10 seconds
Global isolate timeout:10800 seconds
Local isolate timeout(second):Gi4/1    permanent
```

arp-guard isolate timeout	
arp-guard rate-limit	
arp-guard attack-threshold	
arp-guard scan-threshold	

55.2.2 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	

55.2.3 show arp-guard scan

ARP

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

statistics ARP

vid

interface-id

mac-address

İ – DAÈ â Đ

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

56

ACL

precedence precedence	0-7
time-range tm-rng-name	tm-rng-name
tos tos	0-15

cos cos

cos (F2(0-) e)]TJET174.96 708484 326.52 0.48 ref174

C		12	Q	IP	36
D	VLAN tag	14	R	ip	38
E	DSAP()	18	S	ip	42
F	SSAP()	19	T	TCP	46
G	Ctrl	20	U	TCP	48
H	Org Code	21	V		50
I		24	W		54
J	IP	26	XY	IP	58
K	TOS	27	Z	flags	59
L	IP	28	a	Windows size	60
M	ID	30	b		62
N	Flags	32			

- ' **ip access-group**
- ' **mac access-group**
- ' **expert access-group**
- ' **ipv6 traffic-filter**

56.1.1 access-list

destination-mac-address | **any**} [**precedence** *precedence*] [**tos** *tos*]
[fragments] [**time-range** *time-range-name*]

Expert

Internet Control Message Protocol (ICMP)

access-list *id* {**deny** | **permit**} **icmp** [**VID** [*out*][*inner in*]] {*source source-wildcard* | **host** *source* | **any**} {**host** *source-mac-address* | **any** }
 {*destination destination-wildcard* | **host** *destination* | **any**} {**host**
destination-mac-address | **any**} [*icmp-type*] [[*icmp-type* [*icmp-code*]]]
 | [*icmp-message*]] [**precedence** *precedence*] [**tos** *tos*] [**fragments**]
[time-range *time-range-name*]

Transmission Control Protocol (TCP)

access-list *id* {**deny** | **permit**} **tcp** [**VID** [*out*][*inner in*]] {*source source-wildcard* | **host** *Source* | **any**} {**host** *source-mac-address* | **any** }
[operator *port* [*port*]] {*destination destination-wildcard* | **host**
destination | **any**} {**host** *destination-mac-address* | **any**} [**operator** **port**
 [*port*]] [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**time-range**
time-range-name] [**match-all** *tcp-flag*]

User Datagram Protocol (UDP)

access-list *id* {**deny** | **permit**} **udp**[**VID** [*out*][*inner in*]] {*source source-wildcard* | **host** *source* | **any**} {**host** *source-mac-address* | **any** }
 [**operator** *port* [*port*]] {*destination destination-wildcard* | **host**
destination | **any**} {**host** *destination-mac-address* | **any**} [**operator** **port**
 [*port*]] [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**time-range**
time-range-name]

5)

access-list *list-remark text*

<i>id</i>	1-99	100-199	1300-1999	2000-2699
2700 – 2899	700 - 799			
Deny	ACE			

Destination
destination-wildcard 0.255.0.32
fragments
precedence
precedence 0-7
time-range
time-range-name
tos
tos 0-15
icmp-type ICMP 0-255
icmp-code ICMP 0-255
icmp-message ICMP
operator lt- eq- gt- neq- range-

port [*port*] *range*

host *source-mac-address*
host *destination-mac-address*
VID *vid* *vid*
ethernet-type
match-all *tcp flag*
tcp-flag *tcp flag*

access-list

%

- ' **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
```

```
Ruijie(config)# access-list 102 permit tcp any any eq domain
```

```
Ruijie(config)# access-list 102 permit udp any any eq domain
```

```
Ruijie(config)# access-list 102 permit icmp any any echo
```

```
Ruijie(config)# access-list 102 permit icmp any any echo-reply
```

3) MAC

```
MAC 00d0f8000c0c  
100 1
```

```
Ruijie(config)# access-list 702 deny host 00d0f8000c0c any aarp
```

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

```
Ruijie(config-if)# mac access-group 702 in
```

4) Expert

ACL

show mac access-lists ACL

MAC ACL = q p 2 0 A C 5 D p 1 A C 5 4 r t D G 5 1 p 1 % D 1 a

show expert access-lists

ACL

ACL

show access-lists	IPV6

56.1.6 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	

56.1.7 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*

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**] [**fragments**] [**time-range time-range-name**]

Transmission Control Protocol (TCP)

[*sn*] **deny tcp** [[**VID** [*out*][*inner in*]]]{*source source-wildcard* | **host Source** | **any** } {**host source-mac-address** | **any** } [*operator port* [*port*]] {*destination destination-wildcard* | **host destination** | **any** } {**host destination-mac-address** | **any** } [*operator port* [*port*]] [**precedence precedence**] [**tos tos**] [**fragments**] [**time-range time-range-name**] [**match-all tcp-flag**]

inner in]]]{*source* **any** | **any**

| *hostdestination-ipv6-address*} [**dscp** *dscp*] [**flow-label**
flow-label] [**fragments**] [**time-range** *time-range-name*]

IPV6

Internet Control Message Protocol (ICMP)

[*sn*]**deny icmp** {*source-ipv6-prefix / prefix-length* | *any*
source-ipv6-address | **host**} {*destination-ipv6-prefix / prefix-length*
| **host** *destination-ipv6-address* | **any**} [*icmp-type*] [[*icmp-type*
icmp-code]] | [*icmp-message*] [**dscp** *dscp*] [**flow-label**
flow-label] [**fragments**] [**time-range** *time-range-name*]

ACL

ACL

ACL

```

Expert Extended ACL      ACL
IP      192.168.4.12      MAC      001300498272
TCP

```

```

Ruijie(config)# expert access-list extended 2702
Ruijie(config-exp-nacl)# deny tcp host
192.168.4.12 host 0013.0049.8272 any any
Ruijie(config-exp-nacl)# permit any any any any
Ruijie(config-exp-nacl)# show access-lists
expert access-list extended 2702
10 deny tcp host 192.168.4.12 host 0013.0049.8272 any
any
20 permit any any any any
Ruijie(config-exp-nacl)#

```

```

IP      ACL      IP      192.168.4.12
TCP     100      1

```

```

Ruijie(config)# ip access-list extended ip-ext-acl
Ruijie(config-ext-nacl)# deny tcp host 192.168.4.12 eq
100 any
Ruijie(config-ext-nacl)# show access-lists
ip access-list extended ip-ext-acl
10 deny tcp host 192.168.4.12 eq 100 any
Ruijie(config-ext-nacl)# exit
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# ip access-group ip-ext-acl in
Ruijie(config-if)#

```

```

MAC      ACL      MAC      0013.0049.8272
          100      1

```

```

Ruijie(config)# mac access-list extended mac1
Ruijie(config-mac-nacl)# deny host 0013.0049.8272 any
aarp
Ruijie(config-mac-nacl)# show access-lists
mac access-list extended mac1
10 deny host 0013.0049.8272 any aarp
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	ACL
ipv6 access-list	IPV6 ACL
permit	

56.1.8 permit

(permit)

ACL

ACL

1) IP

[sn] **permit** {source source-wildcard | **host** source | **any**}

2) IP

[sn] **permit protocol** source source-wildcard destination
 destination-wildcard [**precedence** precedence] [**tos** tos] [**fragments**]
 [**time-range** time-range-name]

IP

Internet Control Message Protocol (ICMP)

[sn] **permit icmp** {source source-wildcard | **host** source | **any**}
 {destination destination-wildcard | **host** destination | **any**}
 [icmp-type] [[icmp-type [icmp-code]] | [icmp-message]] [**precedence**
 precedence] [**tos** tos] [**fragments**] [**time-range** time-range-name]

Transmission Control Protocol (TCP)

[sn] **permit tcp** {source source-wildcard | **host** Source | **any**} [operator
port [port]] {destination destination-wildcard | **host** destination | **any**}
 [operator port [port]] [**precedence** precedence] [**tos** tos] [**fragments**]
 [**time-range** time-range-name] [**match-all** tcp-flag]

User Datagram Protocol (UDP)

[sn] **permit udp** {source source-wildcard|**host** source |**any**} [operator
port [port]] {destination destination-wildcard |**host** destination | **any**}
 [operator port [port]] [**precedence** precedence] [**tos** tos] [**fragments**]
 [**time-range** time-range-name]

3) MAC

[sn] **permit** {**any** | **host** source-mac-address} {**any** | **host**
 destination-mac-address} [ethernet-type][**cos** [out] [inner in]]

4) Expert

[sn] **permit** [**protocol** | [ethernet-type][**cos** [out] [inner in]]] [**VID**
 [out][inner in]] {source source-wildcard | **host** source | **any**} {**host**
 source-mac-address | **any** } {destination destination-wildcard | **host**
 destination | **any**} {**host** destination-mac-address | **any**} [**precedence**
 precedence] [**tos** tos][**fragments**] [**time-range** time-range-name]

Ethernet-type cos

[sn] **permit** {ethernet-type| **cos** [out] [inner in]} [**VID** [out][inner in]]
 {source source-wildcard | **host** source | **any**} {**host**

source-mac-address | any } {*destination destination-wildcard | host destination | any*} {**host** *destination-mac-address | any*} [**time-range** *time-range-name*]

Protocol

[*sn*] **permit protocol** [**VID** [*out*][*inner in*]] {*source source-wildcard | host Source | any*} {**host** *source-mac-address | any*} {*destination destination-wildcard | host destination | any*} {**host** *destination-mac-address | any*} [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**time-range** *time-range-name*]

Expert

Internet Control Message Protocol (ICMP)

[*sn*] **permit icmp** [**VID** [*out*][*inner in*]] {*source source-wildcard | host source | any*} {**host** *source-mac-address | any*} {*destination destination-wildcard | host destination | any*} {**host** *destination-mac-address | any*} [*icmp-type*] [[*icmp-type [icmp-code]*] | [*icmp-message*]] [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**time-range** *time-range-name*]

Transmission Control Protocol (TCP)

[*sn*] **permit tcp** [**VID** [*out*][*inner in*]] {*source source-wildcard | host Source | any*} {**host** *source-mac-address | any*} [*operator port [port]*] {*destination destination-wildcard | host destination | any*} {**host** *destination-mac-address | any*} [*operator port [port]*] [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**time-range** *time-range-name*] [**match-all** *tcp-flag*]

User Datagram Protocol (UDP)

[*sn*] **permit udp** [**VID** [*out*][*inner in*]] {*source source-wildcard | host source | any*} {**host** *source-mac-address | any*} [*operator port [port]*] {*destination destination-wildcard | host destination | any*} {**host** *destination-mac-address | any*} [*operator port [port]*] [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**time-range** *time-range-name*]

5) IPV6

[*sn*] **permit protocol** {*source-ipv6-prefix /*

| **host** *destination-ipv6-address* | **any** } [*icmp-type*] [[*icmp-type*
[*icmp-code*]] | [*icmp-message*]] [**dscp** *dscp*] [**flow-label** *flow-label*]
[**fragments**] [**time-range** *time-range-name*]

Transmission Control Protocol (TCP)

[*sn*] **permit tcp** { *source-ipv6-prefix / prefix-length* | **host**
source-ipv6-address | **any** } [*operator* **port** [*port*]]
{ *destination-ipv6-prefix / prefix-length* | **host**
destination-ipv6-address | **any** } [*operator* **port** [*port*]] [**dscp** *dscp*]
[**flow-label** *flow-label*] [**fragments**] [**time-range** *time-range-name*]
[**match-all** *tcp-flag*]

User Datagram Protocol (UDP)

[*sn*] **permit udp** [*port*]

source-ipv6-address | **any** } [*operator* **port** []] **permit tcp** { *source-ipv6-pref* [*port* [*prefix-length* | *host destination-ipv6-a2ss*

```
IP      ACL      IP  192.168.4.12
TCP     100          1
```

```
Ruijie(config)# ip access-list extended 102
Ruijie(config-ext-nacl)# permit tcp host 192.168.4.12
eq 100 any
Ruijie(config-ext-nacl)# show access-lists
ip access-list extended 102
10 permit tcp host 192.168.4.12 eq 100 any
Ruijie(config-ext-nacl)# exit
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# ip access-group 102 in
Ruijie(config-if)#
```

```
MAC     ACL     MAC  0013.0049.8272
        100          1
```

```
Ruijie(config)# mac access-list extended 702
Ruijie(config-mac-nacl)# permit host 0013.0049.8272
any aarp
Ruijie(config-mac-nacl)# show access-lists
mac access-list extended
10 permit host 0013.0049.8272 any aarp702
Ruijie(config-mac-nacl)# exit
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# mac access-group 702 in
```

```
ip      ACL      IP  192.168.4.12
        1
```

```
Ruijie(config)# ip access-list standard std-acl
Ruijie(config-std-nacl)# permit host 192.168.4.12
Ruijie(config-std-nacl)# show access-lists
ip access-list standard std-acl
10 permit host 192.168.4.12
Ruijie(config-std-nacl)# exit
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# ip access-group std-acl in
```

```
IPV6    ACL     IP  192.168.4.12
        1
```

```
Ruijie(config)# ipv6 access-list extended v6-acl
Ruijie(config-ipv6-nacl)# 11 permit ipv6
host ::192.168.4.12 any
Ruijie(config-ipv6-nacl)# show access-lists
ipv6 access-list extended v6-acl
11 permit ipv6 host ::192.168.4.12 any
Ruijie(config-ipv6-nacl)# exit
```

```
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# ipv6 traffic-filter v6-acl in
```

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

56.1.9 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

56.1.10 remark

```
ACL ACE no
remark text
```

Text

ACL

ACL

```
Ruijie# ip access-list extended 102
Ruijie(config-ext-nacl)# remark first_remark
Ruijie(config-ext-nacl)# permit tcp 1.1.1.1 0.0.0.0
2.2.2.2 0.0.0.0
Ruijie(config-ext-nacl)# remark second_remark
Ruijie(config-ext-nacl)# permit tcp 3.3.3.3 0.0.0.0
4.4.4.4 0.0.0.0
Ruijie(config-ext-nacl)# end

Ruijie# configure terminal
Ruijie(config)# access-list 80 remark test_remark
```

--	--

show access-lists

deny	ACL
permit	ACL

56.1.12 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
    
```

ACL

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

56.1.13 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

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

56.1.14 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

```

Expert ACL

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

56.1.15 ipv6 traffic-filter

IPV6 ACL no

```

ipv6 traffic-filter name {in | out}
no ipv6 traffic-filter name {in | out}

```

```

name IPV6
in
out

```

IPV6 ACL

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

56.2

- :
- ' **show access-lists**
- ' **show ip access-group**
- ' **show expert access-group**
- ' **show mac access-group**
- ' **show ipv6 traffic-filter**
- ' **show access-group**

56.2.1 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
```



56.2.3 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.
```

expert access-list	Expert ACL

56.2.4 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

56.2.5 show ipv6 traffic-filter

IPV6

show ipv6 traffic-filter [interface <interface>]

<interface>

IPv6 ACL

IPv6

ACL

```
Ruijie# show ipv6 traffic-filter interface
gigabitethernet 0/4
ipv6 traffic-filter v6 in
Applied On interface GigabitEthernet 0/4.
```

ipv6 access-list	IPV6 ACL

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.
```

ip access-group	ip
mac access-group	MAC
expert access-group	Expert
ipv6 traffic-filter	IPV6

56.3

- ' **security global access-group**
- ' **security access-group**
- ' **security uplink enable**

56.3.1 security global access-group

```
security global access-group {id|name}
```

```
no security global access-group
```

id ACL id
name ACL

```
Ruijie(config)#security global access-group 1
```

show secu-acl	

56.3.2 security access-group

security access-group {*id*|*name*}

no security access-group

id ACL id
name ACL

```
Ruijie(config-if)#security access-group 1
```

show secu-acl	

56.3.3 security uplink enable

security uplink enable

no security uplink enable

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

DSCP to CoS

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

57.2

57.2.1 mls qos trust

Qos

```
mls qos trust [cos | dscp | ip-precedence]
```

```
no mls qos trust
```

```

cos           Qos           CoS
dscp          Qos           DSCP
ip-precedence Qos           IP-PRE
no
```

```

Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# mls qos trust cos
```

```
show mls qos interface interface-id
```

57.2.2 mls qos cos

CoS

```
mls qos cos default-cos
```

no mls qos cos

MAC ACL, me

```
Ruijie(config)# mac access-list extended me
```

ACL

```
Ruijie(config-ext-macl)# permit host 1111.2222.3333  
any
```

ACL

```
Ruijie(config-ext-macl)# exit
```

class-map, cm

```
Ruijie(config)# class-map cm
```

ACL

```
Ruijie(config-cmap)# match access-group me
```

class-map

```
Ruijie(config-cmap)# exit
```

show mac access-lists

show ip access-lists

show class-map

57.2.4 Policy Maps

policy map policymap

[no] policy-map *policy-map-name*

policy map class-map ,

[no] class *class-map-name*

```
police rate-bps burst-byte[exceed-action {drop | dscp dscp-value}]
```

```
no police
```

```
policy-map-name          policymap
```

```
no policy-map policy-map-name          policy map
```

```
class-map-name          class map
```

```
no class class-map-name
```

```
new-dscp      DSCP
```

```
rate-bps          kbps
```

```
burst-byte          kbyte
```

```
drop
```

```
dscp-value          DSCP
```

```
policy map,      po
```

```
Ruijie(config)# policy-map po
```

```
class-map cm
```

```
Ruijie(config-pmap)# class cm
```

```
dscp      10
```

```
Ruijie(config-pmap-c)# set ip dscp 10
```

```
1M,          4096k,          dscp 16
```

```
Ruijie(config-pmap-c)# police 1000000 4096
```

```
exceed-action dscp 16
```

```
show policy-map
```

57.2.5 service-policy

```
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

virtual-group

output

57.2.6 priority-queue

[no] priority-queue

priority-queue SP

no priority-queue WRR

WRR

```
Ruijie(config)# no priority-queue
```

show mls qos queueing

57.2.7 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

57.2.8 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
```

57.2.9 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 qos 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
```

57.2.10 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
```

57.2.11 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
```

57.2.12 mls qos scheduler

```
mls qos4(scheduls )Tj/TT0 1 Tf0.020 Tc 0 T1087337 0 Td[( )Tj/TT1 1 Tf-0.1902 Tc 00.6 0 Tdsp
```

no mls qos scheduler

sp

rr

wrr

drr

no

wrr

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

show mls qos scheduler

57.2.13 drr-queue bandwidth

DRR

drr-queue bandwidth *weight1...weight8*

no drr-queue bandwidth

weight1...weight8

no

```
Ruijie(config)# drr-queue bandwidth 1 2 3 4 5 6 7 8
```

show mls qos queueing

57.2.14 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

virtual-group

Aggregate Port

no

virtual-group *virtual-group-number*

no virtual-group *virtual-group-number*

<i>virtual-group-number</i>	128

```

                Aggregate Port
                (          ) (          )
                48          24
                24
                1/3          3
    
```

```

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

show virtual-group	

57.3

57.3.1 show class-map

```

class map
show class-map [class-name]

class-name class map

class map
    
```

```

Ruijie# show class-map
    
```

57.3.2 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
```

57.3.3 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
```

57.3.4 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
```

57.3.5 show mls qos queueing

QoS (cos-to-queue map,wrr weight,drp weight)

show mls qos queueing

```
Ruijie# show mls qos queueing
```

57.3.6 show mls qos scheduler

show mls qos scheduler

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

57.3.7 show mls qos maps

dscp-cos maps,dscp-cos maps ip-prec-dscp maps

show mls qos maps [cos-dscp | dscp-cos | ip-prec-dscp]

cos-dscp cos-dscp maps

dscp-cos dscp-cos maps

ip-prec-dscp ip-prec-dscp maps

dscp-cos maps dscp-cos maps ip-prec-dscp maps

```
Ruijie# show mls qos maps
```

57.3.8 show mls qos rate-limit

```
show mls qos rate-limit [interface interface-id]
```

```
interface    interface-id    rate-limit
```

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

57.3.9 show virtual-group

```
show virtual-group [virtual-group-number | summary]
```

```
virtual-group-number
```

```
128
```

```
summary
```

```
Ruijie# show virtual-group 1
```

```
Ruijie# show virtual-group summary
```

58 WRED

58.1 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	S5750								
		WRED-drop	S5750								
		random-detectprobability	S5750								
Queue2	Threshold1	CoS	S5750								
		WRED-drop	S5750								
		random-detectprobability	S5750								
	Threshold2	CoS	S5750								
		WRED-drop	S5750								
		random-detectprobability	S5750								
	Threshold3	CoS	S5750								
		WRED-drop	S5750								
		random-detect probability	S5750								

/

queue1

no

wrr-queue random-detect min-threshold *queue_id* *thr1* [*thr2* *thr3*]

no wrr-queue random-detect min-threshold *queue_id*



no wrr-queue random-detect min-threshold *queue_id*

<i>queue_id</i>	
<i>prob1</i>	
<i>prob2</i>	
<i>prob3</i>	

WRED WRED WRED

S5750

S5750 2

1

Ruijie(config-if)#**wrr-queue random-detect probability 1 61 62 63**

-	-

-	-

58.2.4 wrr-queue cos-map

threshold cos
no threshold cos

wrr-queue cos-map *threshold_id cos1* [*cos2* [*cos3* [*cos4* [*cos5* [*cos6* [*cos7* [*cos8*]]]]]]]

--	--

WRED

<i>queue_id</i>	
<i>cos_value</i>	cos 1 8 0~7

cos

DSCP-CoS CoS-threshold

DSCP threshold

CoS threshold

WRED

RED

cos 1 6

cos

priority-queue cos-map

Ruijie(config-if)#wrr-queue cos-map 2 1 6

-	-

show queueing wred interface g0/1

```

-----
qid max_1 min_1 prob_1 max_2 min_2 prob_2 max_3 min_3 prob_3
-----
1 0 0 90 0 0 91 0 0 92
2 88 66 90 87 55 91 86 66 92
3 0 0 0 0 0 0 0 0 0
4 0 0 0 0 0 0 0 0 0
5 88 66 0 89 67 0 90 68 0
6 0 0 0 0 0 0 0 0 0
7 0 0 0 0 0 0 0 0 0
8 0 0 0 0 0 0 0 0 0
cos qid threshold_id
--- --- 0w'ka t`l+a t"#q$ifia t&c tff t`(|)OP,0#!5B*üD

```

59 VRRP

59.1

VRRP

- ' **vrrp authentication**
- ' **vrrp delay**
- ' **vrrp description**
- ' **vrrp ip**
- ' **vrrp preempt**
- ' **vrrp priority**
- ' **vrrp timers advertise**
- ' **vrrp timers learn**
- ' **vrrp track**

59.1.1 vrrp authentication

VRRP

```
vrrp 1 authentication x30dn78k
```



```
Ruijie(config-if)# vrrp 1 authentication x30dn78k
```


VRRP IP no
VRRP IP
vrrp group ip ipaddress [secondary]
no vrrp group ip ipaddress [secondary]

group VRRP
ipaddress IP
secondary IP
VRRP

secondary IP IP IP
VRRP VRRP IP no
VRRP IP IP

1 IP 0 VRRP VRRP
10.0.1.20 IP 10.0.2.20

I P 0 _ T w 6 . 3 8 B >

group VRRP

delay *seconds*

VRRP 100 VRRP VRRP

VRRP

VRRP 1 254

vrrp 1 priority 254

Ruijie(config-if)# vrrp group ip <i>ipaddress [secondary]</i>	VRRP IP
Ruijie(config-if)# vrrp group preempt <i>[delay seconds]</i>	VRRP

59.1.7 vrrp timers advertise

VRRP no

vrrp group timers advertise interval

no vrrp group timers advertise

group VRRP

interval VRRP ()

VRRP VRRP
1

VRRP VRRP
VRRP

VRRP

Ruijie(config-if)# vrrp group timers advertise [msec] interval	VRRP
---	------

59.1.9 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]

```

```

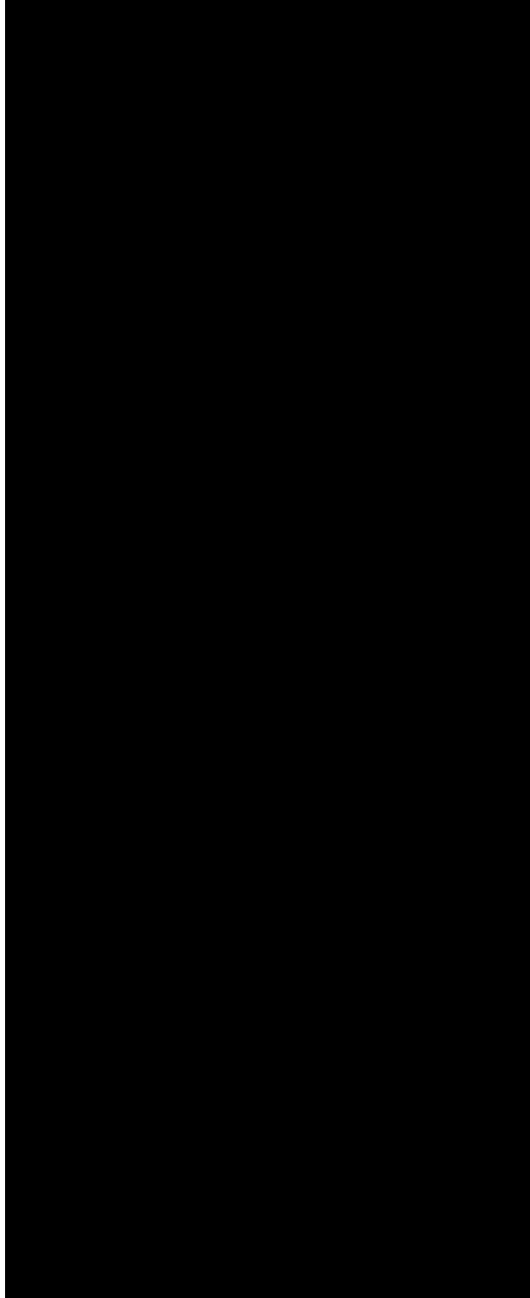
group      VRRP
interface-type
number
ipv4-address      IPv4      bfd
interval-value
3
timeout-value
1
priority
10      VRRP
VRRP      VRRP
IP

```

```

( Routed Port  SVI  Loopback  Tunnel )
IP              ping

```



59.2.1 debug 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

59.2.2 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
```

59.2.3 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
```

59.2.4 debug vrrp packets

VRRP no

debug vrrp packets
no debug vrrp packets

VRRP

VRRP

VRRP 1

Ruijie# **debug vrrp packets**

Ruijie#

VRRP: Grp 2 sending Advertisement checksum DD4D

VRRP: Grp 2 sending Advertisement checksum DD4D

VRRP: Grp 2 sending Advertisement checksum DD4D

VRRP

VRRP 1 IP VRRP 1

Ruijie# **debug vrrp packets**

Ruijie#

VRRP: Grp 1 Advertisement priority 120, ipaddr
192.168.201.213VRRP: Grp 1 Advertisement priority 120, ipaddr
192.168.201.213VRRP: Grp 1 Advertisement priority 120, ipaddr
192.168.201.213

59.2.5 debug vrrp state

VRRP

no

debug vrrp state**no debug vrrp state**

VRRP

VRRP

Ruijie# **debug vrrp state**

Ruijie#

%VRRP-6-STATECHANGE: FastEthernet 0/0 Grp 2 state Master

-> Backup

```
%VRRP-6-STATECHANGE: FastEthernet 0/0 Grp 2 state Backup  
-> Master
```

```
Ruijie# config terminal
```

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

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

```
Ruijie(config-if)# no shutdown
```

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

```
Ruijie#
```

```
%VRRP-6-STATECHANGE: FastEthernet 0/0 Grp 2 state Master
```

```
-> Init
```

59.3

59.3.1 show vrrp

VRRP

```
show vrrp [ brief | group ]
```

brief

```

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

59.3.2 show vrrp interface

VRRP

```
show vrrp interface type number [ brief ]
```

type

number

brief

E1/0 VRRP

```

Ruijie# show vrrp interface fastethernet 0/0
FastEthernet 0/0 - Group 1
State is Backup
Virtual IP address is 192.168.201.1 configured
Virtual MAC address is 0000.5e00.0101
Advertisement interval is 3 sec
Preemption is enabled
min delay is 0 sec
Priority is 100
Master Router is 192.168.201.213 , pritority is 120
Master Advertisement interval is 3 sec
Master Down interval is 9 sec
FastEthernet 0/0 - Group 2
State is Master
Virtual IP address is 192.168.201.2 configured
Virtual MAC address is 0000.5e00.0102
Advertisement interval is 3 sec
Preemption is enabled
min delay is 0 sec
Priority is 120
Master Router is 192.168.201.217 (local), priority is
120
Master Advertisement interval is 3 sec
Master Down interval is 9 sec

```

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

BFD

```
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

60.1.2 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

60.1.3 bfd cpp

```
bfd cpp BFD no BFD
```

bfd cpp

no bfd cpp

-	-

BFD

BFD

BFD

BFD

BFD

BFD

BFD

BFD

```
# BFD
Ruijie(config)# bfd cpp
```

-	-

60.1.4 bfd echo

bfd echo **echo** **no** **echo**

bfd echo

no bfd echo

-	-

```
Ruijie(config)# no switchport
Ruijie(config-if)# bfd echo
```

bfd	BFD
ip redirects	ICMP
ip deny land	Land-based
bfd slow-timer	

60.1.5 bfd slow-timer

```
bfd slow-timer          BFD          ECHO
                        BFD            no
```

```
bfd slow-timer [milliseconds]
```

```
no bfd slow-timer
```

<i>milliseconds</i>	fl 8 8 %\$\$\$ ' \$\$\$\$z %\$\$\$

```
%$$$ag
```

```
# slow-timer 14000
```

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

bfd echo	BFD Echo

60.1.6 bfd up-dampening

└──

	10.3(5)	

60.1.7 ip ospf bfd

bfd	BFD
bfd all-interfaces	BFD

```

ip rip bfd          RIP      BFD
disable            no
ip rip bfd [disable]
no ip rip bfd
    
```

disable	fl t FID 6 8

```

X] gU Y          RIP      6 8
    
```

```

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

```

# Routed Port    FastEthernet 0/2      RIP      BFD
Ruijie(config)# interface FastEthernet 0/2
Ruijie(config-if)# no switchport
Ruijie(config-if)# ip rip bfd disable
    
```

--	--

bfd	BFD
bfd all-interfaces	BFD

```
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

60.1.10 neighbor fall-over bfd

```
router      address-family      ,      neighbor fall-over      BGP
BFD        BGP      ,      no
```

```
Ruijie(config-router)# neighbor 172.16.0.2 fall-over bfd
Ruijie(config-router)# end
```

bfd	BFD

60.1.11 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*]

j fZ j fZ! bUaY	fl t JF:
bYl h! \cd! UXXfYgg	fl t ID
hfUW	fl t HFUW
bi aVYf	fl t hfUW
VZ	tcha D A

r	ID	6 8
----------	----	-----

#	BFD	BFD	172.16.0.2
---	-----	-----	------------

Ruijie#**configure terminal**

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

Ruijie(config)# **route-map** Example1 **permit** 10

Ruijie(config-route-map)# **match ip address** 1

Ruijie(config-route-map)# **set ip precedence priority**

Ruijie(config-route-map)#**set ip next-hop**
verify-availability 172.16.0.2 **bfd** FastEthernet 0/1
172.16.0.2

Ruijie(config-route-map)#**end**



```
          ID          68
r          JFFD          ž
          ID
```

```
#          VRRP          BFD          BFD
```

```
Ruijie#configure terminal
```

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

```
Ruijie- 0 0 10.026<354204120s82.912 0 TdiEnteface026<35420 1 Tf53892 0
```

j fZ j fZ! blaY	() VRF
W]Ybh	()
V[d	BGP BFD
cgdZ	OSPF BFD
f]d	RIP BFD
j ffd	VRRP BFD
ghUh] Wfci hY	StaticRoute BFD
dVf	PBR BFD
]dj (]d! UXXYgg	IPv4
]dj *]d! UXXYgg	IPv6
XYhU]`g	

show bfd neighbors

Ruijie# show bfd neighbors

```

OurAddr      NeighAddr    LD/RD  RH    Holdown(mult)  State
Int
172.16.11.1  172.16.11.2  1/2    1     532 (3 )      Up
Ge2/1

```

show bfd neighbors details

Ruijie# show bfd neighbors details

```

OurAddr      NeighAddr    LD/RD  RH    Holdown(mult)  State
Int
172.16.11.1  172.16.11.2  1/2    1     532 (3 )      Up
Ge2/1

```

Local Diag: 0, Demand mode: 0, Poll bit: 0

MinTxInt: 200000, MinRxInt: 200000, Multiplier: 5

Received MinRxInt: 50000, Received Multiplier: 3

Holdown (hits): 600(22), Hello (hits): 200(84453)

Rx Count: 49824, Rx Interval (ms) min/max/avg: 208/440/332

Tx Count: 84488, Tx Interval (ms) min/max/avg: 152/248/196

Registered protocols: BGP

Uptime: 02:18:49

Last packet: Version: 1 - Diagnostic: 0

I Hear You bit: 1 - Demand bit: 0

Poll bit: 0 - Final bit: 0

Multiplier: 3 - Length: 24

My Discr.: 2 - Your Discr.: 1

Min tx interval: 50000 - Min rx interval: 50000

Min Echo interval: 0

OurAddr	IP
NeighAddr	IP
LD/RD	
RH	
Holdown(mult	hello
State	
Int	
Session state is UP and	echo echo (
Local Diag	
Demand	
Poll bit	
MinTxInt	
MinRxInt	
Multiplier	
Received	
Received	

Holdown (hits)

Tx Interval	
Registered	
Uptime	UP
Last packet	BFD

-	-

rerp region	RERP

61.1.2 rerp hello-interval

RERP

rerp hello-interval *interval***no rerp hello-interval***interval* 1-6

1

2s

Ruijie(config)# **rerp hello-interval 2**

rerp fail- interval	

61.1.3 rerp fail-interval

RERP hello
backup transit master**rerp fail- interval** *num***no rerp fail- interval***num* , 3-18

3

6 :

Ruijie(config)# **rerp fail-interval 6**

rerp hello- interval	

61.1.4 rerp region

RERP RERP

rerp region *num***no rerp region** *num**num* , 1-64Ruijie# **rerp region 1**

--	--

RERP

rerp enable	RERP
--------------------	------

61.1.5 ring

RERP

```

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

```

Ä

?à

9

RERP

majory-ring

```
Ruijie(config)# rerp region 1
```

```
Ruijie(config-rerp)# major-ring 1 edge-ring-vlan 100
```


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

61.2.3 clear rerp statistics

RERP

clear rerp statistics

EXEC

61.2.4 debug rerp

RERP

no

debug rerp [packet | event]

undebg rerp [packet | event]

packet

event

EXEC

62 REUP

62.1

REUP

- ' **mac-address-table move update receive**
- ' **mac-address-table move update transmit**

- ' **switchport backup interface *interface-id***
- ' **switchport backup interface *interface-id* **preemption****
- ' **mac-address-table update group**

62.1.1 switchport backup interface *interface-id*

REUP

switchport backup interface *interface-id*

no switchport backup

interface-id

ID

interface-id

fa 0/1

fa 0/2

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

Ruijie(config-if)# **switchport backup interface *fa 0/2***

show interface switchport backup	

62.1.2 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 *df04b3.011 TcT/JT3 1 T*

```
preemption delay 40
```

show interface switchport backup	

62.1.3 mac-address-table move update receive

```
REUP    MAC
```

```
mac-address-table move update receive
```

```
no mac-address-table move update receive
```

```
MAC
```

```
MAC
```

```
MAC
```

```
MAC
```

```
Ruijie(config)# mac-address-table move update receive
```

mac-address-table move update transit	MAC

62.1.4 mac-address-table move update transit

```
REUP    MAC
```

```
mac-address-table move update transit
```


REUP

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)
```

63 RLDP

63.1

RLDP

- > rldp detect-interval
- > rldp detect-max
- > rldp enable
- > rldp loop-detect enable

63.1.1 rldp loop-detect enable

RLDP

rldp loop-detect enable

no rldp loop-detect enable

└───┘

└───┘

└───┘

RLDP

RLDP

└───┘

Ruijie(config)# **rldp loop-detect enable**

	rldp port	RLDP

-	-

- > rldp port{ unidirection-detect | bidirection-detect | loop-detect } { warning | shutdown-svi | shutdown-port | block }
- > rldp reset

63.1.2 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
    
```

63.1.3 rldp detect-max

RLDP

rldp detect-max *num***no rldp detect-max**

	<i>num</i>	, 2-10

	2
--	---

--

	rldp port	RLDP
	-	-

63.1.6 rldp port

rldp

rldp port { unidirection-detect | bidirection-detect | loop-detect } { warning | shutdown-svi | shutdown-port | block }

no rldp port { unidirection-detect | bidirection-detect | loop-detect }

unidirection-detect	
bidirection-detect	

loop-detectR(())T/C2_0 1 Tf0 Tc 15.467 0.006 Td[2983243C<1E94231F>6<324F0D5F>]T/T

└──

└──

└──

	-	-

└──

	-	-

64 DLDP

64.1

DLDP

- > [dldp](#)
- > [dldp passive](#)
- > [clear dldp](#)

64.1.1 dldp

DLDP

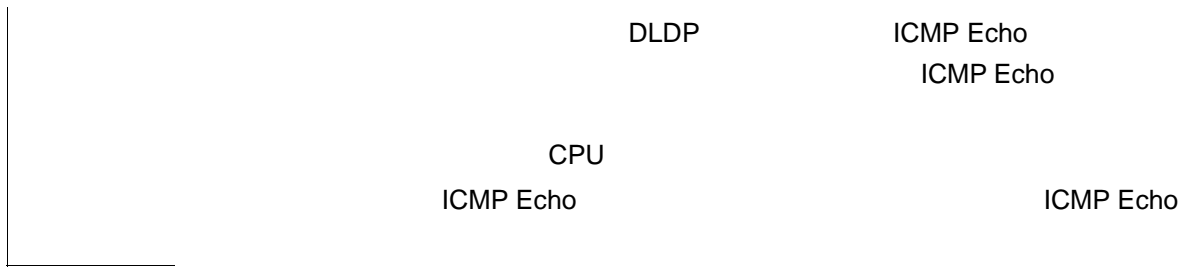
no

IP DLDP

dldp *ip-address* [**next-hop** *ipv4-address*] [**interval** *tick* | **retry** *retry-num* | **resume** *resume-num*]

no dldp *ip-address*

DLDP



```

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)#lldp passive
    
```

-	-

10.3(5)

-	-

64.2

DLDP

> [show dldp](#) - 26(dldp_0 1 Tf0 Tc 3.162 0 02 0 0 1.5 169.86 448.3403248 869A345C4>A51

	-	-

65 TPP

65.1

CPU

(AP)

```
Ruijie(config-if)# tp-guard port enable  
Ruijie(config-if)# no tp-guard port enable
```

topology guard

65.2 TPP

65.2.1 show tpp

show tpp

tpp

```
Ruijie# show tpp
```

topology guard

66

66.1

- ' **cd**
- ' **cp**
- ' **ls**
- ' **makefs**
- ' **mkdir**
- ' **mv**
- ' **pwd**
- ' **rm**
- ' **rmdir**

66.1.1 cd

cd *DIRECTORY*

ls	

66.1.2 cp

cp dest {*DESTINE_FILE* | *DIRECTORY*} **sour** *SOURCE_FILE*

cp sour *SOURCE_FILE* **dest** {*DESTINE_FILE* | *DIRECTORY*}

DESTINE_FILE

DIRECTORY

SOURCE_FILE ()

r

cp

log.txt :

Ruijie# **cp sour** *log.txt* **dest** *../log_bak.txt*

66.1.3 ls

ls *PATHNAME*

PATHNAME

```
Ruijie# ls
      tmp
Ruijie# ls tmp
```

66.1.4 makefs

makefs dev *DEVNAME* **fs** *FSNAME*

makefs fs *FSNAME* **dev** *DEVNAME*

DEVNAME ()

FSNAME

jffs2

dev/mtdblock/1

```
Ruijie# makefs dev /dev/mtdblock/1 fs jffs2
```

66.1.5 mkdir

mkdir *DIRECTORY*

DIRECTORY

()

test

```
Ruijie# mkdir test
```

66.1.6 mv

mv sour *SOURCE_FILE* **dest** {*DESTINE_FILE* | *DIRECTORY*}

mv dest {*DESTINE_FILE* | *DIRECTORY*} **sour** *SOURCE_FILE*

SOURCE_FILE

DESTINE_FILE/DIRECTORY

```
          a          ( type file); b '?'  
          ' ? '  
,  
  
          log.txt          ,          config.txt,  
,  
Ruijie# mv sour tmp/log.txt dest ../config.txt  
          log.txt          tmp          mv sod (des
```

rm *FILE*

FILE ()

,

log.txt

Ruijie# **rm** log.txt

rmdir	, rm ,

66.1.9 rmdir

rmdir *directory*

directory ,

rm

tmp

Ruijie# **rmdir** *tmp*

Ruijie# **ls**

67

67.1 CPU-LOG

- ' show cpu
- ' cpu-log

67.1.1 show cpu

CPU show cpu
show cpu

CPU 5 1
CPU CPU 5 5
CPU 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_mt
17	0%	0%	0%	ll main process
18	0%	0%	0%	bridge_relay
19	0%	0%	0%	dlx_task
20	0%	0%	0%	secu_policy_task
21	0%	0%	0%	dhcpa_task
22	0%	0%	0%	dhcpsnp_task
23	0%	0%	0%	igmp_snp
24	0%	0%	0%	mstp_event
25	0%	0%	0%	GVRP_EVENT
26	0%	0%	0%	rldp_task
27	0%	2%	1%	rerp_task
28	0%	0%	0%	reup_event_handler
29	0%	0%	0%	tpp_task
30	0%	0%	0%	ip6timer
31	0%	0%	0%	rtadvd
32	0%	0%	0%	tnet6
33	2%	0%	0%	tnet
34	0%	0%	0%	Tarptime
35	0%	0%	0%	gra_arp
36	0%	0%	0%	Ttcptimer
37	8%	1%	0%	ef_res
38	0%	0%	0%	ef_rcv_msg
39	0%	0%	0%	ef_inconsistent_daemon
40	0%	0%	0%	ip6_tunnel_rcv_pkt
41	0%	0%	0%	res6t
42	0%	0%	0%	tunrt6
43	0%	0%	0%	ef6_rcv_msg
44	0%	0%	0%	ef6_inconsistent_daemon
45	0%	0%	0%	imid
46	0%	0%	0%	nsmd
47	0%	0%	0%	ripd
48	0%	0%	0%	ripngd
49	0%	0%	0%	ospfd
50	0%	0%	0%	ospf6d

51	0%	0%	0%	bgpd
52	0%	0%	0%	pimd
53	0%	0%	0%	pim6d
54	0%	0%	0%	pdmd
55	0%	0%	0%	dvmrpd
56	0%	0%	0%	vty_connect
57	0%	0%	0%	aaa_task
58	0%	0%	0%	Tlogtrap
59	0%	0%	0%	dhcp6c
60	0%	0%	0%	sntp_recv_task
61	0%	0%	0%	ntp_task
62	0%	0%	0%	sla_daemon
63	0%	3%	1%	track_daemon
64	0%	0%	0%	pbr_guard
65	0%	0%	0%	vrrpd
66	0%	0%	0%	psnps
67	0%	0%	0%	igsnpd
68	0%	0%	0%	coa_recv
69	0%	0%	0%	co_oper
70	0%	0%	0%	co_mac
71	0%	0%	0%	radius_task
72	0%	0%	0%	tac+_acct_task
73	0%	0%	0%	tac+_task
74	0%	0%	0%	dhcpd_task
75	0%	0%	0%	dhcps_task
76	0%	0%	0%	dhcpping_task
77	0%	0%	0%	dhcpc_task
78	0%	0%	0%	uart_debug_file_task
79	0%	0%	0%	ssp_init_task
80	0%	0%	0%	rl_listen
81	0%	0%	0%	ikl_msg_operate_thread
82	0%	0%	0%	bcmDPC
83	0%	0%	0%	bcmL2X.0
84	3%	3%	3%	bcmL2X.0
85	0%	0%	0%	bcmCNTR.0
86	0%	0%	0%	bcmTX
87	0%	0%	0%	bcmXGS3AsyncTX
88	0%	2%	1%	bcmLINK.0
89	0%	0%	0%	bcmRX
90	0%	0%	0%	mngpkt_rcv_thread
91	0%	0%	0%	mngpkt_recycle_thread
92	0%	0%	0%	stack_task
93	0%	0%	0%	stack_disc_task
94	0%	0%	0%	redun_sync_task
95	0%	0%	0%	conf_dispatch_task
96	0%	0%	0%	devprob_task

97	0%	0%	0%	rdp_snd_thread
98	0%	0%	0%	rdp_rcv_thread
99	0%	0%	0%	rdp_slot_change_thread
100	4%	2%	1%	datapkt_rcv_thread
101	0%	0%	0%	keepalive_link_notify
102	0%	0%	0%	rerp_msg_rcv_thread
103	0%	0%	0%	ip_scan_guard_task
104	0%	0%	0%	ssp_ipmc_hit_task
105	0%	0%	0%	ssp_ipmc_trap_task
106	0%	0%	0%	hw_err_snd_task
107	0%	0%	0%	rerp_packet_send_task
108	0%	0%	0%	idle_vlan_proc_thread
109	0%	0%	0%	cmic_pause_detect
110	1%	1%	1%	stat_get_and_send
111	0%	1%	0%	rl_con
112	75%	80%	90%	idle

```

          5          3          5          1
          CPU      LISR  HISR
          CPU
'   No
'   5Sec          5      CPU
'   1Min          1      CPU
'   5Min          5      CPU
          2          LISR  CPU          HISR
          CPU      CPU
          idle      CPU      Windows      System Idle Process
          75%      CPU      75%      idle      5      CPU

```

67.1.2 cpu-log

```

          CPU      ,      cpu-log
cpu-log log-limit low_num high_num

log-limit
low_num CPU
high_num CPU

```

```

          100%      90%

          CPU          CPU
        CPU      CPU
      CPU          CPU
    CPU          CPU

          CPU          70% CPU
        80%

ruijie(config)# cpu-log log-limit 70 80

      CPU          80%

Oct 20 15:47:01 %SYSCHECK-5-CPU_USING_RATE: CPU
utilization in one minute : 95% Using most cpu's task
is ktimer : 94%

      CPU          70%

Oct 20 15:47:01 %SYSCHECK-5-CPU_USING_RATE: CPU
utilization in one minute :68% Using most cpu's task
is ktimer : 60%
Oct 20 15:47:01 %SYSCHECK-5-CPU_USING_RATE: The CPU
using rate has down!

```

67.2

```

show memory
memory-lack exit-policy
show memory protocols

```

67.2.1 show memory

```

show

memory

show memory

```

worsen
OSPF RIP PIM-SM

policy (bgp|ospf|pim-sm|rip)

exit-policy

p	BGP OSPF PIM RIP

show memory protocols

/ BGP,OSPF,RIP,LDP,PIM,ISIS

1 show memory protocols
Ruijie(config)# **show memory protocols**

```
=====
protocol      |memory(byte)
BGP           |102000000
OSPF          |24000000
RIP           |10000000
PIM           |50000000
LDP           |20000000
Total        |206000000
```

show memory	

-

67.3

67.3.1

> [threshold set](#)

2

Ruijie# **show threshold memory**



68

68.1

68.1.1 logging on

no

logging on

no logging on

RGOS

Console

VTY

FLASH Syslog Server

1 Log

Ruijie(config)# **no logging on**

logging buffered	

logging

logging monitor	VTY (telnet)
logging trap	Syslog Server

68.1.2 terminal monitor

```

VTY
no
terminal monitor
terminal no monitor

```

```

VTY VTY

```

```

VTY VTY
VTY

```

```

/
no , RGOS 0 1

```

```

VTY
Ruijie# terminal monitor
Ruijie#

```

68.1.3 logging buffered

no logging buffered

buffer-size 4K 128K Bytes
levell 0 7

4k Bytes
7

show logging

clear logging
FLASH Syslog Server
RGOS 8
1

Emergencies	0	
Alerts	1	
Critical	2	
Errors	3	
warnings	4	
Notifications	5	
informational	6	
Debugging	7	

0

```
Ruijie(config)# logging buffered 10000 6
```

logging on	
show logging	
clear logging	

68.1.4 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

logging on	

```

1.
2.
   txt
3.   15
           FLASH           FLASH
16

```

```

           FLASH           trace.txt
64K,           6
Ruijie(config)# logging file flash:trace

```

logging on	
show logging	
more flash	FLASH

68.1.6 logging console

```

no
logging console level
no logging console

level           0 7
1

```

Debugging (7)

show logging

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

logging on	
logging	Syslog Server
show logging	

68.1.9 logging source interface

no

logging source interface *interface-type interface-number*

no logging source interface

interface-type

interface-number

Syslog Server

Loopback 0

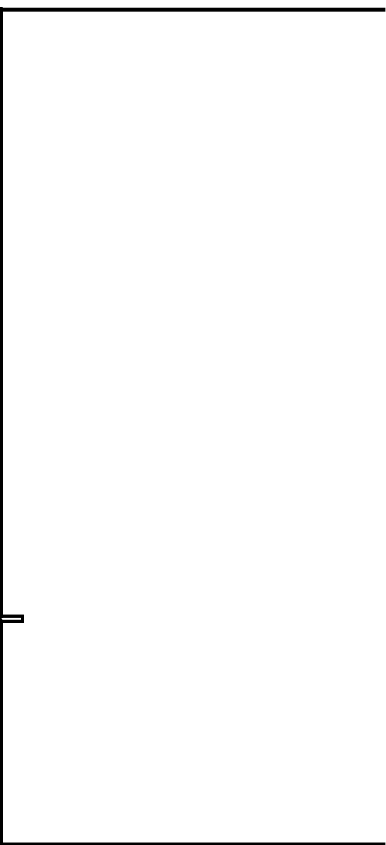
Syslog

```
Ruijie(config)# logging source interface loopback 0
```

Local7(23)

2 Syslog

2



- .
- .
- .
- .
- .
- .
- .
- .
- .
- .
- .

count

no logging

Ruijie(config)# **logging count**

show logging count	
show logging	

68.1.13 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;

```
debug 10
warning
Ruijie(config)#logging rate-limit all 10 except
warnings
```

show logging count	
show logging	

68.1.14 logging synchronous

```
no
logging synchronous
no logging synchronous
```

```
Ruijie(config)#  
Ruijie(config)#line console 0  
Ruijie(config-line)#logging synchronous
```

UP-DOWN

```
Ruijie#configure terminal  
Oct 9 23:40:55 %LINK-5-CHANGED: Interface  
GigabitEthernet 0/1, changed state to down  
Oct 9 23:40:55 %LINEPROTO-5-UPDOWN: Line protocol on  
Interface GigabitEthernet 0/1, changed state to DOWN  
Ruijie#configure terminal ----
```

show running-config	

68.1.15 service sequence-numbers

```
no  
service sequence-numbers  
no service sequence-numbers
```

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

logging on	
service timestamps	

68.1.16 service timestamps

no

default

service timestamps *message-type* [*uptime* | *datetime* [*msec* | *year*]]

no service timestamps *message-type*

default service timestamps *message-type*

message-type

0 6

log debug log
debug

7

uptime

* * * *

07:00:10:41

datetime

Jul 27 16:53:07

msec

: : .

Jul 27 16:53:07.299

year

: : .

2007

Jul 27 16:53:07

RTC

Uptime

Datetime

Log

Debug

Datetime

Ruijie(config)# **service timestamps debug datetime msec**

Ruijie(config)#

```
Ruijie(config)# service sysname
Ruijie(config)# end
Ruijie#
Mar 22 15:35:57 S3250 %SYS-5-CONFIG: Configured from
console by console
```

show logging	

68.1.18 more flash

Buffer logging	
Timestamp debug messages	Debug
Timestamp log messages	Log
Sequence log messages	
Trap logging	Syslog Server
Log Buffer	

logging on	
clear logging	

68.2.2 show logging count

show logging count

```

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
00006 2004-11-17 10:57:43 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
00004 2004-11-17 10:57:21 Ruijie: %7:%LINK CHANGED:
Interface FastEthernet 0/1, changed state to down
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	

69 POE

POE

' **Poe enable**

POE 46

```
Ruijie# configure  
Ruijie(config)# poe-power lower 46  
Ruijie(config)# end  
Ruijie#
```

69.1.3 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
```

69.1.4 poe disconnect-mode mode

no

poe disconnect-mode *mode*

no poe disconnect-mode

mode [ac/dc]

POE dc

```
Ruijie# configure  
Ruijie(config)# poe disconnect-mode dc
```

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

69.2

POE

```
' show poe interfaces  
' show poe powersupply
```

69.2.1 show poe interfaces

POE

```
show poe interfaces interface-id
```

poe

```
Ruijie# show poe interface gigabitethernet 0/2  
Interface : Gi0/2  
Port power enabled : ENABLE  
Port connect status : OFF  
Port PD Class : no PD devices  
Port max power : 15.4 W  
Port current power : 0 W  
Port peak power : 0 W  
Port current : 0 mA  
Port voltage : 48 V  
Port trouble cause : normal
```

69.2.2 show poe powersupply

POE

```
show poe powersupply
```

```
Ruijie# show poe powersupply
```

PSE Total Power :1200.0 W
PSE Total Power Consumption : 0 W
PSE Available Power : 1200.0 W
PSE Peak Value : 0 W
PSE Min Allow Voltage : 45 V
PSE Max Allow Voltage : 57 V
PSE Disconnect Sense Mode : ac

70

- ' **device-priority**
- ' **device-description**
- ' **show member**

70.1

70.1.1 device-priority

device-priority [*member*] *priority*

<i>member</i>	ID member 1
<i>priority</i>	[1, 10]

1 10 10

1

write

2

8

Ruijie(config)# **device-priority** 2 8

--	--

show member	
-------------	--

70.1.2 device-description

device-description [*member member*] *description*

member <i>member</i>	ID member 1
<i>description</i>	31

write

2 red-giant

Ruijie(config)# **device-description member 2 red-giant**

show member	

70.2

70.2.1 show member

show member [*member*]

--	--

<i>member</i>	ID
---------------	----

Ruijie# **show member**

```

Member Mac Address      Priority Software Version
HardwareVersion Description
-----
1          00d0.f810.3323   1          RGOS 10.1.00(2),
Release(12889) 1.0          SWITCH
2          00d0.f822.33aa   1          RGOS 10.1.00(2),
Release(12889) 1.0          SWITCH
3          00d0.f822.33ae   1          RGOS 10.1.00(2),
Release(12889) 1.0          SWITCH
4          00d0.f822.33b0   1          RGOS 10.1.00(2),
Release(12889) 1.0          SWITCH
5          00d0.f822.33b2   1          RGOS 10.1.00(2),
Release(12889) 1.0          SWITCH
6          00d0.f824.23b4   1          RGOS 10.1.00(2),
Release(12889) 1.0          SWITCH
7          00d0.f833.44b4   1          RGOS 10.1.00(2),
Release(12889) 1.0          SWITCH
8          00d0.f855.33ae   1          RGOS 10.1.00(2),
Release(12889) 1.0          SWITCH

```