

Ruijie

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RGOS® à RGNOS® à 锐捷网络® à



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1 CLI

1.1 alias

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```
alias mode command-alias original-command
no alias mode original-command
```

Ồ Ô

```
mode '      1 3      3      3      Â
command-alias '      3 1 Â
original-command '      1 3      3      Â
```

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3 1	3
h	help
p	ping
s	show
u	undebug
un	undebug

[illegible]

```
Ruijie(config)# alias ?
```

```

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

```

```

{ 1  || ~ 1  ^ ~ ~ 3  几
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```

```
*command-alias=original-command
```

```

~  Ю  { 1  ^
↓ 几  ↓ 1  || '

```

```
Ruijie# s?
```

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

```

1 { 3 a ~ 1 {  ^
~  Ю 1 { 3 show version~ '

```

```
Ruijie# s?
```

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

```

1  ÿ  {  ~  a  ^  3
~  {  ~  a  ↓'

```

```
Ruijie# s?
```

```
show start-chat start-terminal-service
```

```

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{ 1 {  Q ~  Ю'  & 9 @ 0 J  "  $

```

```
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

```

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show aliases	↓

1.2 privilege

```

privilege 3 ^ 3 no 3 ~ ↓ ∪ Ю
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```

```

privilege mode all level level | reset command-string
no privilege mode all level level command-string

```

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```

mode ' 3 3 ^
all ' 3 3 ~ ↓ й ↓ ^
level ' 3 3 ~ ^
reset ' 3 й ^
command-string ' 3 ^

```

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```

Ю ↑ privilege 3 ↓ 3 ~
a ↓ ~ ↓ 3 ↓ ↓ ~ Ю
↓ ∪ privilege ? ↓ 3 ^

```

config	

exec	
interface	
ip-dhcp-pool	
keychain	
keychain-key	
time-range	

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ЛЮ Й reload Ъ

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

↓ reload }

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

all

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

↓ reload }

```
Ruijie> reload ?
```

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

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Ruijie# **show aliases exec**

exec mode alias:

h help
p ping
s show
u undebug
un undebug

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alias	3 1

2

2.1

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, 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

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disable *privilege-level*

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privilege-level

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&

disable 3 1 Â

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 Ruijie# **disable 10**

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enable	ÿ Â ~

2.1.2 enable

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2.1.3 enable password

a 1 3 ~ 3 **enable password &**

[illegible]
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```
Ruijie(config)# enable password pw10
```

$\mathfrak{z}$	
enable secret	$\mathfrak{z} \hat{A}$

```

a ↯      {~
{ no      { Â    } enable secret Â

```

Secret ' $\hat{A}$

Level ' $\hat{A}$

0|5 ' $\hat{A}$

encrypted-password ' $\hat{A}$

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enable password	a 7 3 Â

2.1.6 password

no 3 Â 3 password Â 3

password *password* 0|7 *encrypted-password*
no password

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password ' 3 Â
 0|7 ' 3 7 ~ 7 ~ 7 Â
encrypted-password ' 3 Â

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3 3 Â

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Ю 3 Ì '
 Ruijie(config)# **line vty 0**
 Ruijie(config-line)# **password red**

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login	ÿ Â

2.1.7 login

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

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

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

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

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password	③ Â

2.1.8 login local

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③ login local Â

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login local

no login local

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

```

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username	Â

2.1.9 login authentication

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```

login authentication default list-name
no login authentication default list-name

```

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```

default '
list-name ' ¼

```

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2.1.10 username

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username *name* **nopassword** **password** *password* **0|7**
encrypted-password

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

no username *name*

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name ' 1 Â
password ' 3 Â
0|7 ' 3 71 ~ 71 ~ 71 Â
encrypted-password ' 3 Â
privilege-level ' Â

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3 ~ 71 ì Â

ð Ô

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

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3	
login local	Â

2.1.11 lock

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

lock	В $\hat{A}$

--	--

/source-interface	ÿ
/vrf	

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

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Show session	,
exit	,

2.1.14 ip telnet source-interface

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ip telnet source-interface 3'

ip telnet source-interface interface-name

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interface-name' Э ÿ ,

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no ip telnet

source-interface 3 ÿ Â

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ip telnet source-interface *Loopback 1*

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telnet	√ ƒ '

2.1.15 enable service

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~ ~ ƒ enable service 3'

**enable service ssh-sesrver telnet-server web-server
snmp-agent**

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ssh-sesrver	6
telnet-server	6
web-server	6
snmp-agent	6

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ð Ô

3 6 ƒ Â **no enable service** 3
ƒ Â

ð Ô

ƒ' **enable service ssh-sesrver** ƒ'
Ruijie(Config~ # **enable service ssh-sesrver**

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3	
show service	ƒ '

2.2

ЛЮ 3'

- » 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

~ ↓ Л clock set ч

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

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hh:mm:ss ' ~ й ^ 8 ~ †

day ' ^ ~ ~ Â

month ' ^ ~ ~

year ' Ω ^ ~ ~ a Â

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exec-timeout *minutes seconds*

no exec-timeout

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minutes'

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seconds'

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

2.2.4 hostname

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3 **hostname**

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BeiJingAgenda(config)#

2.2.5 session-timeout

$\exists$
session-timeout $\exists \hat{A}$ no session-timeout $\exists \checkmark \checkmark \exists$ IO
 $\sim$ a $\hat{A}$
session-timeout *minutes seconds*
no session-timeout

ð Ò

```

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

```

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3	
clock set	

2.2.7 show running-config

```

> show running-config
running-config
show running-config

```

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2.2.8 show startup-config

```

> show startup-config
show startup-config

```

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ð Ò

```

> reload
Reload

```

2.2.9 reload

```

> reload
reload text in mmm hhh:mm[

```

```

in mmm hhh:mm '
at hh:mm month day year'
month '
day '
year '
cancel '

```

```

Ruijie#

```

```

Ruijie#

```

```

Ruijie# reload

```

```

Ruijie#

```

```

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

```

2.2.10 show reload

```

Ruijie# show reload

```

```

Ruijie#

```

```

Ruijie#

```

```

Ruijie#

```

```

Ruijie# show reload

```

```

Ruijie#

```

```

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 string
    }
    {
        string ' '
    }
    {
        {
            ^
        }
        {
            EXEC ^
        }
    }
}

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

```

```

no banner motd
banner motd c message c
c '
message '
no banner motd
no banner motd
no banner motd
no banner motd $ hello,world $
Ruijie(config)
Ruijie(config)# banner motd $ hello,world $

```

	no banner login	banner login
✓	✓	✓

⑧ ⑧

```

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

```

2.2.15 show line

~ Ю 3 show line ^

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

⑧ ⑧

```

console '      8 4
aux '
vty '
line-num '

```

⑧ 3 ⑧

⑧ ⑧

⑧ ⑧

3~ ^

⑧ ⑧

```

Ю
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

```


3 LINE

3.1 LINE

3.1.1 line

~ 100 3'

line console vty first-line last-line

δ Ô

console	8
vty	~
First-line	1
Last-line	1 Ey


```

Ruijie(config)# line vty 19
Ruijie(config)# line vty 10

```

3.1.3 transport input

```

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

```

all	
ssh	
telnet	
none	

```

default transport input

```

```

Ruijie# show running

```

```

~

```

```

Ruijie# default transport input telnet
Ruijie# no transport input telnet
Ruijie#

```

```

Ruijie#

```

```

Ruijie#

```

```

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

```

```

Ruijie#

```

```

Ruijie#

```

3	
show running	Â

4

4.1

```
        y        Ю        }        ^
,        ~        ' copy xmodem }
,        ~        ' copy tftp  }
```

4.1.1 copy xmodem

```
        ~        }~
        Э        Ю        ^
copy flash filename xmodem
copy xmodem flash filename

д        ô
filename '        Э        ^

д        ô
        ^

д        }        ô

д        ô
        П        ~        ^        ~        ^
        ↓Л        ^        ~        y        ^        ^
        ^        ^        ^        ^        ^
        Ю        y y        ^        ^
        γ        Э        ^        y        ^
        ~
~
        ^        ~        ^        П        Э        Л        ^
copy xmodeam flash:        copy flash:
~

д        ô
        Ю        Э        Ю        ^
Ruijie# copy xmodem flash: config.text
```

~ }

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

ø } Ô

~ }

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

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5.1

É ¼ 3'

- » ping
- » traceroute
- » line-detect

5.1.1 ping

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

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vrf-name	↓
ip-address	Á
length	
times	
data	'↓
source	

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```
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
```

```
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

$$\{ \checkmark \} \cup \{ \checkmark \} \quad \checkmark$$

```
tracert vrf vrf-name ip ip-address ip-address probe number
source source-address timeout seconds ttl minimum maximum
```

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<i>vrf-name</i>	↓

<i>ip-address</i>	Â
<i>number</i>	
<i>source-address</i>	
<i>seconds</i>	
<i>minimum maximum</i>	

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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
```

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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#

```

ÿ  Э          ~  ↓  Л          ~  ÿ          ^  .  ~  ~  ÿ
                ÿ  ~
                Â

```

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

3 ~ ↓ Л

Â

6

6.1

ЛЮ 3'

```
, interface aggregateport
, interface giagbitEthernet
, interface tenGi<007A>Tj/TT0 1 Tf0.749 0 Td( )Tj/TT1 1 Tf-0.0005 Tc 0.0027 2s0.32
```

show interfaces show
 interfaces aggregateport 3

ð Ô

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

ð 3 Ô

3	
show interfaces	Â

6.1.2 interface giagbitEthernet

interface gigabitEthernet *mod-num/port-num*

ð Ô

mod-num/port-num ' 1 2 1~
 ā Â

ð 3 Ô

ð Ô

no a Â show interfaces
 show interfaces gigabitEthernet 3

ð Ô

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

ð 3 Ô

3	
show interfaces	Â

6.1.3 interface vlan

interface vlan *vlan-id*

```

no interface vlan $vlan-id

Ruijie(config)# show interfaces
Ruijie(config-if)# show interfaces vlan $vlan-id

Ruijie(config)# interface $interface
Ruijie(config-if)# no medium-type
Ruijie(config-if)# medium-type fiber | copper
Ruijie(config-if)# no medium-type

Ruijie(config-if)# show interfaces
Ruijie(config-if)# show interfaces $interface
Ruijie(config-if)# show interfaces $interface $vlan-id

Ruijie(config)# interface gigabitethernet $slot/$port

```

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

```
Ø 3 Ø
```

3	
show interfaces	Â

```
Ø 1 Ø
```

```
a
    ||
    Â
```

6.1.5 description

```
1 Â 3
```

```
description string
```

```
no description
```

```
Ø Ø
```

```
string ' 1 Â
```

```
Ø Ø
```

```
1 Â
```

```
Ø 3 Ø
```

```
Ø Ø
```

```
show interfaces 3 ~ 1 Â
```

```
Ø Ø
```

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

```
Ruijie(config-if)# description GBIC-1
```

```
Ø 3 Ø
```

3	
show interfaces	Â

6.1.6 shutdown

```
~ 3 Â 3 no
```

shutdown

no shutdown

ð ʒ Ô

ð Ô

è ^ ъ ã ã ~ ~ ʒ ~
ÿ ã a Â

```

auto
    ð      Ô
        Â
ð   ¿   Ô
    ð      Ô
        ¯   ~   ↓ ∪
            a     Â           a ↓~           #       Â
show interfaces ¿   Â   a ↓~           ì       Â
a ↓ Â ~
ð      Ô
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# speed 100
ð      ¿   Ô

```

¿	
show interfaces	Â

6.1.8 duplex

		Ю	З	Л	А	З	но
		И					
		duplex	auto	full	half		
		no duplex					
д	О						
		auto	Л	Л	А		
		full	Л	А			
		half	Л	А			
д	О						
			Л	Л	А		
д	З	О					
д	О						

3

↓ 6 Â ↓ 几 show interfaces 3
↓ Â

ð Ô

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

ð 3 Ô

3	
show interfaces	Â

6.1.9 flowcontrol

3 8 Â 3 ÿ

flowcontrol auto off on

no flowcontrol

ð Ô

auto 8 Â

off ' 8 Â

on ' 8 Â

ð Ô

8 Â

ð 3 Ô

ð Ô

show interfaces 8 8 Â

ð Ô

" 几 8 '

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

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

ð 3 Ô

3	
show interfaces	Â

6.1.10 mtu

		Mtu num		
đ	ô			
		num'		a ↓ a ↓
đ	ô			
		Â		
đ	đ	ô		
đ	ô			
			^	~ Â ↓
đ	ô			

clear interface *interface-id*

ð Ô

interface-id ' 11 Â

ð 3 Ô

ð Ô

3 4

Â

3

shutdown no shutdown 3 Â

ð Ô

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

ð 3 Ô

no ss

3

6.1.16 switchport access

3 5 access port 5 5

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

8 8

vlan-id 5 5

8 8

5 5 5

8 8

8 8

5 5 5 5 5

8 8

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

8 8

3	
switchport mode	5 5 5 5
switchport trunk	5

--	--

allowed vlan
vlan-list

}<"Àœ0

$$\vec{O} \qquad \vec{O}$$

6.1.18 snmp trap link-status

Ồ Ô

$$\tilde{O} \quad \mathfrak{z} \quad \hat{O}$$

Ồ Ô

Ồ Ô

$$\partial \quad \quad \quad \partial$$

3	
snmp trap link-status	тл
no snmp trap link-status	тл

6.2

6.2.1 show interfaces

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

д ô
interface-id ' ^ л à à à

counters ' Â
description ' ~ Â
status ' γ ~ à √ Â
switchport ' γ ~ √ γ Â
trunk ' ~ à Â

д ô
 Â

д 3 ô

д ô

а тл ~ Â

д 3 ô

interface aggregateport	~ Â
interface vlan	 ^ ~ ~ ~ Â
shutdown	~ Â 3
speed	Â
switchport priority	"1 Â
switchport protected	ñ Â

7 Aggregate Port

7.1

7.1.1 port-group

й Â 3

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

ð Ô

a

ð Ô

<i>port-group-number</i>	Λ~
	Λ

ð 3 Ô

ð Ô

а ↓ ↓ ~ Â

ð Ô

Ю Лу ,
 Ruijie(config)# **interface gigabitethernet 1/3**
 Ruijie(config-if)# **port-group 3**

7.1.2 aggregateport load-balance

й Â 3

aggregateport load-balance **dst-mac** **src-mac** **src-dst-mac**
dst-ip **src-ip** **src-dst-ip**

no aggregateport load-balance

δ

Ô



dst-mac

8 LACP

8.1

8.1.1 lacp port-priority

"l Â 3 Â

lacp port-priority *port-priority*

no lacp port-priority

<i>port-priority</i>	"l Â 3 ỳ	

"l ỳ Â

3 Â

3 "l "l "l ỳ ỳ
3 ̄ "l ỏ

8.1.2 port-group mode

Л Â 3 √

б Â

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

no port-group

<i>Key</i>	√ a √ √ Â a √
active	ŷ Â
passive	a ŷ √ б

a б Â

3 Â

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

Ruijie(config-if)# **port-group 1 mode active**

3
lacp port-priority

	<i>port-priority</i>	"l Â √ ò

	"l ò Â
--	--------

3	Â
---	---

	"l "l "l "l ò ŷ
	√ ā "l Â

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

	3	
3	port-group key mode active passive	
	port-group key mode	Â

√	
---	--

3 √	∏	

8.1.4 lacp system-priority

"l Â 3 Â

lacp system-priority *system-priority*

no lacp system-priority

	<i>system-priority</i>	"l ~ 0-65535 Â

}

Â

"1 '

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

}

Local information:

		LACP port		Oper	Port	Port
Port	Flags	State	Priority	Key	Number	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:

		LACP port		Oper	Port	Port
Port	Flags	Priority	Dev ID	Key	Number	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
				Â		
				Â		
				, !		
				, ŷ Â		
				, ' l L		
				, Â		

9 VLAN

9.1

9.1.1 vlan

$$\{ \hat{A} \} \quad \{ \hat{A} \} \quad \{ \hat{A} \}$$

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

Ồ Ô

<i>vlan-id</i>	$\hat{A}$

Ô 3 Ô

Ồ Ô

```
end } Ctrl+C ^
exit }
```

Ồ Ô

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

$$\hat{O} \quad \hat{O}$$

3	
show vlan	Â

9.1.2 name

$\hat{A}$ $\hat{B}$

name *vlan-name*
no name

ð Ô

<i>vlan-name</i>	↓

ð Ô

↓

ð 3 Ô

ð Ô

show vlan 3

ð Ô

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

ð 3 Ô

3	
show vlan	Â

9.1.3 switchport mode

3 Y ^ ~ ~ ↓ √ ÿ
 ÿ ÿ Â 3
 ÿ Â

switchport mode access trunk
no switchport mode

ð Ô

access	ÿ Â
trunk	ÿ Â

ð Ô

Ruijie(config-if)# **switchport access vlan** *vlan-id*
 Ruijie(config-if)# **switchport mode** *access*
 Ruijie(config-if)# **switchport mode** *trunk*
 Ruijie(config-if)# **switchport trunk native vlan** *vlan-id*
 Ruijie(config-if)# **switchport trunk allowed vlan** *list*
 Ruijie(config-if)# **switchport trunk pruning** *pruning*

8. 配置

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

9. 配置

配置	说明
switchport access	配置接口为 access 模式，并指定 VLAN ID
switchport trunk	配置接口为 trunk 模式，并指定 VLAN ID

9.1.4 switchport access

Ruijie(config-if)# **switchport access vlan** *vlan-id*
 Ruijie(config-if)# **no switchport access vlan**

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

8. 配置

配置	说明
switchport access	配置接口为 access 模式，并指定 VLAN ID
no switchport access	取消配置接口为 access 模式，并指定 VLAN ID

9. 配置

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

10. 配置

11. 配置

Ruijie(config-if)# **switchport mode** *trunk*
 Ruijie(config-if)# **switchport trunk native vlan** *vlan-id*
 Ruijie(config-if)# **switchport trunk allowed vlan** *list*
 Ruijie(config-if)# **switchport trunk pruning** *pruning*

ð Ô

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

ð 3 Ô

3	
switchport mode	γ ^ ~ Â
switchport trunk	ÿ ↓ Â

9.1.5 switchport trunk

ÿ Â 3 no ÿ Â

```
switchport trunk allowed vlan all add remove except
vlan-list native vlan vlan-id
```

```
no switchport trunk allowed vlan native vlan
```

ð Ô

allowed vlan <i>vlan-list</i>	↓ ÿ Â ↓ ÿ ≠ ↓ ÿ ~ ÿ ~ ÿ ~ ^ ~ ÿ Â ' Â ↓ ÿ ^ ~ ÿ ' Â ÿ ↓ ↓ ÿ ↓ ↓ ÿ ↓ ÿ ↓
native vlan <i>vlan-id</i>	Â

ð Ô

↓ ~

ð 3 Ô

show vlan id *vlan-id*

ð Ô

<i>vlan-id</i>	1 Â

ð Ô

ð 3 Ô

ð Ô

~ end 3~ Ctrl+C Â
~ exit 3

ð Ô

```
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
```

ð 3 Ô

3	
name	1 Â
switchport access	71 Â

10 Super-vlan

10.1

10.1.1 supervlan

3 5 supervlan 6

supervlan

no supervlan

8 3 6

8 6

~ end 3~ Ctrl+C 6

~ exit 3

8 6

Ruijie(config)# **vlan 3**

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

8 3 6

3	
show supervlan	6

10.1.2 subvlan

3 6

subvlan *vlan-id-list*

no subvlan *vlan-id-list*

8 6

<i>Vlan-id-list</i>	7

8 3 6

Ø Ô

no subvlan

Ø Ô

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

Ø 3 Ô

3	
---	--

show supervlan	^
----------------	---

10.1.4 proxy-arp

3

3

π

^

proxy-arp

no proxy-arp

δ 3 Ô

δ Ô

~

end

3~

Ctrl+C

^

~

exit

3

δ Ô

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

δ 3 Ô

3	
show supervlan	^

10.2

10.2.1 show supervlan

3

è

^

show supervlan

show supervlan id *vlan-id*

δ Ô

<i>vlan-id</i>	

δ 3 Ô

δ Ô

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 ' *num*

④ ⑤

④ ③ ⑤

④ ⑤

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

④ ③ ⑤

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

④ ⑤

num

id ~

④ ③ ⑤

④ ⑤

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

④ ③ ⑤

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

11.2

④ **show protocol-vlan**

11.2.1 show protocol-vlan

show vlan protocol-vlan

0 0

0 3 0

0 0

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

Ï

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

ð Ô

```
community ' ' Ï  
isolated ' ' Ï  
primary ' ' Ï  
no ' '
```

ð Ô

ð ¶ Ô

ð Ô

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

ð ¶ Ô

```
show vlan private-vlan
```

12.1.2 private-vlan association

```
private-vlan association svlist add svlist remove svlist
no private-vlan association
```

```
Ø      Ô
```

```
svlist ' ñ
```

```
no ' √      6
```

```
Ø      Ô
```

```
Ø 3 Ô
```

```
Ø      Ô
```

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

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

```
Ø 3 Ô
```

```
show vlan private-vlan
```

12.1.3 private-vlan mapping

```
private-vlan mapping svlist add svlist remove svlist
no private-vlan mapping
```

```
Ø      Ô
```

```
svlist ' 
```

```
no ' 
```

```
Ø      Ô
```

```
Ø 3 Ô
```

```
Ø      Ô
```

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

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

```
Ø 3 Ô
```

show vlan private-vlan

12.1.4 switchport mode private-vlan

↵

switchport mode private-vlan host promiscuous
no switchport mode

ð Ô

host ' Ÿ
promiscuous '
no '

ð Ô

ð 3 Ô

ð Ô

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

ð 3 Ô

show vlan private-vlan

12.1.5 switchport private-vlan host-association

Ÿ

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

ð Ô

p_vid '
s_vid '
no : Ÿ Ÿ

ð Ô

ð 3 Ô

Ồ Ô

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

$$\partial \quad \quad \quad \partial$$

```
show vlan private-vlan
```

12.1.6 switchport private-vlan association trunk

switchport private-vlan association trunk p_vid s_vid

no switchport private-vlan association trunk p_vid s_vid

Ồ

p_vid '
s_vid '
no : $\ddot{y}$ $\ddot{y}$

Ồ Ô

$$\tilde{O} \quad \{ \quad \hat{O}$$

Ồ Ô

```
Ruijie(config)# interface gigabitEthernet 0/1
Ruijie(config-if)# switchport mode
Ruijie(config-if)# switchport private-vlan associatio
n trunk 22 23
```

$$\vec{O} \quad \quad \quad \vec{O}$$

```
show vlan private-vlan
```

Ồ Ạ Ô

ЛЭ

12.1.7 switchport private-vlan mapping

```
switchport private-vlan mapping p_vid svlist add svlist remove
svlist
```

```
no switchport private-vlan mapping
```

```
Ø      Ô
```

```
p_vid '
svlist '
no ' ↓
```

```
Ø      Ô
```

```
Ø  3  Ô
```

```
Ø      Ô
```

```
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
```

```
Ø      3 Ô
```

```
show vlan private-vlan
```

12.2

```
show vlan private-vlan
```

12.2.1 show vlan private-vlan

```
show vlan private-vlan community primary isolated
```

```
Ø      Ô
```

```
primary '
community '
isolated '
```

```
Ø      Ô
```

⑧ ③ ①

⑧ ①

```
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
```

⑧

⑧ ①

```
no '
```

⑧ ①

⑧ ③ ①

⑧ ①

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

12.3.2 switchport hybrid native vlan

```
switchport hybrid native vlan vid  
no switchport hybrid native vlan
```

⑧ ①

```
no '
```

⑧ ①

⑧ ③ ①

⑧ ①

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

12.3.3 switchport hybrid allowed vlan

```
switchport hybrid allowed vlan add tagged | untagged | remove  
list
```

```
no switchport hybrid allowed vlan
```

⑧ ①

```
no '
```

⑧ ①

⑧ ③ ①

⑧ ①

```
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

¶

switchport mode dot1q-tunnel
no switchport mode

ð Ô

no

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ð ¶ Ô

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

đ 3 Ô

show vlan

13.1.2 switchport mode uplink

đ

switchport mode uplink

```

no ' '
    0 0
        ~
    0 3 0

    0 0

        Ю                й ~
Ruijie(config)#interface gigabitEthernet 0/1
Ruijie(config-if)#switchport dot1q-tunnel allowed vlan
tagged 3-6
Ruijie(config)#end

    0 3 0

show interface dot1q-tunnel

```

13.1.4 switchport dot1q-tunnel native vlan

```

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

    0 0

vid

no'        й

    0 0

        й

    0 3 0

    0 0

        Ю                й

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

    0 3 0

show interface dot1q-tunnel

```

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⑧ ⑥

```

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

```

⑧ ③ ⑥

```
show translation-table interface intf-id
```

13.1.7 traffic-redirect access-group acl outer-vlan

```

traffic-redirect access-group acl outer-vlan vid in
no traffic-redirect access-group acl outer-vlan

```

⑧ ⑥

```

acl ' ⑦
vid ' ⑧
no ' ⑨

```

⑧ ⑥

⑧ ③ ⑥

⑧ ⑥

```

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
```

```
Ø 3 Ø
```

```
show traffic-redirect
```

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

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

```
Ø Ø
```

```
acl ' 7
```

```
vid ' 1
```

```
no' 1
```

```
Ø Ø
```

```
Ø 3 Ø
```

```
Ø Ø
```

```
Ю 11 11
```

```
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
```

```
Ø 3 Ø
```

```
show traffic-redirect
```

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

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

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```
acl '      7
```

```
vid '      77
```

```
no '  7      77
```

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```
Ю      ð      77      ð
```

```
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
```

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```
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
```

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```
show frame-tag tpid
```

```

gvrp '
no ' ✓

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Ruijie#configure
Ruijie(config)# l2protocol-tunnel stp
Ruijie(config)# l2protocol-tunnel gvrp
Ruijie(config)#end

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show l2protocol-tunnel gvrp|stp

```

13.1.13 l2protocol-tunnel *proto-type* enable

```

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l2protocol-tunnel stp gvrp enable
no l2protocol-tunnel stp gvrp enable

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stp '
gvrp '
no ' ✓

δ 3 Ô

δ Ô

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

δ 3 Ô

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**

⑧ ①

```
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

⑧ ① **show frame-tag tpid interface *intf-id***

⑧ ①

intf-id '

⑧ ①

a

⑧ ③ ①

⑧ ①

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

13.2.4 show inner-priority-trust

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show inner-priority-trust

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a 8

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⑧ ①

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

```

-----
Gi0/1  enable

```

13.2.5 show registration-table

¶

show registration-table interface *intf-id*

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intf-id '

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```

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

```

13.2.6 show translation-table

show translation-table interface *intf-id*

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intf-id '

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```

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

```

13.2.7 show traffic-redirect

↓ ↱

show traffic-redirect interface *intf-id*

⑧ ①

intf-id '

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⑧ ③ ①

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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

Y

show l2protocol-tunnel gvrp|stp

⑧ ①

gvrp '

stp '

⑧ ①

⑧ ③ ①

⑧ ①

Ruijie# **show l2protocol-tunnel stp**

L2protocol-tunnel: Stp Enable

Ruijie# **show l2protocol-tunnel gvrp**

L2protocol-tunnel: gvrp Disable

14 MAC

14.1

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- , 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

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mac-address-table aging-time *seconds*

no mac-address-table aging-time

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seconds ' || ~ Л ÿ Æ Â ã Â

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show mac-address-table aging-time 3 Â

show mac-address-table dynami 3 || Â

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

ð

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

?

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

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↓ ↲ **show mac-address-table static** ?

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# a
ss-table static
ble static
show mac-address-table static
clear mac-address-table static

```

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```

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

```

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ð	
show mac-address-table static	Â
clear mac-address-table static	Â

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

```

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mac-address	Â
vlan vlan-id	~ ã Â

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

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

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show mac-address-table notification	Â
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14.1.9 address-bind

address-bind *ip-address mac-address*

no address-bind *ip-address*

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

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

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ð	
show address-bind	

14.1.10 address-bind uplink

address-bind uplink *intf-id*

no address-bind uplink *intf-id*

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<i>intf-id</i>	,	й
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Ruijie(config)#**address-bind uplink** *fa0/1*

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?	
show address-bind uplink	

14.1.11 address-bind install

address-bind install

no address-bind install

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

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,	?	,
show address-bind uplink		,

14.1.12 address-bind ipv6-mode

address-bind ipv6-mode compatible

address-bind ipv6-mode loose

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address-bind ipv6-mode strict

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```
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

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

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	›
address <i>mac-addr</i>	› MAC Â
interface <i>interface-id</i>	› /1
vlan <i>vlan-id</i>	› VLAN /1

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

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›	
---	--

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

14.2.2 show mac-address-table aging-time

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show mac-address-table aging-time

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Ruijie# show mac-address-table aging-time

Aging time : 300

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mac-address-table aging-time	- Â

14.2.3 show mac-address-table count

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show mac-address-table count

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Ruijie# show mac-address-table count

Dynamic Address Count : 51

Static Address Count : 0

Filter Address Count : 0

Total Mac Addresses : 51

3

```
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
```

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3	
clear mac-address-table dynamic	Â

14.2.5 show mac-address-table filtering

```
show mac-address-table static addr mac-addr vlan vlan-id
```

δ Ô

mac-addr	Â

--	--

<i>mac-addr</i>	Â
<i>vlan-id</i>	Â
<i>interface-id</i>	↓ ∪

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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

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

14.2.9 show mac-address-table vlan

Â

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

ð Ô

<i>vlan-id</i>	Â

ð 3 Ô

ð Ô

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

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

3 3 0

3 0

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

3 3 0

3	
mac-manage-learing uniform	3 3 3
mac-manage-learning uniform learning-synchronization	3 3 3
mac-manage-learning dispersive	3 3 3

15 DHCP Snooping

15.1 DHCP snooping

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- » 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

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no ip dhcp snooping

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П 1~ ↓ Л show ip dhcp snooping
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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)

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w ip dhcp snooping	

Ip dhcp snooping vlan

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ip dhcp snooping	

15.1.3 ip dhcp snooping bootp-bind

```

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	

15.1.4 ip dhcp snooping verify mac-address

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no ip dhcp snooping verify mac-address

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```

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)
-----

```

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⑧	
show ip dhcp snooping	

15.1.6 ip dhcp snooping database write-delay

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⑧ ⑧

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```

ip dhcp snooping database write-delay time
no ip dhcp snooping database write-delay

time ' 4

```

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

15.2 DHCP snooping

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- , ip dhcp snooping suppression
- , ip dhcp snooping trust
- , ip dhcp snooping limit rate

15.2.1 ip dhcp snooping suppression

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no ip dhcp snooping suppression

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Ю **fastethernet 0/2** й '

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Ю fastethernet 0/1 ñ

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

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show ip dhcp snooping	

15.2.3 ip dhcp snooping limit rate

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show ip dhcp snooping

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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

8 3 0

3	
ip dhcp snooping binding	
clear ip dhcp snooping binding	

16 IGMP Snooping

16.1

```

{
    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

```

"l      IO      8      Â      ~
      ~      Â      3      3~
      ~      Â
ip igmp profile profile-number

```


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

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

$$\partial \quad \quad \quad \partial$$

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ip igmp profile	
deny	ì ì
permit	ì ì

16.1.3 deny

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deny

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16.1.5 ip igmp snooping ivgl

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

1. ip
 2. ip
 3. ip
 4. ip
 5. ip
 6. ip
 7. ip
 8. ip
 9. ip
 10. ip
 11. ip
 12. ip
 13. ip
 14. ip
 15. ip
 16. ip
 17. ip
 18. ip
 19. ip
 20. ip
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 22. ip
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 81. ip
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 83. ip
 84. ip
 85. ip
 86. ip
 87. ip
 88. ip
 89. ip
 90. ip
 91. ip
 92. ip
 93. ip
 94. ip
 95. ip
 96. ip
 97. ip
 98. ip
 99. ip
 100. ip

Ruijie(config)# ip igmp snooping ivgl

1. ip
 2. ip
 3. ip
 4. ip
 5. ip
 6. ip
 7. ip
 8. ip
 9. ip
 10. ip
 11. ip
 12. ip
 13. ip
 14. ip
 15. ip
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 96. ip
 97. ip
 98. ip
 99. ip
 100. ip

ip	
ip igmp snooping svgl	
ip igmp snooping ivgl-svgl	

16.1.6 ip igmp snooping svgl

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


```
Ruijie(config)#
```

ip igmp snooping vgl	
----------------------	--

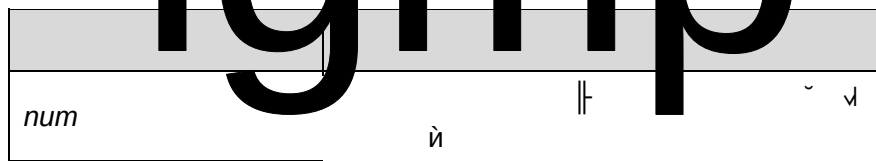
16.1.9 ip igmp snooping vlan

ip igmp snooping vlan $\hat{A}$

π $\hat{A}$

ip igmp snooping vlan *num*

no ip igmp snooping vlan *num*



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

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num

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16.1.13 ip igmp snooping vlan mrouter interface

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

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3	
ip igmp snooping source-check port	

16.1.14 ip igmp snooping vlan static interface

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```
ip igmp snooping vlan static interface ^
^
```

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

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vid	^
address	^
interface-id	^

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

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3	
ip igmp snooping vlan mrouter interface	

16.1.15 ip igmp snooping fast-leave enable

3 ip igmp

snooping fast-leave enable

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

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Ruijie(config)# ip igmp snooping fast-leave

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16.1.16 ip igmp snooping suppression enable

3 ip igmp

snooping suppression enable

ip igmp snooping suppression enable

no ip igmp snooping suppression enable

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Ruijie(config)# ip igmp snooping suppression

0 3 0

16.1.17 ip igmp snooping source-check port

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3 ip igmp

snooping source-check port Â 3

11 Â

ip igmp snooping source-check port

no ip igmp snooping source-check port

0 0

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0 0

11 Â

0 3 0

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3	
---	--

0 3 0

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0 0

0 0

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

0 3 0



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ip igmp profile	

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3	
ip igmp snooping filter	

- › **show ip igmp snooping gda-table interface mrouter**
- › **show ip igmp profile *profile-number***
- › **debug igmp-snp**

16.2.1 show ip igmp snooping

Â

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

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gda-table	Y
interfaces	Y IO
mrouter	
statistics	

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IO 3 4 ' **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)

0 3 Ô

16.2.2 show ip igmp profile

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show ip igmp profile

show ip igmp profile *profile-number*

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	Â
<i>profile-number</i>	

0 Ô

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

Profile 1

Permit

range 224.0.1.0, 239.255.255.255

0 3 Ô

16.2.3 clear ip igmp snooping gda-table

|| ~ Â

0 Ô

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

ð Ô

event	Y ⁺
packet	
msf	6
warning	

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17.1 PIM-Snooping

17.1.1 ip pim snooping

17.1.2 ip pim snooping

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d  3    O

d      O

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

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          A
-----

```

17.1.3 show ip pim snooping

```

~ show ip pim snooping

3 A
show ip pim snooping

d  3    O

          A
          A

d      O

      Ю  3

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

show ip pim snooping

vlan interface-number 3 A

show ip pim snooping vlan *interface-number*

0 0

<i>interface-number</i>	

0 3 0

0 0

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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

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

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```
show spanning-tree interface ^
```

18.1.4 spanning-tree link-type

a ^ ↓Л 3
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```
spanning-tree link-type point-to-point shared
no spanning-tree link-type
```

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```
point-to-point ' 8 й
shared ' 8 й
```

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↓ й
```

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

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```
show spanning-tree interface
```

18.1.5 spanning-tree max-hops

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^ ↓Л 3 ^

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

no spanning-tree max-hops

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hop-count ' .

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hop-count

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```

show'                               Â
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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 Vlan Mapped
-----
0        1-2,4,11-4094
1        3,5-10
-----
Ruijie(config-mst)# exit
Ruijie(config)#

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

~   Ю'

Ruijie(config-mst)# no instance 1

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δ   ∩ Ô

```

```

show spanning-tree mst '
instance instance-id vlan vlan-range '   ¶

name '   ↓
revision '   ∟
show '   Ю

```

18.1.8 spanning-tree mst cost

```

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```

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

no spanning-tree mst *instance-id* cost

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instance-id ' 1~ й '

cost ' ~ й ~ ~

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

Ruijie(config-if)# **spanning-tree mst 3 cost 400**

≠ ↓Л show spanning-tree mst interface interface-id 3
Э

δ 3 Ô

show spanning-tree mst ' Â

spanning-tree mst port-priority ' "l

spanning-tree mst priority ' й "l

18.1.9 spanning-tree mst port-priority

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"l ~

Â ↓Л 3 Â

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

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

Instance-id 'Λ' 'η'
priority '1' '↓' '↓' '↓' '↓' '↓' '↓' '↓' '↓' '↓' '↓'

0 3 0

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

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priority '          "l ~ ↓
          Â          ~      ñ
```

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```
instance-id          ñ
priority            ñ
```

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```
Ю          "l      ñ      '
Ruijie(config-if)# spanning-tree mst 20 priority 8192
↓Л      show spanning-tree mst instance interface interface-id
3      Э
```

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```
show spanning-tree mst '          Â
spanning-tree mst cost '
spanning-tree mst port-priority '  a ↓          "l
```

18.1.11 spanning-tree reset

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```
spanning-tree reset
```

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

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```
show spanning-tree '          Â
show spanning-tree interface '      Â
```

18.1.12 spanning-tree tx-hold-count

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A

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

Ruijie(config-if)#

tx-hold-count ' A y A

Ruijie(config-if)#

A

Ruijie(config-if)#

A

Ruijie(config-if)#

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

Ruijie(config-if)#

show spanning-tree ' A

18.1.13 spanning-tree pathcost method

A

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spanning-tree pathcost method long short**no spanning-tree pathcost method**

Ruijie(config-if)#

long ' A**short** ' A

Ruijie(config-if)#

A

Ruijie(config-if)#

A

Ruijie(config-if)#

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

Ruijie(config-if)#

show spanning-tree interface ' A

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show spanning-tree interface

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

```
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```

```
show spanning-tree interface      Â
```

18.1.18 spanning-tree tc- protection

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```

```
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```

```
spanning-tree tc- protection
```

```
no spanning-tree tc- protection
```

```
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```
Ø 3 Ø
```

```
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```
Ø      Ø
```

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

18.1.19 spanning-tree tc-protection tc-guard

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```

```
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```

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```

```
spanning-tree tc-protection tc-guard
```

```
no spanning-tree tc-protection tc-guard
```

```
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```
Ø      Ø
```

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

18.1.20 spanning-tree tc-guard

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```

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```

spanning-tree tc-guard

no spanning-tree tc-guard

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

18.1.21 spanning-tree guard root

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spanning-tree guard root

no spanning-tree guard root

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

18.1.22 spanning-tree loopguard default

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spanning-tree loopguard default

no spanning-tree loopguard default

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

spanning-tree autoedge disabled

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disabled

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

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18.2

18.2.1 show spanning-tree

spanning-tree max-hops '

spanning-tree tx-hold-count '

Â

18.2.2 show spanning-tree interface

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00AE016F612D18

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Ruijie# show spanning-tree mst configuration

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spanning-tree mst configuration '

spanning-tree mst cost '

spanning-tree mst max-hops '

spanning-tree mst priority ' "1

spanning-tree mst port-priority ' "1

19 SPAN

19.1 monitor session

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

ð Ô

<i>session_number</i>	1 1
source interface <i>interface-id</i>	1 1 <i>interface-id</i> 1 1 1 1
destination interface <i>interface-id</i>	1 1 <i>interface-id</i> 1 1 1 1
both acl name	1 1 acl name/id
rx	1 1
tx	1 1
all	
encapsulation	1 1 1 1
switch	1 1 1 1

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show monitor

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20 RSPAN

20.1

20.1.1 monitor session

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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

ð Ô

<i>session-num</i>	1
<i>vlan-id</i>	remote span vlan id
<i>Interface-name</i>	1

ð 3 Ô

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~ **end** 3~ Â

~ **exit** 3

ð Ô

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**

21 IP

21.1

ЛЮ 3'

- ip address
- ip unnumbered

21.1.1 ip address

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3 Ю'

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

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<i>interface-number</i>	<i>N</i>
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```
ip unnumbered fastEthernet 0/1
```

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show interface	

21.2

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- › arp
- › arp retry interval
- › arp retry times
- › arp trusted NUM
- › arp trusted aging

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

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clear arp-cache	ǎ

21.2.2 arp retry interval

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<i>number</i>	↓ ㄴ ↓ ↓ ẽ

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```
arp trusted 1000
```

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service trustedarp	√ π

21.2.5 arp trusted aging

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$\tilde{e}$

arp trusted aging

no arp trusted aging

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↓ ∪ Ю arp timeout 3 è

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service trustedarp	↓ π

21.2.6 arp unresolve

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↓ ↓ ð ð

arp unresolve *number*
no arp unresolve

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<i>number</i>	↓ ð ð ð

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arp unresolved 500

21.2.7 arp gratuitous-send interval

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arp gratuitous-send interval *seconds*
no arp gratuitous-send

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seconds	~ Å ~ √

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

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

21.2.8 arp timeout

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arp timeout seconds

no arp timeout

ð Ô

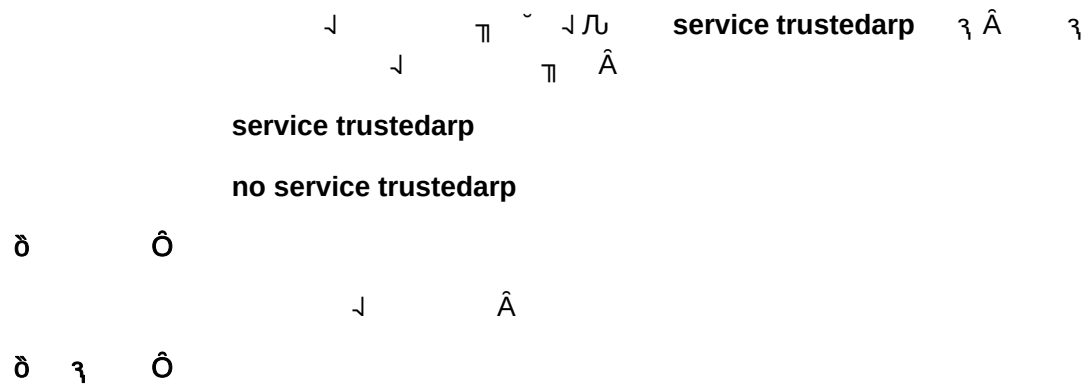
seconds	~ Л й Å

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21.2.10 service trustedarp



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

21.4 IP

<i>ip</i>	~
<i>ip mask</i>	
<i>mac-address</i>	
static	
complete	

incomplete

||

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Люй

Ruijie# show arp

Total Numbers of Arp: 7

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

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Лю

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
```

Решение **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
```

Решение **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

show arp counter

Вопрос

Ответ

Решение **show arp counter**

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

21.4.4 show arp detail

Анализ решения

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>	б γ
vrf <i>vrfname</i>	
<i>ip</i>	~
<i>ip mask</i>	
<i>mac-address</i>	
static	
complete	-
incomplete	-
trusted	√

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Решение **show ip arp**

Ruijie# **show ip arp**

Protocol	Address	Age(min)	Hardware	Type
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			

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Interface-type

Interface-number

1

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22 IP

22.1 IP

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- › **ip mask-reply**
- › **ip mtu**
- › **ip redirects**
- › **ip source-route**
- › **ip unreachable**

22.1.1 ip mask-reply

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ip mtu bytes

no ip mtu

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interface fastEthernet 0/1

ip mtu 512

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interface fastEthernet 0/1
no ip redirects

22.1.4 ip source-route

source-route А 3 П А 3 ip

ip source-route

no ip source-route

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no ip source-route

23 DHCP

23.1 DHCP

Другие опции:

- 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

Если опция не задана, то клиент будет использовать файл `bootfile` по умолчанию. Если опция задана, то клиент будет использовать файл `bootfile` с именем `file-name`.

no bootfile

Описание

<i>file-name</i>	ИИ ° ∫ Â

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 ИИ Â next-server ∫

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 bootfile router.conf

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∫	
ip dhcp pool	ИИ ∫ ° Â
next-server	Â Ю ∫

23.1.2 client-identifier

ИИ ∫ ∫ client-identifier Â ∫ no ∫ ∫
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client-identifier *unique-identifier*
no client-identifier

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<i>unique-identifier</i>	° ∫ ∫ ∫ ∫ Â

 client-name DHC

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default-router 192.168.12.1

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ip dhcp pool	ИИ ↓ А

23.1.5 dns-server

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dns-server А з no ↓ Л Е ИИ А з

dns-server *ip-address ip-address2...ip-address8*

use-dhcp-client *interface-type interface-number*

no dns-server

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<i>ip-address</i>	ИИ Е А
<i>ip-address2...ip-address8</i>	^ ↓ ~ ↓ Л Е А
use-dhcp-client <i>interface-type</i> <i>interface-number</i>	↓ Е й Е А

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[illegible]

```
dns-server 192.168.12.3
```

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

no

domain-name *domain-name*

no domain-name

<i>domain-name</i>	ℙ ℙ ℙ ℙ

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$$\tilde{y} = \frac{\lambda}{\lambda + \lambda^*} \hat{A}$$

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hardware-address 00d0.f838.bf3d

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client-identifier	№ Ω 8 ~ Â ъ
host	№ Â
ip dhcp pool	№ ↓ ~ Â

23.1.8 host

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host *ip-address netmask*

no host

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<i>ip-address</i>	№ ъ Â
<i>netmask</i>	№ ъ Â

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№ ъ Â

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client-identifier	$\text{client-identifier} = \text{client_id} \parallel \text{client_mac_addr} \parallel \text{client_ip_addr}$
hardware-address	$\text{hardware-address} = \text{client_mac_addr}$
ip dhcp pool	$\text{ip dhcp pool} = \text{client_ip_addr}$

ip address dhcp
no ip address dhcp

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interface fastEthernet 0
ip address dhcp
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dns-server	17 1

ip dhcp pool	no ip dhcp excluded-address
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23.1.10 ip dhcp excluded-address

no ip dhcp excluded-address **no**

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3 ip dhcp ping timeout Â

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ip dhcp ping timeout *milli-seconds*

no ip dhcp ping timeout

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milli-seconds

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pool-name	↓ ⅃ ˆ

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Ruijie(dhcp-config)#

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ip dhcp pool mypool0

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host	⅃ ˆ
ip dhcp excluded-address	⅃ ⅃ a ↓ ˆ

<i>days</i>	⌈ ⌋ ~ ∪ ∩ ∅ ∅̂
<i>hours</i>	⌈ ⌋ ~ ⌈ ⌋ ~ ∪ ∩ ∅ ∅̂
<i>minutes</i>	⌈ ⌋ ~ ⌈ ⌋ ~ ∪ ∩ ∅ ∅̂
<i>infinite</i>	⌈ ⌋ ~ ∅ ∅̂

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lease 0 1

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lease 0 0 1

<i>ip-address</i>	ИЖ Л А
<i>ip-address2...ip-address8</i>	^ ↓ ~ ↓ Л Л

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netbios-name-server 192.168.12.3

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ip address dhcp	↓ А
ip dhcp pool	ИЖ А ↓ ~

23.1.16 netbios-node-type

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3 netbios-node-type А 3 no ↓ Л
А

netbios-node-type type

no netbios-node-type

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$$\begin{array}{ccccc} \tilde{\partial} & & \hat{O} & & \\ & & & & \\ & & \mathbb{H} & & \hat{A} \\ \tilde{\partial} & \mathfrak{z} & \hat{O} & & \\ & & & & \\ \tilde{\partial} & & \hat{O} & & \end{array}$$

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23.1.17 network DHCP

network *net-number* *net-mask* no network

network *net-number* *net-mask*
no network

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<i>net-number</i>	<i>net-number</i>
<i>net-mask</i>	<i>net-mask</i>

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network *net-number* *net-mask*

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network *net-number* *net-mask* no network
show ip dhcp binding
show ip dhcp conflict

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network *net-number* *net-mask*

network 192.168.12.0 255.255.255.240

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ip dhcp excluded-address	<i>net-number</i> <i>net-mask</i>
ip dhcp pool	<i>net-number</i> <i>net-mask</i>

23.1.18 next-server

next-server *ip-address* *ip-address2...ip-address8*
no next-server

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<i>ip-address</i>	next-server <i>ip-address</i> <i>ip-address2...ip-address8</i>
<i>ip-address2...ip-address8</i>	no next-server

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next-server *ip-address* *ip-address2...ip-address8*

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next-server 192.168.12.4

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bootfile	next-server <i>ip-address</i> <i>ip-address2...ip-address8</i>
ip dhcp pool	next-server <i>ip-address</i> <i>ip-address2...ip-address8</i>
ip help-address	next-server <i>ip-address</i> <i>ip-address2...ip-address8</i>
option	next-server <i>ip-address</i> <i>ip-address2...ip-address8</i>

23.1.19 option

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no option

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<i>code</i>	ℙ ℑ ℒ
<i>ascii string</i>	ℙ ℒ
<i>hex string</i>	ℙ ℚ ℑ ℒ
<i>ip ip-address</i>	ℙ ℒ

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option 19 hex 1
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ip dhcp pool	
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23.1.20 service dhcp

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dhcp& { no
service
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service dhcp

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no service dhcp

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DHCP

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DHCP

- › show dhcp lease
- › show ip dhcp binding
- › show ip dhcp conflict
- › show ip dhcp server statistics

23.2.1 clear ip dhcp binding

clear ip dhcp binding 3 Â

clear ip dhcp binding * ip-address

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ip-address	Â

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dhcp pool 3 Â

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clear ip dhcp binding 192.168.12.100

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show ip dhcp binding	∪ Â

23.2.2 clear ip dhcp conflict

clear ip dhcp conflict 3 Â

clear ip dhcp conflict * ip-address

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ip-address	ă Â

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clear ip dhcp conflict *

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ip dhcp ping packets	⌘ ↳ ↑ ~ ă ă 3 Â
show ip dhcp conflict	↳ ↑ ~ ă Â

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 debug ip dhcp server

23.2.6 show dhcp lease

```

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

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3 show ip dhcp binding ^
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show ip dhcp binding ip-address

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ip-address	^ ↓ ~ ↓ Â

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clear ip dhcp server statistics	L Â

24 DHCP Relay

24.1 DHCP Relay

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- 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

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service dhcp

no service dhcp

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service dhcp

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ip helper-address vrf A.B.C.D	П
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24.1.2 ip helper-address

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ip helper-address 61.154.26.49

ip helper-address vrf local 192.168.197.1

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service dhcp	3

24.1.3 ip dhcp relay information option dot1x

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Ip dhcp relay information option dot1x

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service dhcp	3
ip dhcp relay information option dot1x access-group	

24.1.4 ip dhcp relay information option dot1x access-group

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dhcp option dot1x acl А

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

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service dhcp	3
ip dhcp relay information DHCP	

24.1.5 ip dhcp relay information option82

ip dhcp relay information option82 ~
ip dhcp relay information option82 ~ Â

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Ip dhcp relay information option82

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ð	
service dhcp	ð

ip dhcp relay information ~ Â @

25 DNS

25.1

25.1.1 ip domain-lookup

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ip domain-lookup

no ip domain-lookup

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

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show hosts	Â

25.1.2 ip name-server

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```

ip name-server *ip-address*

no ip name-server *ip-address*

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no ip host host-name ip-address

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Ruijie(config)# ip host switch 192.168.5.243

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show hosts	Â

25.1.4 clear host

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clear host host-name

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host-name	↓∪ Ÿ ɹ ǎ Â Ø Ÿ ɹ ǎ Â

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clear host *

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show hosts

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Ruijie# **show hosts**

Name servers are:

static

host type address

switch static 192.168.5.243

www.ruijie.com dynamic 192.168.5.123

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ip host	ý 1
ip name-server	£

no sntp server

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ip-addr ' £

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show sntp ¶

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

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show sntp	
sntp enable	

26.1.3 sntp interval

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sntp interval seconds

no sntp interval

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show sntp ¶

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

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ntp enable	
show ntp	
clock update-calendar	

27 NTP

27.1 NTP

ЛЮ 3'

- › 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

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no ntp

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no ntp

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ntp server	£

27.1.2 ntp access-group

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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

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peer	£ 8 ~ ≠ 6 √ ~ Â

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ntp authentication-key à ntp trusted-key

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

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ntp authentication-key	
ntp trusted-key	Å

27.1.4 0.80u.07p3(Td[(nn)2(trus)810(y)13()]T2_0 1 Tf0 Tc0 Tc 10.5 0 0 10.5

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ntp trusted-key

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ntp authentication-key 6 md5 woooooop

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ntp authenticate	8
ntp trusted-key	
ntp server	Е

27.1.5 ntp disable

ntp disable

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no ntp

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27.1.6 ntp master

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Â 3 й ^ й ^ Â

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

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

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27.1.7 ntp server

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

no ntp server *ip-addr*

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<i>ip-addr</i>	Ì ~ ,
<i>version</i>	^ ↓ ~ ^ ~
<i>if-name</i>	^ ↓ ~ ^ Ъ ~'
<i>keyid</i>	^ ↓ ~ Ъ Ì ¶
prefer	^ ↓ ~ Ì ì Ì

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ntp authenticate	$\hat{A}^8$
ntp authentication-key	$\hat{A}$
ntp server	$\hat{A}^L$

27.1.9 ntp update-calendar

$$\hat{A} \quad \hat{\gamma} \quad \hat{\eta} \quad \hat{\theta}$$

```
ntp update-calendar
no ntp update-calendar
```

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 2. $\text{Ю } \ddot{y}$ $\parallel \hat{A}$
 3. Ю $\hat{A}$ $\downarrow$
 4. б $\downarrow$ π $\neq \downarrow$ $\hat{A}$

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

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27.2

```

, debug ntp
, show ntp status

```

27.2.1 debug ntp

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debug ntp
no debug ntp
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      π  ¿  ¿  ¿
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ð  Ô
      ¿  ¿  Â
      debug ntp
ð  ¿  Ô
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```

27.2.2 show ntp status

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show ntp status
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show ntp status

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<i>address</i>	UDP 20 20

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no ip helper-address ↓ Е Â

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

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ip forward-protocol	

28.1.3 ip forward-protocol

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 ↓ ð Â 3 no
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**ip forward-protocol udp port tftp | domain | time | netbios-ns |
 netbios-dgm | tacacs**
no ip forward-protocol udp^{ns} |

<i>port</i>	~ a Â
tftp	~ l ò Â

domain

29 SNMP

29.1

ЛЮЮ 3'

```

, 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

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3 no snmp-server Â

no snmp-server

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Ruijie(config)# no snmp-server

29.1.2 snmp-server chassis-id

```
chassis-id <chassis-id>
snmp-server chassis-id <chassis-id> text
```


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Ю Ï
Ruijie(config)# **snmp-server contact** *i-net800@i-net.co
m.cn*

ð 3 Ô

3	
show snmp-server	
no snmp-server	3 П

29.1.5 snmp-server enable traps

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Y 3
3 **snmp-server enable trap** Â 3
ÿ П Â

snmp-server enable traps snmp 0 T<2C58>350ETj 5460FF1CB

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3	
snmp-server host	ỹ

29.1.6 snmp-server host

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*

đ Ô

host-addr ' ỹ
ipv6-addr ' ỹ ^ ~
vrfname ' ↓
version ' ~ à à
auth noauth priv ' Â
community-string ' ↓ ^ ~ Â
port-num ' ỹ
notification-type ' ỹ || ~ Â

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đ Ô

3 6 3 **snmp-server enable traps** ~ ỹ ||
 Â
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 a ↓ ~ a ↓ ~ a ↓ ~ a ↓ √ ỹ
 ↓ à ↓ ~ ↓
 ↓ ỹ a ↓ ~ ↓ a ↓ Â

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

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

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Qpacketsize 1600 SN/C2_0 1TT0

snmp-server queue-length	
snmp-server enable host	Ÿ

29.1.13 snmp-server user

Ÿ snmp-server user Â Ÿ

Â

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*

ð

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username ' Â

groupname ' Â

v1 v2 v3 ' Â Â Â

encrypted ' Â Â Â Â

Â

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$$\partial \quad \{ \hat{O}$$

29.1.15 snmp-server view

~ { snmp-server view ^ }

snmp-server view *view-name oid-tree* **include** **exclude**

no snmp-server view *view-name oid-tree*

3	
show run	

29.2.1 show snmp

Ń t

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

0 3 0

3	
snmp-server <i>chassis-id</i>	1

30 RMON

30.1

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- , **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

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

no rmon collection stats *index*

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8 3 8

8 8

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30.1.2 rmon collection history

no

rmon collection history *index* **owner** *ownername* **buckets**

bucket-number **interval** *seconds*

no rmon collection history *index*

0 0

0 3 0

0 0

à a

0 0

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

Ruijie(config-if)# **rmon collection history** 1 zhansan
buckets 10 interval 10

0 3 0

3	
rmon collection stats <i>index</i> owner <i>owner-name</i>	7

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```

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      à      à      à      à      à
      è      ~
      a      ~      Ю      Y"
      ~      ,

```

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```

ㄥЮ      ~      ㄚ      Â
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

```

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③	
rmon event number log trap community description-string	ㄗ Y" ㄥ

30.1.4 rmon event

```

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```

```

rmon event number log trap community description-string
no rmon alarm number

```

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⑧ ③ ⑧

⑧ ⑧

```

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

```

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③	
---	--

rmon alarm <i>number variable interval</i> absolute delta rising-threshold value <i>event-number falling-threshold value</i> <i>event-number owner ownername</i>	7
---	---

30.2

30.2.1 show rmon statistics

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show rmon statictics

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Ruijie# **show rmon statistics**

Statistics : 1

Data source : Gi1/1

DropEvents : 0

Octets : 1884085

Pkts : 3096

BroadcastPkts : 161

MulticastPkts : 97

CRCAAlignErrors : 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

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3	
rmon collection stats <i>index</i> owner <i>owner-string</i>	7

30.2.2 show rmon history

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show rmon history

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ルЮ ~

Ruijie# **show rmon history**

Entry : 1

Data source : Gi1/1

Buckets requested : 65535

Buckets granted : 10

Interval : 1

Owner : zhangsan

Sample : 198

Interval start : 0d:0h:15m:0s

DropEvents : 0

Octets : 67988

Pkts : 726

BroadcastPkts : 502

MulticastPkts : 189

CRCAAlignErrors : 0

UndersizePkts : 0

OversizePkts : 0

Fragments : 0

Jabbers : 0

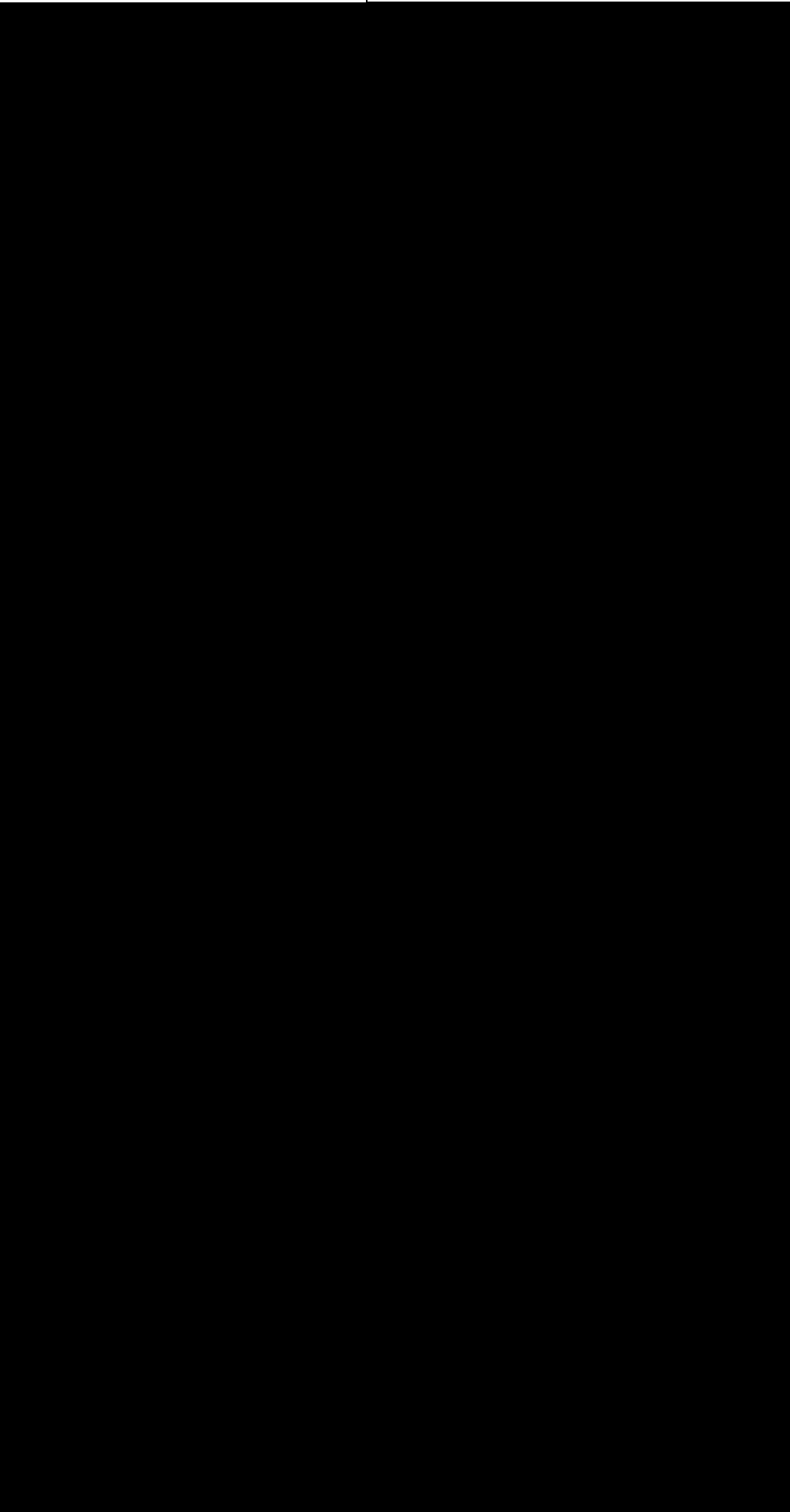
Collisions : 0

Utilization : 0

ð 3 Ô

3	
---	--

rmon collection history <i>index</i> owner					
<i>ownername</i>	buckets	<i>bucket-number</i>	71	✓	8
interval	<i>seconds</i>				



0 0

0 3 0

0 0

ルロ ~ '
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

0 3 0

3	
rmon event number log trap community description-string	7l Y"

31 VRF

31.1 VRF

```
31.1.1 show ip route vrf
31.1.2 clear ip route vrf
31.1.3 ip vrf
31.1.4 rd
31.1.5 route-target
31.1.6 ip vrf forwarding
31.1.7 show ip vrf
```

31.1.1 show ip route vrf

1

2

3 4

31.1.2 clear ip route vrf

clear ip route vrf *vrf-name* *network mask*

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<i>vrf-name</i>	↓
*	
<i>network</i>	^ ↓ ~
<i>mask</i>	^ ↓ ~

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Ruijie# **clear ip route vrf redvrf ***

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show ip route vrf

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31.1.3 ip vrf

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ip vrf *vrf-name*

no ip vrf *vrf-name*

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vrf-name ' ↓

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Ruijie(config)# **ip vrf redvrf**

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import

import

export

both

import

export

both

import

export

both

import

export

import

export

both

import

import

export

both

import

import

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

import

import	export
ip vrf	

import

export

31.1.6 ip vrf forwarding

ip vrf forwarding vrf-name

ip vrf forwarding vrf-name

`vrf-name` ' ' `ip` `mask`

Ö 3 Ö

```

Ruijie(config-if)# ip vrf forwarding redvrf

```

31.1.7 show ip vrf

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32 RIP

32.1

32.1.1 address-family RIP

address-family

no **â**

address-family ipv4 vrf *vrf-name*

no address-family ipv4 vrf *vrf-name*

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vrf <i>vrf-name</i>	3 1 Â

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address-family 3 **VRF** pÁ6(X ÿ 'VRF + 2 % Ñdphm #.

```
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
```

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3	
exit-address-family	Â
ip vrf	Â

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

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version	$\hat{A}$ $\hat{A}$

32.1.3 default-metric (RIP)

$\mathbb{R}$	$\sim$	$\{ \text{default-metric } \hat{A} \}$
no	$\hat{A}$	

default-metric *metric*
no default-metric

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[illegible]

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

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

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3	
redistribute	ÿ † 1 Â

32.1.4 default-information originate(RIP)

```
default-information originate      ~      ↓ √      3
                                 3      3      no      ↓
                                 Â
```

```
default-information originate always metric metric-value
route-map map-name
```

```
no default-information originate always metric route-map
map-name
```

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always	^ ↓ ~ ~ Â
metric metric-value	^ ↓ ~ ~ metric-value
route-map map-name	^ ↓ ~ ↓

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```
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                                 ~     
                                 default-information originate      3
                                 ~      Â
                                 ~     
                                 always      ~      a      ~
                                 ~      a      Â
                                 ~      ↓ √      show ip rip database
                                 Â
```



```

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

```

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```

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

```

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3	
ip rip default-information	
redistribute	è

32.1.5 distance

```

distance distance ip-address wildcard
no distance distance ip-address wildcard

```

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distance	
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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

8

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distribute-list in А з **no** № А

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*

д О

<i>access-list-number</i>	А ↓ ~ ↓ ∪ А
prefix <i>prefix-list-name</i>	А
gateway <i>prefix-list-name</i>	А
<i>interface-type interface-number</i>	↓ ↑ ~ ↓ А

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<i>protocol</i>	↓ ↑ ~ ↑ Â
<i>process-id</i>	↓ <i>protocol</i> ñ Â
<i>process-name</i>	↓ <i>protocol</i> ñ ↓ Â

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```
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
```

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3	
access-list	лх Â
prefix-list	лх Â
redistribute	↑ Â

32.1.8 exit-address-family

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Ю **exit-address-family**

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exit-address-family

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3 no ^

0 0

3 5 ^

0 3 0

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0 0

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3 4 5 5 exit ^

0 0

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

0 3 0

address-family	^

32.1.9 ip rip authentication key-chain

authentication key-chain 3 ip rip

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

```
Ruijie(config-if)# ip rip authentication key-chain  
ripchain
```

$$\partial \quad \quad \quad \partial$$

3	
ip rip authentication mode	Ï Â
ip rip authentication text-password	Â
key chain	ÿ Â

32.1.10 ip rip authentication mode

—

```
3 ip rip authentication
```

mode $\hat{A}$ $\{$ no

 $\hat{A}$

```
ip rip authentication mode text md5
```

no ip rip authentication mode

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text	À
md5	À

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

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

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3

ip rip authentication mode	no
ip rip authentication key-chain	

32.1.12 ip rip default-information

ip rip default-information **no**

ip rip default-information **only** **originate** **metric** *metric-value*
no ip rip default-information

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

metric *metric-value*

metric *metric-value*

ip rip default-information
default-information originate

ip rip default-information
ip rip default-information

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

Ruijie(config-if)# **ip rip default-information only**

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3	
default-information originate	

32.1.13 ip rip receive enable

receive enable Â 3 no 3 ip rip
Â Э

ip rip receive enable

no ip rip receive enable

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no Â 3 3 Â ↓ 3
default Â

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

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

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3	
ip rip send enable	
passive-interface	

3

no ip rip send enable

0 0

3

0 0

0 3 0

0 0

no 3 3 3 3
default 3 3 3 3

0 0

3 3 3 3

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

0 3 0

3	
ip rip receive enable	
passive-interface	

32.1.16 ip rip send version

3 3 3 3
3 ip rip receive version 3 3 no 3

ip rip send version 1 2
no ip rip send version

0 0

1	^ ~ ^ ~ 3
2	^ ~ ^ ~ 3

0 0

3 3 3 3 **version** 3 3

3

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3	
---	--

neighbor RIP~

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3	
auto-summary	-

no neighbor $\hat{A}$

neighbor *ip-address*

no neighbor

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<i>ip-address</i>	$\hat{A}$ $\hat{A}$

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$\hat{A}$

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passive-interface $\hat{A}$ a

32.1.22 offset-list(RIP)

offset-list no

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

ð Ô

<i>access-list-number</i>	$\wedge$
in	
out	
<i>offset</i>	$\downarrow \parallel$
<i>interface-type</i>	

3

'
interface-number

1

```

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        ↓      Â
        ~      æ      ~      æ      ↓      a
        ~      Â      ~      æ      output-delay
        ~      æ
        ~      Â

```

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

```

32.1.24 passive-interface

```

        ↓      Э      ~      ~      ~      ~
passive-interface ~ Â ~ no ~ ~
        Â

```

```

passive-interface default interface-type interface-num
no passive-interface default interface-type interface-num

```

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default	й
interface-type interface-num	б л

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```

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```

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```

passive-interface default ~ й ~ ~ ↓
Л no passive-interface intface-type interface-num ~
        й      Â

        ip rip send enable ~ ip rip receive enable ~
        й      ~      Ю      ~      й
        ~      a "Â      ~      ↓ Л      ,
        ~      ip rip send enable ~ ip rip receive
enable ~      8 Â

```


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async default routing

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Ruijie(config)# **router rip**

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network (RIP)	⌘ ∨ Â

32.1.27 timers basic

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3 timers basicÂ

3

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timers basic *update invalid flush*

no timers basic

ð

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<i>flush</i>	<i>invalid</i>
<i>flush</i>	<i>invalid</i>
<i>Flush</i>	

`show ip rip`
`show ip rip`

`show ip rip`

`show ip rip`

`show ip rip`

`show ip rip`
`show ip rip`

`show ip rip`

`show ip rip`
`show ip rip`

`Ruijie(config)# router rip`
`Ruijie(config-router)# timers basic 10 30 90`

~

`show ip rip`
`show ip rip`

32.1.28 validate-update-source

`show ip rip`
`show ip rip`

`show ip rip`

`show ip rip`

`show ip rip`

`show ip rip`

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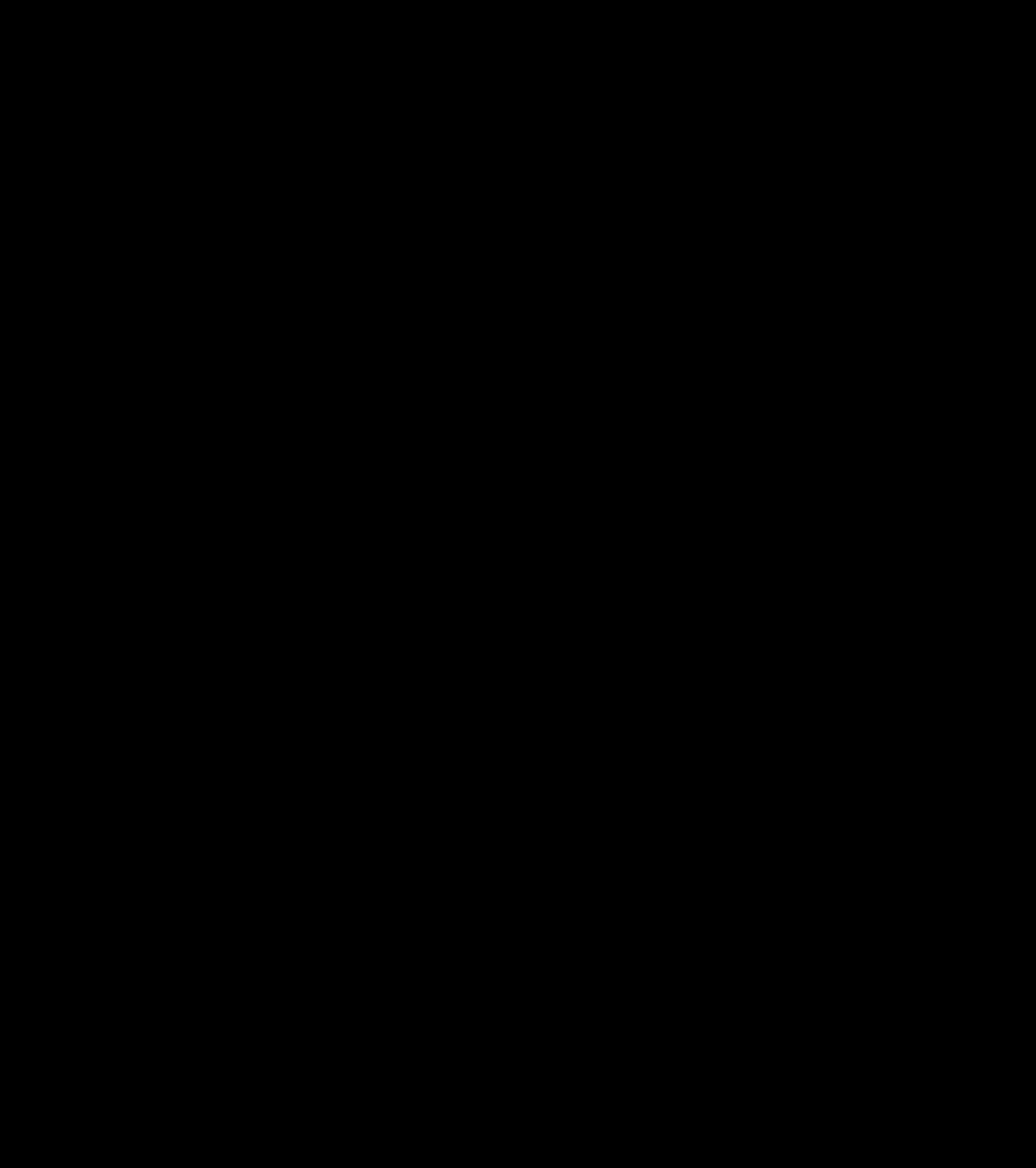
~

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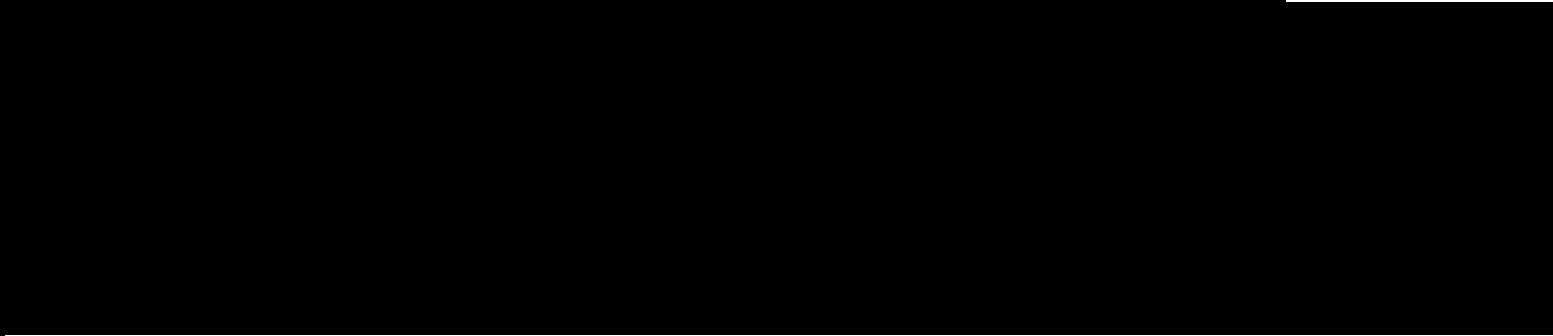
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```

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)
  
```

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```

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

show ip rip database ^

show ip rip database vrf vrf-name network-number network-mask

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vrf vrf-name	^ ↓ ~
network-number	^ ↓ ~ 11 ^
network-mask	^ 11 ~

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^

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№ ^

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

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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

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3	
---	--

show ip rip

^

32.2.3 show ip rip external

show ip rip external ^

show ip rip external **bgp** **connected** **isis** *process-name* **ospf**
1-65535 **static** **vrf** *vrf-name*

ð Ô

bgp connected isis ospf static	^ ↓ ~ ↑
vrf <i>vrf-name</i>	^ ↓ ~
<i>process-name</i>	↓
<1-65535>	∕

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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>Tj7T10 Td<2

nhop=0.0.0.0, if=16391

show ip rip	Â

32.2.4 show ip rip interface

show ip rip interface Â

show ip rip interface vrf *vrf-name*

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vrf <i>vrf-name</i>	^ ↓ ~

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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 6 BFD ||, 8 3 Ю :
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

```

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show ip rip	Â

32.2.5 show ip rip peer

```

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  й
  ~
  show ip rip peer Â

```

show ip rip peer *ip-address* **vrf** *vrf-name*

д Ô

<i>ip-address</i>	^ ↓ ~
vrf <i>vrf-name</i>	^ ↓ ~

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show ip rip	Â

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đ Ô

33 OSPF

33.1

33.1.1 area

no area

area

no area

0 0

area-id	OSPF IP

0 0

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network area	OSPF 〰 OSPF 〰

〰 〰

〰

33.1.2 area authentication

area authentication 〰
no 〰

area *area-id* authentication message-digest

no area *area-id* authentication

〰

、	、
area-id	OSPF 〰 1 〰 1 〰 〰 〰 IP 〰
message-digest	MD5 message digest 5 〰

〰

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〰 〰 〰
〰 〰 〰
〰 〰 〰
message-digest
message-digest
〰
ospf authentication-key 〰
message-digest-key 〰
ip
ip ospf

〰

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```
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
```

```
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
```

$$\hat{O} \quad \hat{O}$$

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

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Ồ Ô

33.1.3 area default-cost

$\mathbb{H}$ Ψ $\hat{\alpha}$
 $\sim \sim$ $\{ \text{area default-cost} \hat{A} \}$ $\{ \text{no} \}$
 $\hat{A}$

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

Ồ Ô

<i>area-id</i>	$\psi \quad \psi \quad \wedge \hat{A}$
<i>cost</i>	ψ $\hat{A}$

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з ↓ ^ ∂ ~ Э ~ 3
 ∂ ^ й ~ ∂ 1 ∂ ∂
 ∂ ∂ ч б з area
 stub area nssa area default-cost Â
 Э area stub з ∂ ∂ area
 nssa з area default-cost з ↓ Э Â

д О

лю з й Â
 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**

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з	з
area stub	OSPF ∂ й Â
area nssa	OSPF ∂ й NSSA ∂

д ↓ О

д О

33.1.4 area filter-list

Э ~ а ↓ ∂ ∂ Â

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

д О

đ Ô

area-id	NSSA Ψ Ψ $\wedge \hat{A}$
no-redistribution	$\hat{A}$ $\downarrow$ $\sim$ nssa ABR $\sim$ $\downarrow$ $\uparrow$ $\{$ Ψ a nssa Ψ $\sim$ $\downarrow \cup$ Θ $\hat{A}$
default-information-originate	$\hat{A}$ $\downarrow$ $\sim$ 7 LSA nssa Ψ $\sim$ $\downarrow$ NSSA ABR ASBR Θ $\hat{A}$
no-summary	$\hat{A}$ $\downarrow$ $\sim$ nssa (ABR) $\downarrow$ LSA nssa Ψ $\hat{A}$

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$\mathbb{R}$ Ψ $\hat{A}$

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$\hat{A}$

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default-information-originate

$\sim$
 Θ $\sim$ Θ
 $\sim$ Θ $\downarrow$ $\neq$ a
 $\hat{A}$

no-redistribution

Θ $\{$
 $\hat{A}$ $\downarrow \cup$ $\hat{A}$

$\downarrow \cup$ Θ μ $\sim$ $\hat{A}$
 $\sim$ $\hat{A}$

area default-cost

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 $\Theta \hat{A}$ $\{$ Ψ Ψ $\hat{A}$
 $\hat{A}$ $\mathbb{Y}$

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```
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
```

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area default-cost	лх ~ Â

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33.1.6 area range

range Â 3 no ~ no 6 cost
 ↓л а Â

area *area-id range ip-address net-mask advertise not-advertise*
cost *cost*

no area *area-id range ip-address net-mask cost*

ð Ô

<i>area-id</i>	ш л ↓л 8 ~ ≠ ↓ л Â
<i>ip-address</i>	лх Â
advertise not-advertise	лх Ω ~ Ω
cost cost	Â

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ш Â

no-summary	^ ↓ ~ ˘ ↓ ÿ Â Â ↓
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area stub ʒ Â ↓

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dead-interval ' '
hello-interval ' '
retransmit-interval ' '
transmit-delay ' '

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3	
area authentication	Â ¢
show ip ospf	Â

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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**

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show ip ospf	

ð 4 Ô

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33.1.10 clear ip ospf process

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clear ip ospf process-id process

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process-id	~ Â 1 ~ Â

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Ruijie# **clear ip ospf 1 process**

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33.1.11 compatible rfc1583

3 ¼ "l ð

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

ð

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alwa wB(se)]TĈ2_0 1 Tf0 Tc 101606 07370 Td<2C409CA34DD<2C54>Tj3.6834 0 Td<
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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

д { О

show ip ospf database	А
show ip route	А

д и О

д О

33.1.13 default-metric

default-metric А { **no** А }

default-metric *metric*

no default-metric

д О

<i>metric</i>	и { А

д О

й А

д { О

А

д О

default-metric { **redistribute** { }
л {

default-metric { { **default-information originate**
а А

ð Ò

```

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

```

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redistribute	† è Â
show ip ospf	

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ð Ò

33.1.14 distance ospf

a 4

```

distance ospf intra-area 1-255 inter-area 1-255 external
1-255
no distance ospf

```

ð Ò

intra-area 1-255	ψ ~ Ì
inter-area 1-255	ψ ~ Ì
external 1-255	~ Ì

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```

3
}

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

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

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

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

```

33.1.15 distribute-list in

```

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

```

33.1.15

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

33.1.15

```

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

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

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

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

```



```

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

```

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ð 1 Ô

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33.1.16 distribute-list out

↑ ~ π redistribute 3

```

distribute-list istname gateway plist-name prefix plist-name out
bgp connected isis area-tag ospf process-id rip static
no distribute-list istname gateway plist-name prefix plist-name
out bgp connected isis area-tag | ospf process-id rip static

```

ð Ô

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

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```

distribute-list out 6 redistribute route-map 3 ~ ý è
↑ ~ a ↑ ~
6 redistribute 3 Â a

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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 re-configure.

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33.1.17 enable mib-binding

enable mib-binding 3

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3 no

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enable mib-binding

no enable mib-binding

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

```

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3	
show ip ospf	
enable traps	π

δ 4 Ô

δ Ô

33.1.18 enable traps

3 ↓ √ || Â 3 no ↓ √

```

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

```

```

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

```

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error			ifauthfailure ifconfigerror ifrxbadpacket virtifauthfailu re virtifconfigerr or virtifrxbadpac ket	

	Ю	б	,	~	↓ √
Isa					Isdbapproach overflow
					Isdboverflow
					maxagelsa originatelsa

retransmit	6 Ю iftxretransmit virtiftxretrans mit
------------	--

	б Ю	✓
	ifstatechange nbrstatechang e virtifstatechan ge virtnbrstatech ange	✓
state-change		

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3 ✓ snmp-server 3 8˘ "l snmp-server
enable traps ospf Ю 1˘ 3 3 Ю Â
3 a ✓ 8˘ a 3 3 Â

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

Ruijie(config)# **enable traps**

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3	
show ip ospf	
enable mib-binding	

ð 4 Ô

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33.1.19

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```
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
```

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area authentication	А џ ѝ
ip ospf authentication-key	А
ip ospf message-digest-key	А

д 4 О

д О

33.1.20 ip ospf authentication-key

authentication-key А 3 no 3 ip ospf А
 ip ospf authentication-key key
 no ip ospf authentication-key

д О

Key	~ ↓л А

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А

д 3 О

А

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ip ospf authentication-key 3 ~ А
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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 dead-interval *seconds* **no ip ospf dead-interval**
ip ospf dead-interval *seconds*
no ip ospf dead-interval

Ruijie(config)# **ip ospf dead-interval** *seconds*

<i>seconds</i>	1-65535

Ruijie(config)# **ip ospf hello-interval** *seconds*

Ruijie(config)# **ip ospf hello-interval** *seconds*

Ruijie(config)# **ip ospf hello-interval** *seconds*

Ruijie(config)# **ip ospf hello-interval** *seconds*


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

⑧ ③ ①

⑧ ④ ①

⑧ ①

33.1.25 ip ospf hello-interval

hello-interval $\hat{A}$ ③ no $\hat{A}$ ③ ip ospf
 ip ospf hello-interval *seconds*
 no ip ospf hello-interval

⑧ ①

<i>seconds</i>	③ ④ ⑤ ⑥ $\hat{A}$

⑧ ①

③ ④
 ③ à
 ③
 ③ à $\hat{A}$

⑧ ③ ①

$\hat{A}$

⑧ ①

④ ≠ ③ $\hat{A}$ ③ ④ ⑤
 ④ $\hat{A}$ ⑤

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```

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

```

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area authentication	ψ 177 Â
ip ospf authentication	Θ 177

ð 1 Ô

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33.1.27 ip ospf mtu-ignore

```

3 no Â 1 mtu 177 3 Â

ip ospf mtu-ignore
no ip ospf mtu-ignore

```

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

Ruijie(config-if)# **ip ospf mtu-ignore**

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Ruijie(config)#

ip ospf priority *priority*

no ip ospf priority

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<i>Priority</i>	"I Â

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"I ÿ" Â

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 $\hat{A}$

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The diagram illustrates the relationship between broadcast and non-broadcast channels. It features a grid of symbols and labels. The top row contains 'I', 'A', and 'I'. The second row contains 'y', 'y', 'A', 'I', 'y', and 'I'. The third row contains 'y', 'y', 'A', 'I', 'y', and 'I'. The fourth row contains 'A', 'y', 'A', 'I', 'y', and 'I'. The bottom row contains 'A', 'y', 'A', 'I', 'y', and 'I'. The labels 'broadcast' and 'non-broadcast' are positioned below the grid. Arrows indicate the flow of information between the channels.

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"I am
"

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ЛЮ "I й Â

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

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

$$\hat{O} \quad \quad \quad \hat{O}$$

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ip ospf network	Â

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33.1.30 ip ospf retransmit-interval

ip ospf transmit delay *seconds*

no ip ospf transmit delay

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<i>Seconds</i>	Ï Æ Â ÿ Æ

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ÿ ÿ ÿ ip ospf transmit delay Ï Â
 æ
 Â area
 virtual-link ÿ retransmit-interval Ï Â
 9 ÿ ÿ Â

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 Ruijie(config)# **interface serial 1/0**
 Ruijie(config-if)# **ip ospf transmit delay 10**

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area virtual-link	Ï Â

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ð Ô

33.1.32 log-adj-changes

ÿ ÿ ÿ no default
 ÿ ÿ Â
 log-adj-changes detail

no log-adj-changes detail

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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**

д О

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**

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**

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ip ospf priority	"I Â
ip ospf network	

д 4 О

д О

33.1.35 network area

Ruijie(config)# **network area Â 3 no**
 Ruijie(config)# **network ip-address wildcard area area-id**
 Ruijie(config)# **no network ip-address wildcard area area-id**

д О

ip-address	Â

3

3

Â

overflow database 0-4294967294 **hard soft**
no overflow database

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1-4294967294	
hard soft	' ~ ' ~ Â

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Â

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~ **hard** ~ a ~
√ ~ **soft**

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

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33.1.37 overflow database external

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

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

$$\partial \quad \partial \hat{O}$$

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Ồ Ô

passive-interface default *type number*
no passive-interface default *type number*

Ồ Ô

bgp <i>isis</i> <i>area-tag</i> ospf <i>process-id</i> rip connected static	↗ ↖
metric	↖
Level-1/ level-1-2/ level-2	↖ ↗ ↘ ↘ ↖ ↗ ↗ ↖
match	↖ ↗ ↘ ↙ ↘ ↘ ↗ ↘ ↙
metric-type	↘ ↖
route-map	↗ ↖
tag	↗ ↖
subnets	↖ ↗

Ồ Ô

 $\vec{O} \quad \vec{3} \quad \vec{O}$

Ồ Ô

isis

ospf

A

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Решение 3

```
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
```

Итого

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


}

0 0

~
vrf vpn_1

Ruijie(config)# router ospf 10 vrf vpn_1

0 0

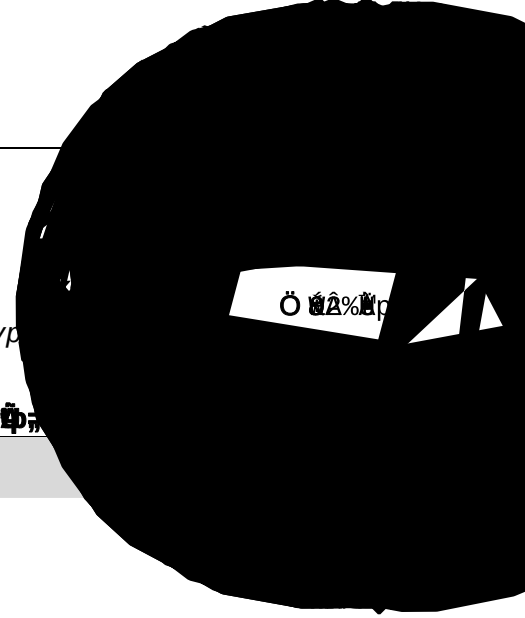
@

OSPF

0

}	
---	--

show ip protocols



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

ð 3 Ô

3	
show ip protocols	Â

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33.1.43 summary-address

T / J T] > 4 C summary-address Â E 36 10 [> 0 D 1 0 17 Â 6 > 1 - 9

```

Ruijie(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

```

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area range	ψ	Θ	Â

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33.1.44 timers lsa-group-pacing

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timers lsa-group-pacing *seconds*

no timers lsa-group-pacing

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<i>seconds</i>	Â

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

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

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spf-delay *spf-holdtime*

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

Ruijie(config-router)# **timers spf 3 9**

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show ip ospf	
timers throttle spf	π π ' ~ √ {

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33.1.46 timers throttle spf

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timers throttle spf ^

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

no timers throttle spf

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<i>spf-holdtime</i>	И ч й Æ̃ √ ' Â
<i>spf-max-waittime</i>	И ч й Æ̃ √ ' Â

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spf-delay ' ,

spf-holdtime ' ,

spf-max-waittime Â

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spf-delay ÿ √ ~ Â

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 5m٬ 1٬ 3٬ 7٬ 15٬ 31٬ 63٬ 89٬ 179٬ 179+90
 Ruijie(config)# **router ospf 20**
timers spf 5 1000 90000

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ЛЮЙ **show ip ospf** 3

Ruijie# **show ip ospf**
Routing Process "ospf 1" with ID 1.1.1.1
Process uptime is 4 minutes
Process bound to VRF default
Conforms to RFC2328, and RFC1583Compatibility flag is enabled
Supports only single TOS(TOS0) routes
Supports opaque LSA
This router is an ASBR (injecting external routing information)
SPF schedule delay 5 secs, Hold time between two SPFs 10 secs
LsaGroupPacing: 240 secs
Number of incoming current DD exchange neighbors 0/5
Number of outgoing current DD exchange neighbors 0/5
Number of external LSA 4. Checksum 0x0278E0
Number of opaque AS LSA 0. Checksum 0x000000
Number of non-default external LSA 4
External LSA database is unlimited.
Number of LSA originated 6
Number of LSA received 2
Log Neighbor Adjacency Changes : Enabled
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

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Number of LSA 6. Checksum 0x028638

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33.2.2 show ip ospf border-routers

show ip ospf border-routers Â

show ip ospf *process-id* border-routers

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show ip ospf border-routers

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Лю й **show ip ospf database** 3

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

10.3



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 3

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Лю й **show ip ospf database external** 3

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 3 ЮÃ

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ЛЮ й **show ip ospf database network** 3 ' 3

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 3

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ЛЮ й **show ip ospf database router** 3

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 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
```

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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 Ю Â

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Лю й **show ip ospf database nssa-external** ' 3

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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 3
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ЛЮЙ **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

: 1290

: 0x2 (*|-|-|-|-|E|-)

LS Type: AS-external-LSA

Link State ID: 20.0.0.0 (External Network Number)

Advertising Router: 1.1.1.1

: 8000000a

Checksum: 0x7627

Length: 36

Network Mask: /24

Metric Type: 2 (Larger than any l >9 State IDpath

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ЛЮ ÿ **show ip ospf database database-summary** 3

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 3

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Router Link	щ ~ Â

ospf interface *Â*

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

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<i>interface-type</i>	^ ↓ ~ Â
<i>interface-number</i>	^ ↓ ~ 1 Â

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10 ÿ **show ip ospf interface FastEthernet 1/0** 3

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
```

6 BFD ~ ж 7 Ю :

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

show ip ospf interface serial 1/0 ж Ю Â

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<i>interface-type</i>	^ ~	Â
<i>interface-number</i>	^ ~	
<i>neighbor-id</i>	^ ~	Â

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ЛЮй **show ip ospf neighbor** з

```
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 (*|0|-|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 з Ю

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33.2.6 show ip ospf route

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show ip ospf process-id route count

0 0

<i>process-id</i>	~ ^
count	^

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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

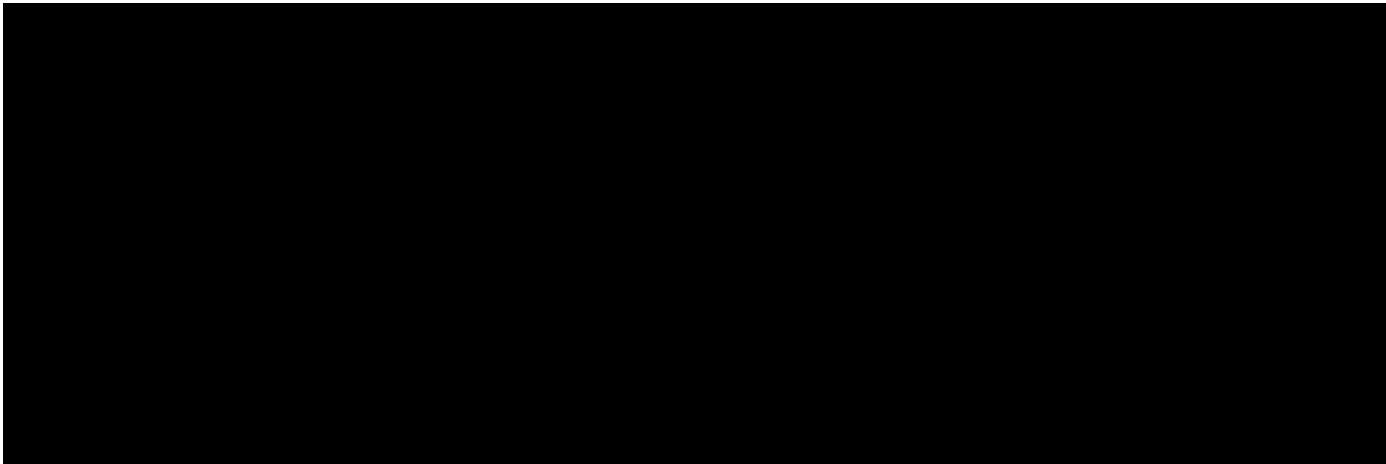
E2 100.0.0.0/24 [1/20] via 192.88.88.126, FastEthernet 1/0

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

show ip ospf route 3

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33.2.8 show ip ospf virtual-link

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virtual-link Â

show ip ospf *process-id* virtual-link

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ЛЮй show ip ospf virtual-links 3

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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

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show ip bgp	

34.1.6 bgp bestpath compare-confed-aspath

```

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

```

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

Ruijie(config)# **show ip bgp**

show ip bgp	
bgp router-id	

34.1.7 bgp bestpath compare-routerid

```

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

```

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

Ruijie(config)# **show ip bgp**

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Ruijie(config)# **router bgp** 65000Ruijie(config-router)# **bgp bestpath med confed**ð ʒ Ô

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show ip bgp	
bgp bestpath always-compare-med	~ a ↓
bgp bestpath med confed	~
bgp deterministic-med	~ ↓ "1

34.1.10 bgp client-to-client reflection

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bgp client-to-client reflection

no bgp client-to-client reflection

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reflection Â

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

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bgp cluster-id	↓
neighbor route-reflector-client	↓

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34.1.11 bgp cluster-id

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bgp cluster-id *cluster-id*

no bgp cluster-id *cluster-id*

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Ruijie(config-router)# bgp default ipv4-unicast
Ruijie(config-router)# address-family ipv4
Ruijie(config-router-address-family)#

```

address-family ipv4	

34.1.15 bgp default local-preference

[illegible]

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Ruijie(config-router)# bgp default local-preference  
200
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show ip bgp	
bgp bestpath	
always-compare-med	

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bgp bestpath med missing-as-worst	~ "l ñ æ

34.1.17 bgp enforce-first-as

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

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router bgp	

34.1.19 bgp log-neighbor-changes

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bgp log-neighbor-changes

no bgp log-neighbor-changes

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

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router bgp	

34.1.20 bgp router-id

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bgp router-id ip-address

no bgp router-id ip-address

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ip-address	Â

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

0 3 0

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soft in	$\tilde{A}$	$\hat{A}$
soft out	$\tilde{A}$	$\hat{A}$

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$\begin{matrix} \text{9} \\ \text{11} \end{matrix} \quad \hat{A}$

$\begin{matrix} \text{8} \\ \text{10} \end{matrix} \quad \begin{matrix} \text{10} \\ \text{12} \end{matrix}$

$\hat{A}$

$\begin{matrix} \text{10} \\ \text{12} \end{matrix} \quad \begin{matrix} \text{12} \\ \text{14} \end{matrix}$

$\begin{matrix} \text{10} \\ \text{12} \end{matrix} \quad \hat{A}$

$\tilde{A}$ a

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a $\begin{matrix} \text{9} \\ \text{11} \end{matrix}$ $\begin{matrix} \text{10} \\ \text{12} \end{matrix}$ ð neighbor

soft-reconfiguration inbound ð

ð $\hat{A}$ ð $\hat{A}$

$\begin{matrix} \text{10} \\ \text{12} \end{matrix}$ show ip bgp neighbors ð

$\begin{matrix} \text{9} \\ \text{11} \end{matrix}$ $\begin{matrix} \text{10} \\ \text{12} \end{matrix}$ ð

neighbor soft-reconfiguration inbound ð $\hat{A}$

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Ruijie# clear bgp ipv4 unicast *

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neighbor soft-reconfiguration inbound	~
show ip bgp	

34.1.22 clear bgp ipv4 unicast dampening

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clear bgp ipv4 unicast dampening *address mask*

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<i>address</i>	$\hat{A}$
<i>mask</i>	$\hat{A}$

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

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show ip bgp dampening dampened-paths	

bgp dampening


```
Ruijie# clear bgp ipv4 unicast peer-group my-group in
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soft-reconfiguration inbound й

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ipv4 unicast	
in	a 7 ~ Æ Ÿ Â

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

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<i>peer-group-name</i>	↓
ipv4 unicast	
in	a ¶ soft Æ ŷ ¶ Â
out	a ¶ soft Æ ŷ ¶ Â
soft	Æ [~] Æ Â
soft in	Æ [~] Æ Â
soft out	Æ [~] ¶ Æ Â

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Ruijie#

<i>vrf-name</i>	↓
*	Æ IO Â
<i>address</i>	Æ IO 6 Â
ipv4 unicast	
in	a ¶ soft Æ ŷ ¶ Â
out	a ¶ soft Æ ŷ ¶ Â
soft	Æ Æ Â
soft in	Æ Æ Â
soft out	Æ ↑ Æ Â

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

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clear ip bgp	Æ
show ip bgp	

34.1.32 default-information originate

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no default-information originate

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<i>external-distance</i>	$\ddot{y} \quad \quad \quad \hat{A}$
<i>internal-distance</i>	$\ddot{y} \quad \quad \quad \hat{A}$
<i>local-distance</i>	$\ddot{y} \quad \quad \quad \hat{A}$

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$$\tilde{O} \quad \mathfrak{z} \hat{O}$$

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neighbor soft-reconfiguration inbound	~
show ip bgp	

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$\hat{A}$

Ồ Ô

$$\hat{e} \quad \quad \quad \hat{I} \quad \hat{A}$$

Ồ Ô

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

$$\mathcal{O} \quad \mathfrak{z} \hat{\mathcal{O}}$$

$\mathfrak{f}$	
neighbor filter-list	$\mathfrak{E}$ $\mathfrak{g}$
neighbor distribute-list	$\mathfrak{E}$ $\mathfrak{f}$

34.1.37 neighbor activate

$$\begin{array}{ccccccc} & & \{ & & \text{Ю} & & \hat{A} & & \} \\ \downarrow \text{Л} & & & & \hat{A} & & & & \end{array}$$

```
neighbor peer-address peer-group-name activate
no neighbor peer-address peer-group-name activate
```

Ồ Ô

<i>peer-address</i>	^
<i>peer-group-name</i>	^ a ^

Ồ Ô

Ю

$$\tilde{O} \quad \{ \quad \hat{O}$$

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3 ε

$$\hat{A}$$

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```
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
```


③ ④

③	
router bgp	
neighbor remote-as	^

34.1.38 neighbor advertisement-interval

③ ^ ④ no ⑤

neighbor *peer-address* *peer-group-name* **advertisement-interval**
seconds

no neighbor *peer-address* *peer-group-name* **advertisement-interval**
seconds

③ ④

<i>peer-address</i>	^
<i>peer-group-name</i>	① ^ ② a
<i>seconds</i>	^

③ ④

③ ④

③ ④

^

③ ④

```
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
```

③ ④

3

3	
---	--

router bgp

router bgp	
neighbor remote-as	$\hat{A}$

34.1.40 neighbor as-override

$\mathcal{L}$ $\mathfrak{z}$ $\wedge \hat{A}$ $\mathfrak{z}$ **no** $\downarrow$
 $\mathcal{L}$ $\hat{A}$

neighbor *peer-address* *peer-group-name* **as-override**

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

δ $\hat{O}$

<i>peer-address</i>	$\hat{A}$
<i>peer-group-name</i>	$\downarrow \hat{A}$ $\downarrow a$ $\hat{A}$

δ $\hat{O}$

π

δ $\mathfrak{z}$ $\hat{O}$

$\sim$ $\sim$

δ $\hat{O}$

$\mathcal{K}^{\sim}$ a $\acute{e}$ $\downarrow$ $\wedge$ $\sim$
 $\mathfrak{z} \downarrow \mathcal{L}$ $\wedge^{\sim}$ $\downarrow \mathcal{L}$ $\ddot{y}$ $\downarrow$ $\wedge$
 $\hat{A}$
 $\sim$ $\dot{\eta}$ $\mathcal{C}$ $\acute{e}$ $\downarrow$ $\wedge^{\sim}$ π
 $\mathcal{K}^{\sim}$ $\mathcal{C}$ $\mathfrak{z}$ $\sim$ $\mathfrak{Z}$ $\mathfrak{Z}$ $\mathfrak{z} \wedge^{\sim}$
 $\downarrow \mathcal{L}$ $\wedge^{\sim}$ $\downarrow$ $\downarrow \mathcal{L}$ $\hat{A}$
 $\downarrow$ π $\hat{A}$

δ $\hat{O}$

```

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

```

δ $\mathfrak{z} \hat{O}$

router bgp	
neighbor remote-as	^

34.1.41 neighbor default-originate

no neighbor peer-address peer-group-name default-originate

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

Ø Ô

peer-address	^
peer-group-name	^ a ^
map-tag	^ a ^

Ø Ô

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^ ÿ ^
^ ÿ ^

Ø Ô

```
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
```

Ø 3 Ô

3	
router bgp	
neighbor remote-as	Â

router bgp	
neighbor remote-as	Â
ip access-list	

34.1.44 neighbor ebgp-multihop

3 1 Â 3
1 Â

neighbor *peer-address* *peer-group-name* **ebgp-multihop** *ttl*

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

ð Ô

<i>peer-address</i>	Â
<i>peer-group-name</i>	1 Â 1 a Â
<i>ttl</i>	Â

ð Ô

1 6 Â
~ a ~ æ Â

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

ð 3 Ô

3	
router bgp	
neighbor remote-as	Â

34.1.45 neighbor filter-list

3 4 ~ Â

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*

8 0

```
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
```

8 3 0

3	
router bgp	
neighbor remote-as	Â
ip as-path access-list	
match as-path	7

34.1.46 neighbor maximum-prefix

3 8 y Â 3 no
 ✓ 8 Â

neighbor

$$\mathcal{O} \quad \mathcal{Z} \quad \mathcal{O}$$

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

Ruijie(config-router)# **neighbor 10.0.0.1 next-hop-self**

0

3 0

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

 $\sim$
$$a \quad a \downarrow \quad \downarrow \quad \sim \neq a$$

Ồ Ô

```
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
```

$$\partial \quad \quad \quad \partial$$

3	
router bgp	
neighbor remote-as	Â
neighbor peer-group (creating)	
show ip bgp peer-group	

34.1.50 neighbor peer-group (creating)

$\hat{A}$ $\hat{A}$ no
 $\hat{A}$

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

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

⑧ ⑧

<i>peer-group-name</i>	↓ ⑧ ↓ a ⑧

⑧ ⑧

⑧

⑧ ③ ⑧

⑧ ⑧

↓ ⑧ ↓ ⑧ ↓ ⑧ ↓ ⑧ ⑧

⑧ ⑧

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

Ruijie(config-router)# **neighbor Red-Giant peer-group**

⑧ ③ ⑧

③	
router bgp	
neighbor remote-as	⑧
neighbor peer-group assigning members	⑧
show ip bgp peer-group	

34.1.51 neighbor prefix-list

↓ ⑧ ③ no ↓ ③ ⑧

neighbor *peer-address peer-group-name prefix-list prefix-list-name*
in out

no neighbor *peer-address peer-group-name prefix-list in out*

⑧ ⑧

<i>peer-address</i>	⑧

peer-group-name

$\{$ $\hat{A}$ $\{$ no
 $\hat{A}$

neighbor *peer-address peer-group-name remote-as as-number*

no neighbor *peer-address peer-group-name remote-as as-number*

ð Ô

<i>peer-address</i>	$\sim \neq \downarrow \hat{A} \downarrow$
<i>peer-group-name</i>	$\downarrow \hat{A}$ $\downarrow a \hat{A}$
<i>as-number</i>	$\wedge \hat{A}$

ð Ô

$\hat{A}$

ð $\{$ Ô

$\sim \sim$

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$\hat{A} \sim \neq \{$

ð Ô

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

Ruijie(config-router)# **neighbor** 10.0.0.1 **remote-as** 80

ð $\{$ Ô

$\{$	
router bgp	

34.1.53 neighbor remove-private-as

$\{$ $\wedge \hat{A}$ $\{$ no $\downarrow \hat{A}$

neighbor *peer-address peer-group-name remove-private-as*

no neighbor *peer-address peer-group-name remove-private-as*

ð Ô

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

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

ð 3 Ò

3	
router bgp	
neighbor remote-as	Â
bgp cluster-id	↓ Â
bgp client-to-client reflection	↓ ↓ Â

34.1.56 neighbor send-community

3 Â 3 no
π Â

```
neighbo peer-address peer-group-name send-community
both standard extended
no neighbor peer-address peer-group-name send-community
both standard extended
```

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	Â
peer-group-name	↓ a Â

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  ~ 8
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```

show ip bgp neighbors

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```

Ruijie(config)# router bgp 65000
Ruijie(config-router)# neighbor 10.0.0.1
soft-reconfiguration inbound

```

ð 3 Ô

3	
router bgp	
neighbor remote-as	Â
show ip bgp neighbors	
clear ip bgp	Æ

34.1.59 neighbor soo

```

3 l no 3 √ l
  Â

```

```

neighbor peer-address peer-group-name soo soo-value
no neighbor peer-address peer-group-name soo

```

ð Ô

<i>peer-address</i>	$\hat{A}$
<i>peer-group-name</i>	$\downarrow \hat{A}$ $a \quad \hat{A}$
<i>soo-value</i>	$\hat{A} \quad \downarrow \cup \quad \cup \quad a \downarrow$ ^ ~ 'Ω ^ ~ : ~ ⊗

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$$\hat{A} \quad \hat{B} \quad \hat{C} \quad \hat{D} \quad \hat{E} \quad \hat{F} \quad \hat{G} \quad \hat{H} \quad \hat{I} \quad \hat{J} \quad \hat{K} \quad \hat{L} \quad \hat{M} \quad \hat{N} \quad \hat{O} \quad \hat{P} \quad \hat{Q} \quad \hat{R} \quad \hat{S} \quad \hat{T} \quad \hat{U} \quad \hat{V} \quad \hat{W} \quad \hat{X} \quad \hat{Y} \quad \hat{Z}$$

Ồ Ô

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# neighbor 10.0.0.1 remote-as 100
Ruijie(config-router)# address-family ipv4 vrf vpn1
Ruijie(config-router-af)# neighbor 10.0.0.1 so
100:100
```

$$\partial \quad \quad \quad \partial$$

3	
router bgp	
timers bgp	<i>keepalive holdtime</i>

34.1.60 neighbor timers

$$\hat{A} \quad \hat{A}$$

```
neighbor peer-address peer-group-name timers keepalive holdtime
no neighbor peer-address peer-group-name timers keepalive
holdtime
```

Ồ Ô

<i>peer-address</i>	~ Â
<i>peer-group-name</i>	↓ a ↓ Â
<i>keepalive</i>	Â ' Â
<i>holdtime</i>	Ï ' Â

ð Ô

keepalive:

holdtime

ð 3 Ô

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 3 ~ 6 Â
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 Â Ï 3 Ë

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

Ruijie(config-router)# **neighbor 10.0.0.1 80 240**

ð 3 Ô

3	
router bgp	
timers bgp	<i>keepalive holdtime</i>

34.1.61 neighbor unsuppress-map

3 Ω "I **aggregate-address** 3 8
 Â 3 **no** Â

neighbor *peer-address peer-group-name unsuppress-map*
map-tag

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

ð

Ô

<i>peer-address</i>	Â
<i>peer-group-name</i>	λ Â
	λ a

no neighbor *ip-address peer-group-name version number*

ð Ô

<i>peer-address</i>	Â
<i>peer-group-name</i>	Â a
<i>number</i>	Â

ð Ô

Â

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Â

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Ruijie(config-router)# **neighbor 10.1.1.1 version 4**

ð ð Ô

router bgp	
neighbor remote-as	Â

34.1.64 neighbor weight

Â ð **no** ð

neighbor *ip-address peer-group-name weight number*

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

ð Ô

<i>ip-address</i>	Â
<i>peer-group-name</i>	Â a
<i>number</i>	Â

Ồ Ô

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# network 10.0.0.1 mask
255.255.0.0
```

3	
router bgp	
redistribute	*
Network synchronization	↓

```

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

```

3

3	
---	--

router bgp

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	$\hat{A}$
external 12	$\sim \downarrow \mathcal{L} \hat{\epsilon}$
	$a \sim$

③

③ ④

③	
show ip protocols	

34.1.69 router bgp

③ no ④

router bgp *as-number*
no router bgp *as-number*

③ ④

<i>as-number</i>	④ ⑤

③ ④

⑤

③ ④

⑤

③ ④

③ ④ ⑤

③ ④

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

③ ④

③	
ip routing	
bgp router-id	
network	⑥

34.1.70 synchronization

③ ④ ⑤ ⑥ ⑦ no ⑧

synchronization

no synchronization

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8 0

```
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

3

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show ip bgp cidr-only

S

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<i>community-number</i>	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
exact-match	Y

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3

2

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```
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

3

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2

show ip bgp community-list *community-name* **exact-match**

Õ Õ

<i>community-name</i>	1
exact-match	Y

0		0
0	3	0
0		0
		3
0	0	

```

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

```

0	3 0
---	-----

3	
ip community-list	17

34.2.5 show ip bgp dampening dampened-paths

		8	Â
			show ip bgp dampening dampened-paths
0			0
0	3		0
0			0
			3

ð Ô

```
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

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show ip bgp dampening flap-statistics

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```
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

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```
show ip bgp dampening parameters
```

```

0      0

```

```

0  3  0

```

```

0      0

```

3

```

0      0

```

```

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*

ð Ô

<i>path-list-number</i>	1

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ð Ô

ð Ô

```
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

show ip bgp inconsistent-as

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

34.2.10 **show ip bgp neighbors**

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show ip bgp neighbors *neighbor-address* **received-routes** **routes**
advertised-routes

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```
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

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```
show ip bgp paths
```

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```

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

34.2.12 show ip bgp quote-regexp

3

7

4

/1

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```
show ip bgp quote-regexp regexp
```

```

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```

<i>regexp</i>	7 /1 Â

```

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```

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```

3

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```
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

3

7

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show ip bgp regexp *regexp*

ð Ô

<i>regexp</i>	7 ^

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3

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```
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

3 A

show ip bgp summary

0 3 0

0 0

3

0 0

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
---------	---	-----	---	---	---	---

never Active

Total number of neighbors 1

0 3 0

3	
router bgp	

34.2.15 show ip bgp vpnv4

show ip bgp vpnv4 vrf *vrf_name* *network* **summary** **label**

show ip bgp vpnv4 rd *rd_value* *network* **neighbor** **address**
summary **label**

ð

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<i>network</i>	Â

```
BGP router identifier 192.168.0.4 , local AS num 100
BGP VRF vrf1 Route Distinguisher ' 100 ' 30
BGP table version is 1
3 BGP AS PATH entries
0 BGP community entries
Neighbor V AS MsgRcvd Msgsend TblVer IntQ
OutQ Up/Down State/PfxRcd
192.168.4.1 4 20 15 16 1 0 0
00:10:36 3
Total number of neighbors 1
```

0 1 0

~

}

}

Â

show ip community-list *community-list-number*

35

35.1

35.1.1 distribute-list in

distribute-list in *access-list-number* *name* **prefix** *prefix-list-name*
gateway *prefix-list-name* **in** *interface-type* *interface-number*

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*

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<i>access-list-number</i>	<i>name</i> prefix <i>prefix-list-name</i> gateway <i>prefix-list-name</i> in <i>interface-type</i> <i>interface-number</i>
prefix <i>prefix-list-name</i>	
gateway <i>prefix-list-name</i>	

```

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

```

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access-list	℥
prefix-list	℥

35.1.2 distribute-list out

```

distribute-list out access-list-number name prefix prefix-list-name
no distribute-list access-list-number name prefix prefix-list-name
out interface protocol process-id

```

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

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```
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
```

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3	
access-list	лх
prefix-list	лх
redistribute	↑

35.1.3 ip community-list

3 лх ~ 8 Â no 3 è Â

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

δ Ô

<i>community-list-name</i>	↓ ↓ а Â
standard	~ л й
expanded	~ л й лю
permit	
deny	
<i>community-number</i>	л Â й л ~ ≠ ↓ лю лю х л

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<i>network</i>	л Â

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default-network

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ip route 192.168.100.0 255.255.255.0 serial 0/1

ip default-network 192.168.100.0

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ip default-network 200.200.200.0

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3	
show ip route	Â

35.1.5 ip prefix-list

ip prefix-list

3 Â 3 no

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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*

ð Ô

<i>prefix-lis-name</i>	J
<i>seq-number</i>	L M Â È Â Z M Y J M Â M J L M
deny	7
permit	7
<i>ip-prefix</i>	L Â J L Â y
<i>minimum-prefix-length</i>	^ J ~ ' ge Z
<i>maximum-prefix- length</i>	^ J ~ ' le Z

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```
ip prefix-list 3
  ā 7
```

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$$\begin{array}{ccccccc} & \hat{\mathbb{A}} & & & & & \\ & \downarrow & & & & & \\ \mathbb{A} & & \mathbb{B} & & \mathbb{C} & & \mathbb{D} \end{array}$$
$$\begin{array}{ccccccc} & & \mathbb{A}^1 & & \mathbb{A}^1 & & \\ & & \downarrow & & \downarrow & & \\ \mathbb{A}^1 & & \mathbb{A}^1 & & \mathbb{A}^1 & & \mathbb{A}^1 \\ & & \downarrow & & \downarrow & & \downarrow \\ & & \mathbb{A}^1 & & \mathbb{A}^1 & & \mathbb{A}^1 \end{array}$$
$$\begin{array}{ccc} \gamma & \hat{A} & \gamma \\ \hat{A} & & \gamma \end{array}$$
$$\hat{A} \quad \gamma \quad \hat{A} \quad \gamma$$
$$\ddot{y} = \hat{A} \tilde{y} + \tilde{B} u$$
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```

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 <description-text>
no ip prefix-list description <description-text>

```

ip prefix-list *prefix-lis-name* **description** *descripton-text*

ð Ô

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

ð Ô

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```

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

```

35.1.7 ip prefix-list sequence-number

3

`ip static`
`route-limit`
`a`
`show running config`
`ip static route-limit 900`

35.1.11 ipv6 prefix-list

`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`

`deny`
`permit`

<i>prefix-lis-name</i>	
<i>seq-number</i>	
deny	
permit	
<i>ipv6-prefix</i>	
<i>minimum-prefix-length</i>	

<i>maximum-prefix- length</i>	^ ~ ' le }
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ipv6 prefix-list

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```
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

description	no	ipv6 prefix-list
ipv6 prefix-list		

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

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⑧ ③ ⑧

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```

Ruijie# configure terminal
Ruijie(config)# ipv6 prefix-list pre description Deny
routes from Net-A

```

```

Ruijie# configure terminal
Ruijie(config)# ipv6 prefix-list pre description Deny
routes from Net-A

```

35.1.13 ipv6 prefix-list sequence-number

```

Ruijie# configure terminal
Ruijie(config)# ipv6 prefix-list description

```

Ipv6 prefix-list sequence-number

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```

Ruijie# configure terminal
Ruijie(config)# ipv6 prefix-list description

```

```

Ruijie# configure terminal
Ruijie(config)# ipv6 prefix-list pre description Deny
routes from Net-A

```

35.1.14 match as-path

match origin	7
set as-path prepend	↑ Â
set metric	↑
set metric-type	↑

35.1.16 match interface

7 Ю ÿ ~ 3 match
interface Â 3 **no** Â

match interface *interface-type interface-number ...interface-type interface-number*

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

ð Ô

<i>interface-type</i>	
<i>interface-number</i>	1

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ð Ô

match interface 3 1 ↓ 11 Â
 ↓ 11 ÿ ↑ 1
 11 ↑ 1 11 Â ↓
 ↑ 11 Â
 ↑ ~ ^ ~ 4
 ↑ ~ 8 Â
 ~ ↓ 11 **match** 3
set 3 Â **match** 3 7 **set** 3
 a Â

ð Ô

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

8 3 0

3	
match ip address	7
match ip next-hop	7 10
match ip route-source	7
match metric	7

<i>access-list-number</i>	1
<i>access-list-name</i>	1
prefix-list <i>prefix-list-name</i>	1 1

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match ip address ꞑ ꝲ ꝵꝶ ꝷ ꝸ Â

 ꝵꝶ ÿ Ꝺ ꝺ Ꝼ Â ꝼ

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 ꝿ ꝺ Â Ꝺ ꝼ

Ᵹ Â

 ꝿ ⁁ ⁂ ~ ⁃ 4

 ꝿ ° 8 Â

 ꝵꝶ **match** Ꝺ **set** ꝺ

set Ꝺ Â **match** ꝺ⁁ ꝿ , **set** ꝺ⁁

a Â

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```
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
```

$$\partial \quad \quad \quad \partial$$

?	
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

? ?

? **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...*

ø Ô

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

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?

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match ip next-hop

3 1 2 3

1

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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
```

3

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.994 5

set metric-type	↑
set tag	↑

35.1.21 match ipv6 next-hop

```

    ↑  Ю
    ~
    { match ipv6 address ^      { no
      ^

```

match ipv6 next-hop *access-list-name* **prefix-list** *prefix-list-name*

no match ipv6 next-hop

δ Ô

<i>access-list-name</i>	↓
prefix-list <i>prefix-list-name</i>	↱ ↓

δ Ô

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δ ↱ Ô

^

δ Ô

```

      ↓↱ ÿ      ↑  1      π  ^  ↓
↱      ↑  ↱      ~ # ↓↱
      ↑  ↱      ^      ^      ↑  ↓
↱      ^      ~      ~      4
      ↑  ~      ^      8 ^
      ↑
      ~ ↓↱      match  ↱      set  ↱
a      ^      ^      '

```

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      ↑  ~ ↓↱      ↑      ∅ ^ a
      ~  è      ~  ↓      ↱ a ↓  ^
      ↓      ↑  ∅ a ↓      ~  è
      ↱ ≠ a      ↓ ^

```

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```

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

```

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3	
ipv6 access-list	лх
match interface	г ю
match ipv6 address	г ю
match ipv6 route-source	г
match metric	г
match route-type	г
match tag	г
set metric	↑
set metric-type	↑
set tag	↑

35.1.22 match ipv6 route-source

↑ ю

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3 match ipv6 address А 3 no

А

```

match ipv6 route-source access-list-name prefix-list
prefix-list-name

```

no match ipv6 route-source

д О

access-list-name	л

match ipv6 route-source	7
match metric	7
match route-type	7
match tag	7
set metric	↑
set metric-type	↑
set tag	↑

35.1.23 match length

8 0

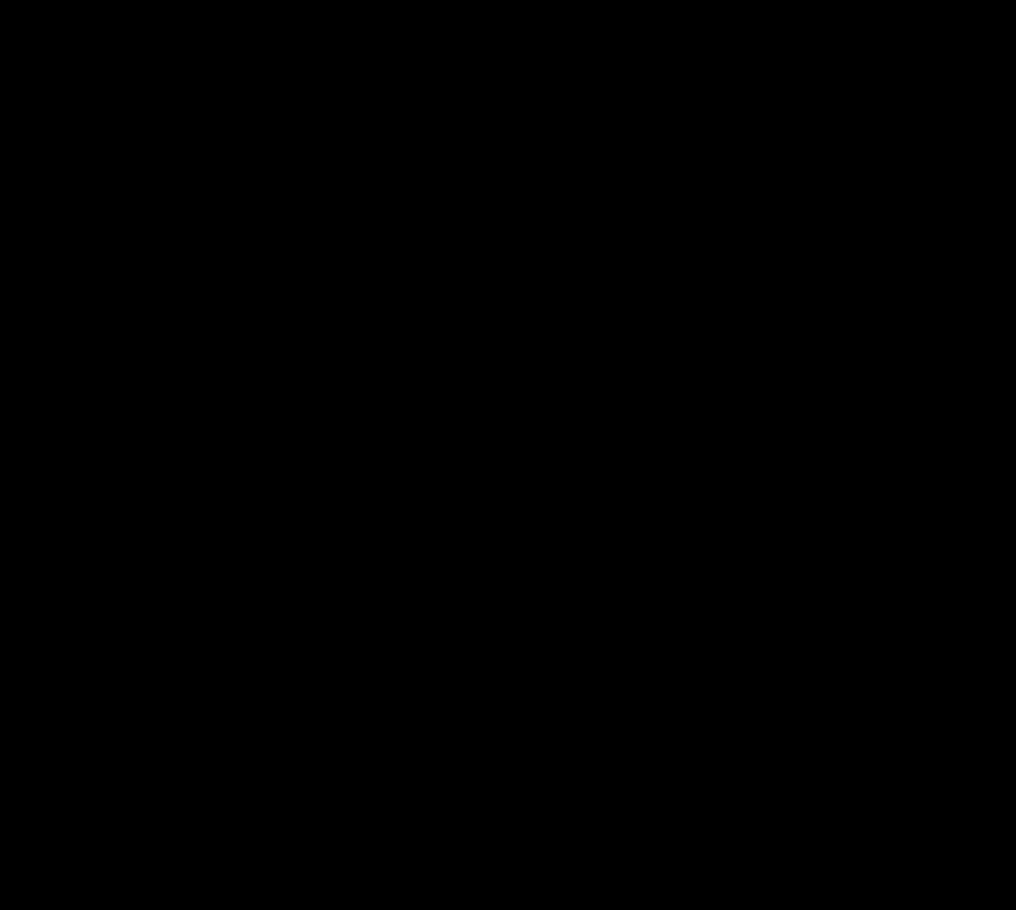
~ y ~

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

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

8 3 0

3	
route-map	10
match ip address	7
set default interface	~
set interface	
set ip default next-hop	10 ~
set ip next-hop	10
set ip precedence	



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~ ≠ ↓ √
Â ↑
~ ~ 4
match { set {
' }
Â ↓ ÷

```
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
```

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{	
access-list	⌘
match ip address	7



3

↑
originÂ 3 no Â 3 match
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
```

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

35.1.27 match tag

ð ð ð match tag ð ð no

```
match tag tag ...tag
no match tag tag ...tag
```

ð ð

tag	

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match tag ð ð ð

[illegible]

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```
router rip
 redistribute ospf 100 route-map redrip
 network 192.168.12.0
```

```
route-map redrip permit 10
match tag 50 80
```

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?	
access-list	??
match ip address	?
match interface	? ?
match ip route-source	?
match metric	?

permit

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<i>as-number</i>	1
<i>ip_addr</i>	

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3 1 ^ ~ ~ a 1

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

ð 3 Ô

3	
match as-path	7
match community	7
match metric	7
match origin	7
set community	↑
set metric	↑
set metric-type	↑

35.1.31 set as-path prepend

7 7 ~
3 set as-path prepend Â 3 no Â
3 Â

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

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<i>community-list-number</i>	1
<i>community-list-name</i>	1

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ð Ô

3

7

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```
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
```

ð 3 Ô

3	
match as-path	7
match metric	7
match origin	7
set as-path prepend	↑
set local-preference	↑ "1
set metric-type	↑

35.1.33 set community

7

~

match metric	7
match origin	7
set as-path prepend	↑
set origin	↑
set metric-type	↑

35.1.34 set dampening

7 dampening ^ 3 no ^ 3 set ^

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

ð Ô

<i>half-life</i>	↓ a ↓ ^ ↑ ~ ñ ↑
<i>reuse</i>	^ æ ~ ñ ^ 8
<i>suppress</i>	~ ^ 8 ^
<i>max-suppress-time</i>	8 ^ ↑ ~ ñ

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

```

ute-map tag in

```

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immunity-value 500


```

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

```

ð ð

match as-path	7
match community	7
match metric	7
match origin	7
set as-path prepend	↑
set metric	↑
set metric-type	↑

35.1.36 set ip default next-hop

```

7
3 set ip next-hop ^ 7 no ^

```

```

set ip default next-hop ip-address weight ...ip-address weight
no set ip default next-hop ip-address weight ...ip-address
weight

```

ð ð

<i>ip-address</i>	Ю
<i>weight</i>	Ю

ð ð

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ð ð

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ð ð

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

8 3 0

3	
route-map	18
match ip address	7
set default interface	~
set default interface	~
set interface	
set ip next-hop	Ю ~
set ip precedence	"I

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

35.1.38 set ip next-hop

set ip next-hop *ip-address* *weight* ...*ip-address* *weight*
 no set ip next-hop *ip-address* *weight* ...*ip-address* *weight*

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>	
<i>weight</i>	

set ip next-hop *ip-address* *weight* ...*ip-address* *weight*
 no set ip next-hop *ip-address* *weight* ...*ip-address* *weight*

A collection of various mathematical symbols including Greek letters, subscripts, superscripts, and special characters.

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й А

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3	
route-map	18
match ip address	7
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
```

δ 3 Ô

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route-map	h8
match ip address	7
set default interface	~
set default interface	~
set interface	
set ip default next-hop	Ю ~
set ip precedence	"I

35.1.40 set ip precedence

```
7
3 set ip precedence ^ 3 no ~ "I
^
```

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

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3.1.1.1

1

3.1.1.2

1

3.1.1.3

3.1.1.4

1.1.1.1 1.1.1.2 1.1.1.3 1.1.1.4

```
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
```

3.1.1.5

3.1.1.5	
match interface	1.1.1.1 1.1.1.2
match ip address	1.1.1.1
match ip next-hop	1.1.1.1 1.1.1.2
match ip route-source	1.1.1.1
match metric	1.1.1.1
match route-type	1.1.1.1
match tag	1.1.1.1
set metric-type	1.1.1.1
set tag	1.1.1.1

35.1.43 set local-preference

1

<i>number</i>	"l Â ' "
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```
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
```

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-	$\qquad \qquad \qquad \hat{\quad} \qquad \qquad \Theta \qquad \tilde{\quad}$

match ip address	7
match ip next-hop	7 Ю
match ip route-source	7
match metric	7
match route-type	7
match tag	7
set metric-type	↑
set tag	↑

35.1.45 set metric-type

7
set metric-type $\hat{A}$ 3 no $\hat{A}$ 3

set metric-type *type*

no set metric-type

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<i>type</i>	↑

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 ∪ ↑ ∪ $\hat{A}$ ↑ ↓
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 ↑ ∼ ∼ 8 $\hat{A}$
 ∼ ↓ ∪ match 3 set 3
 a set 3 $\hat{A}$ match 3 7 set 3
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```
router ospf
```

```
redistribute rip subnets route-map redrip
```

```
network 192.168.12.0 0.0.0.255 area 0
```

```
0 -1.446 T0 route-map redrippermit0 1p typ (type1p )Tj0Gf021 w1 1M(
```

35.1.46 **route-map** *name* *action*

match *interface* *interface-name*

match *ip address* *ip-address*

match *ip next-hop* *ip-address*

match *ip route-source* *ip-address*

match *metric* *metric-value*

match *route-type* *route-type*

match *tag* *tag-value*

set *metric-type* *metric-type*

set *tag* *tag-value*

35.1.47 **route-map** *name* *action*

match *interface* *interface-name*

match *ip address* *ip-address*

match *ip next-hop* *ip-address*

match *ip route-source* *ip-address*

match *metric* *metric-value*

match *route-type* *route-type*

match *tag* *tag-value*

set *metric-type* *metric-type*

set *tag* *tag-value*

35.1.48 **route-map** *name* *action*

35.1.48	35.1.49
match interface	35.1.50
match ip address	35.1.51
match ip next-hop	35.1.52
match ip route-source	35.1.53
match metric	35.1.54
match route-type	35.1.55
match tag	35.1.56
set metric-type	35.1.57
set tag	35.1.58

35.1.47 set origin

35.1.47 **route-map** *name* *action*

set origin *origin*

set origin *origin* *origin*

no set origin

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```
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
```

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3	
match as-path	7
match metric	7
match origin	7
set as-path prepend	↑
set metric	↑
set local-preference	↑ "1

35.1.48 set originator-id

```

    {
        set originator-id <ip-addr>
        no originator-id <ip-addr>
    }

```

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<i>ip-addr</i>	

ð Ô

<ip-addr>

ð { Ô

<ip-addr>

ð Ô

```

    {
        <ip-addr>
    }

```

ð Ô

```

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

```

ð { Ô

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

35.1.49 set tag

```

    {
        no
    } set tag <tag>

```


35.1.50 set weight7

set community	↑
set metric	↑
set metric-type	↑

[illegible]

```

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
```

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

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

```
3 show route-map ^
```

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show ip community-list *community-list-number community-list-name*

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<i>community-list-number</i>	1 Â
<i>community-list-name</i>	1

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```
ЛЮ й show ip route }
```

```
Ruijie# show ip route
```

Codes: C - connected, S - static, R - RIP, B - BGP

0 - 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
```

```
0 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 {
```

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[illegible]

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

35.2.6 show ip ref

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0 3 0

0 0

1 1 3 6

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0 0

```
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
-----:
,
```

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36

36.1

36.1.1 ip policy route-map

3 ip policy route-map $\hat{A}$

3 no

$\hat{A}$

ip policy route-map *route-map*

no ip policy route-map

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<i>route-map</i>	↓ $\hat{A}$

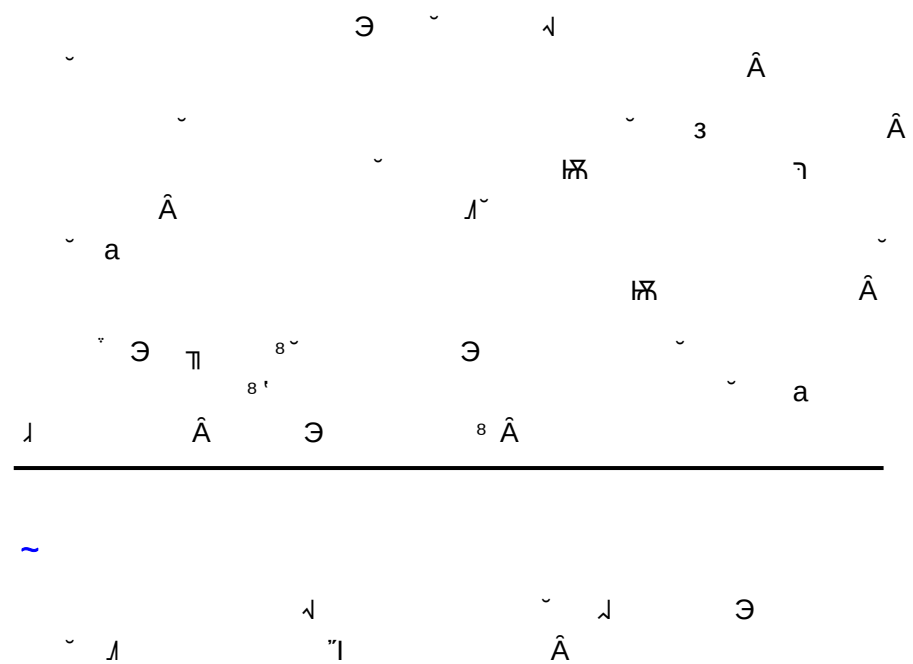
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```
access-list 1 permit 10.0.0.1
access-list 2 permit 20.0.0.1
route-map lab1 permit 10
match ip address 1
set ip next-hop 196.168.4.6
exit
route-map lab1 permit 20
match ip address 2
set ip next-hop 196.168.5.6
exit
interface FastEthernet 0/0
ip policy route-map lab1
exit
```

8 3 0

3	
access-list	№ А
route-map	№ А
set ip next-hop	№ Ю
set ip default next-hop	№ Ю
set interface	№
set default interface	№
set ip tos	
set ip dscp	
set ip precedence	"1
match ip address	

set ip nexthop

IO ip policy $\hat{A}$ 3 no
 $\hat{A}$

ip policy load-balance|redundance

no ip policy

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load-balance redundance	

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set ip next-hop

set ip next-hop

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[illegible]

```
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
```

```
ip policy route-map lab1
exit
ip policy redundancy
```

37 IPv6

37.1

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- › 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

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ping ipv6 ipv6-address

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ipv6-address '

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eui-64 '

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no ipv6 address a é ~ æ
Âno ipv6 address ipv6 prefix prefix-length eui-64 ↓ Л
3 ipv6 address ipv6-prefix prefix-length eui-64 Â

ð Ô

```

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

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ipv6 enable

no ipv6 enable

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3 ↓ Л 3 П ~ Ю ipv6 enable
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no ipv6 enable

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

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3	
show ipv6 interface	

37.1.4 ipv6 hop-limit

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ipv6 hop-limit value

no ipv6 hop-limit

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

37.1.5 ipv6 neighbor

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

no ipv6 neighbor *ipv6-address interface-id*

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ipv6-address ' ~ 18

interface-id ' ^

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hardware-address ' ^

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        A

```

```

d      O
        Ruijie(config)# no ipv6 source-route

```

37.1.7 ipv6 route

```

3      ~      3
        A
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

```

```

d      O
        ipv6-prefix '      Л~
        prefix-length      ~      71 Э

```

```

~
        ~      Л      A

```

```

        ipv6-address '      Ю      ~
        AЮ      j Л Ю      j      A
        Ю      ~      ж      A
        interface-id '      ~
        Ю      ~      ж      y      A
        Э      ~      ж      A
        Ю      ~      ж      A

```

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d      3      O

```

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d      O
        '      Ю      ж
        3      Ю      ≠
        A      Ю      a      ~

```


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

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3	
show ipv6 route	

37.1.8 ipv6 ns-linklocal-src

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 I' no ipv6 ns-linklocal-src I' ÿ Â ÿ
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ipv6 ns-linklocal-src

no ipv6 ns-linklocal-src

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Ruijie(config)# **no ipv6 ns-linklocal-src**

37.1.9 ipv6 nd ns-interval

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ipv6 nd ns-interval milliseconds

no ipv6 nd ns-interval

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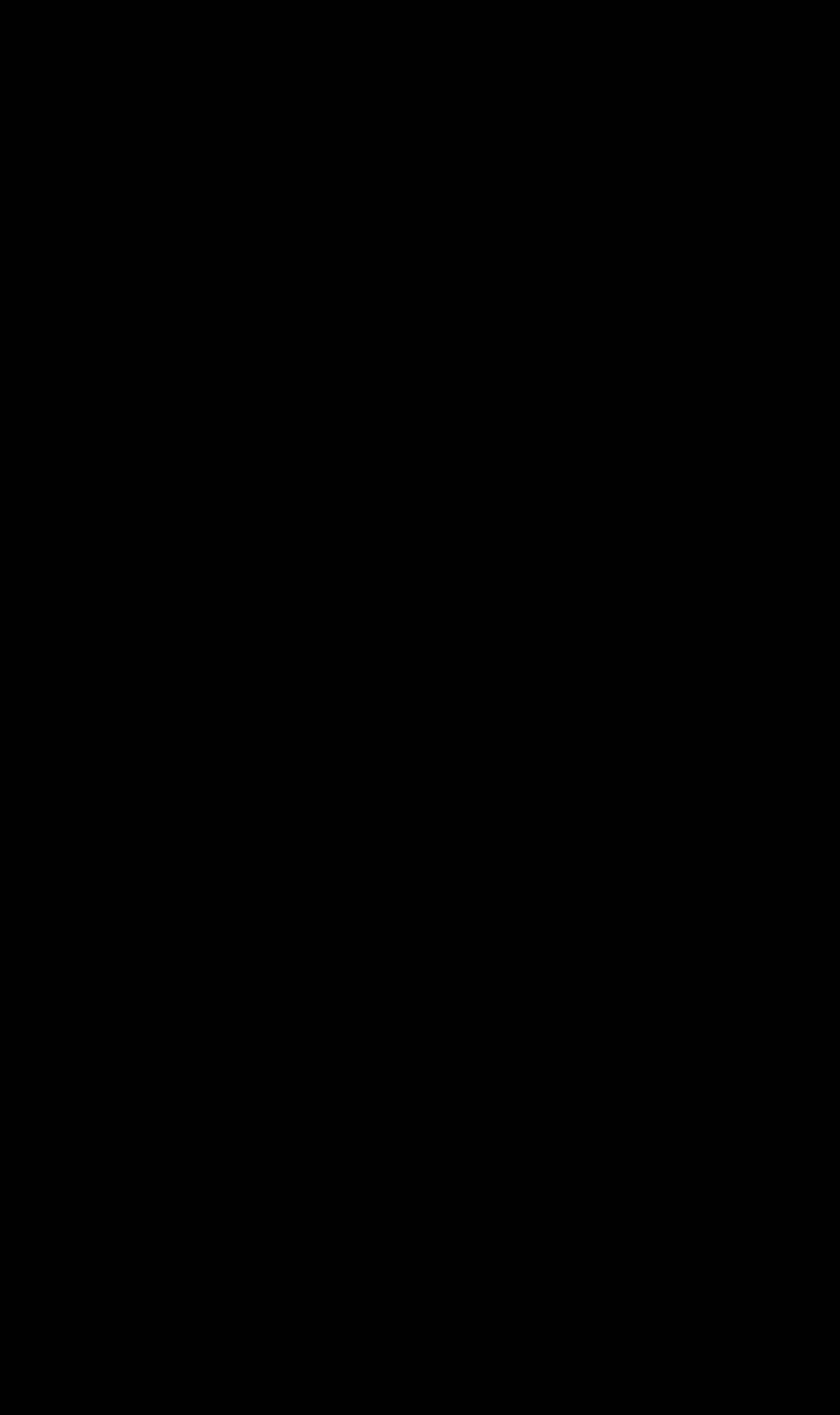
Ruijie(config-if)# **ipv6 nd ns-interval 2000**

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yG5YapbXTcEHEnXVpBWEaqlEwP(X@AñDif3DRTEuH(DK657hB

3

ipv6 nd prefix default



```

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	r
3		

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

37.1.16 ipv6 nd managed-config-flag

configuration { Ω managed address
Æ ~ { Æ Â

ipv6 nd managed-config-flag

no ipv6 managed-config-flag

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Ruijie(config)# int vlan 1

Ruijie(config)# ipv6 nd managed-config-flag

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

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tunnel source	
tunnel destination	
tunnel ttl	

37.1.22 tunnel destination

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tunnel destination *ipv4-address*

no tunnel destination

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37.2.1 show ipv6 route

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show ipv6 route static local connected

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static '

local '

connected '

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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

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```
Ruijie# show ipv6 interface vlan 1
```

```
Interface vlan 1 is Up, ifindex: 2001
```

```
address(es):
```

Mac Address: 00:00:00:00:00:00:01

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::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

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```
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

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	$\mathcal{A} \quad \Theta$ $\mathcal{G} \Theta \quad \downarrow$

38 OSPFv3

38.1

38.1.1 area default-cost

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

ð Ô

<i>area-id</i>	<i>cost</i>
<i>cost</i>	

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`default-cost` ò Â

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`area area-id default-cost cost`

ð Ô

`ipv6 router ospf 1`

`area 50 stub`

`area 50 default-cost 100`

ð ð Ô

<i>area stub</i>	<i>cost</i>
<code>show ipv6 ospf area</code>	

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*

0 0

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

0 0

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

0 3 0

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

0 0

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

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

0 0

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

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

0 3 0

discard-route	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
summary-prefix	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

38.1.3 area stub

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```

3
    1
3 ~ 1
Ю 3 ipv6 ospf cost 1
    1

```

3 1

```

Ю ~
    1
ipv6 router ospf 1
auto-cost reference-bandwidth 5

```

3 1

3	
show ipv6 ospf	1

38.1.6 clear ipv6 ospf process

```

3
    1
clear ipv6 ospf process | process-id

```

3 1

process-id	1

3 1

```

    1

```

3 1

```

Ю ~
3 1

```

3 1

```

Ю ~
    1
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*

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always	^ ↓ ~ a Â
metric <i>metric</i>	^ ↓ ~ ÿ Â
metric-type <i>type</i>	^ ↓ ~ Â ч ' ~ a ↓ Э a ' ~ Â ↓ Â ÿ Â
route-map <i>map-name</i>	↓

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redistribute **default-information** 3 ~
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redistribute ~
 Â **default-information originate**

3 Â

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~ ↓ √ **show ipv6 ospf database**

~ ÿ Â

show ipv6 route 3 ~ ↓ √ Â

~ ↓ **default-information originate**

3 √ a 3 **default-metric** Â

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```

router(config)# default-information originate always

```

Router#

redistribute	↑ A
show ipv6 ospf	A
show ipv6 ospf database	A

38.1.8 default-metric

```

router(config)# default-metric metric-value
router(config)# no default-metric

```

Router#

metric-value	↑ A ~ ñ A

```

router(config)# redistribute
router(config)# default-information originate
router(config)# default-metric 10

```

Router#

redistribute	↑ Â
show ipv6 ospf	Â

38.1.9 ipv6 ospf area

3 6 ~ 3 no
 11 Â

ipv6 ospf *process-id* **area** *area-id* **instance** *instance-id*

no ipv6 ospf *process-id* **area** *instance* *instance-id*

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<i>process-id</i>	1
area <i>area-id</i>	6 11 Â è 11 11 11 Â
instance <i>instance-id</i>	

ð Ô

11 Â

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3 6 ~ 3 **ipv6**
router ospf 11 11 11 Â
no ipv6 ospf area 3 a 11 6 Â
no ipv6 router ospf 3 a 11 6 Â
 11 *instance-id* 11 Â
 3 11 3 6 Â

ð Ô

10 ~ 3 11 ~ 6
 11 11

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


38.1.11 ipv6 ospf dead-interval

Эта команда используется для задания времени ожидания без ответа от соседа в режиме IPv6 OSPF. По умолчанию время ожидания без ответа от соседа составляет 40 секунд. Если время ожидания без ответа от соседа не задано, то используется значение по умолчанию.

ipv6 ospf dead-interval *seconds* **instance** *instance-id*
no ipv6 ospf dead-interval **instance** *instance-id*

где *seconds* — время ожидания без ответа от соседа в секундах.

Команда	Значение по умолчанию
ipv6 ospf dead-interval <i>seconds</i> instance <i>instance-id</i>	40
no ipv6 ospf dead-interval instance <i>instance-id</i>	40

где *instance-id* — идентификатор экземпляра OSPF.

ip ospf hello-interval *seconds*

где *seconds* — время ожидания без ответа от соседа в секундах.

По умолчанию время ожидания без ответа от соседа составляет 40 секунд.

где *seconds* — время ожидания без ответа от соседа в секундах.

Эта команда используется для задания времени ожидания без ответа от соседа в режиме IPv4 OSPF. По умолчанию время ожидания без ответа от соседа составляет 40 секунд. Если время ожидания без ответа от соседа не задано, то используется значение по умолчанию.

Эта команда используется для задания времени ожидания без ответа от соседа в режиме IPv4 OSPF. По умолчанию время ожидания без ответа от соседа составляет 40 секунд. Если время ожидания без ответа от соседа не задано, то используется значение по умолчанию.

где *seconds* — время ожидания без ответа от соседа в секундах.

Эта команда используется для задания времени ожидания без ответа от соседа в режиме IPv4 OSPF. По умолчанию время ожидания без ответа от соседа составляет 40 секунд. Если время ожидания без ответа от соседа не задано, то используется значение по умолчанию.

ipv6 ospf dead-interval 60

где *seconds* — время ожидания без ответа от соседа в секундах.

Команда	Значение по умолчанию
ipv6 ospf hello-interval	40
show ipv6 ospf interface	40
instance <i>instance-id</i>	

38.1.12 ipv6 ospf hello-interval

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ipv6 ospf network point-to-point
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ipv6 ospf priority	"1 100
show ipv6 ospf interface	100
instance <i>instance-id</i>	

38.1.15 ipv6 ospf priority

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ipv6 ospf priority *number-value* **instance** *instance-id*

no ipv6 ospf priority instance *instance-id*

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<i>number-value</i>	"l Â ~ ñ Â
instance <i>instance-id</i>	

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ipv6 ospf network	^
router-id	^
show ipv6 ospf interface	^
instance <i>instance-id</i>	

Имя интерфейса, на котором будет выполняться команда. Если не указать имя интерфейса, команда будет выполняться на всех интерфейсах.

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ipv6 ospf retransmit-interval 10

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Команда	Описание
show ipv6 ospf interface	Показать конфигурацию OSPF на интерфейсах
instance <i>instance-id</i>	Указать идентификатор экземпляра OSPF

38.1.17 ipv6 ospf transmit-delay

Имя интерфейса, на котором будет выполняться команда. Если не указать имя интерфейса, команда будет выполняться на всех интерфейсах.

ipv6 ospf transmit-delay *seconds* **instance** *instance-id*

no ipv6 ospf transmit-delay **instance** *instance-id*

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Параметр	Описание
<i>seconds</i>	Задержка в секундах перед передачей пакета. Значение по умолчанию — 1 секунда.
instance <i>instance-id</i>	Указать идентификатор экземпляра OSPF

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show ipv6 ospf interface	Â

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detail

38.1.21 passive-interface

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passive-interface default *interface-type interface-number*

no passive-interface default *interface-type interface-number*

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redistribute *protocol* **metric** *metric-value* **metric-type**

type-value **route-map** *map-tag* **match** **internal** **external**

nssa-external

no redistribute *protocol* **metric** **metric-type** **route-map** **match**

internal **external** **nssa-external**

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router-id 1.1.1.1

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ipv6 ospf priority	л А
show ipv6 ospf	А

38.1.24 timers spf

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timers spf delay holdtime

no timers spf

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<i>holdtime</i>	$\ddot{y}$	$\downarrow$	$\parallel$	$\sim$	$\hat{A}$
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```
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
```

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```
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
```

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ipv6 router ospf		Â
default-information originate	†	Â
default-metric	†	Â
<i>router-id</i>		Â
timers spf	~ л ч	↓ ~ Â

38.2.2 show ipv6 ospf database

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show ipv6 ospf process- id database lsa-type adv-router
router-id

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<i>lsa-type</i>	~ лЮ ' ã ã ã ã ã ã ã
adv-router router-id	Â

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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	0x7cd80
0.0.0.5	2.2.2.2	206	0x80000001	0x8c860

Link-LSA (Interface Loopback 1)

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```
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
```

6 BFD ||, x 3 7 1 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
```

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ipv6 router ospf	Â


```

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 6, 8 7 10

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

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ipv6 router ospf	Â
ipv6 ospf area	6 Â
area virtual-link	Â
show ipv6 ospf interface	Â

38.2.5 show ipv6 ospf route

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show ipv6 ospf process-id route count

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process-id	1
count	

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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

3 3 3

3

```

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   --

```

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ipv6 router ospf	Â
area range	ψ

38.2.7 show ipv6 ospf virtual-links

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show ipv6 ospf process-id virtual-links
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process-id	Λ

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```

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

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39 IGMP

39.1 IGMP

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IO      3      '
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, 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
```

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clear ip igmp group *group-address interface-type interface-number*

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group-address

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Ruijie# **clear ip igmp interface eth1**

39.1.3 ip igmp access-group

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ip igmp access-group access-list

no ip igmp access-group

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access-list	⑤ ⑥

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Ruijie# **configure terminal**

Ruijie(config)# **access-list 1 permit**

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39.1.7 ip igmp last-member-query-count

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last-member-query-count

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Ruijie# configure terminal
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Ruijie(config)# interface ethernet 0
```

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Ruijie(config-if)# ip igmp last-member-query-count 3
```

39.1.8 ip igmp last-member-query-interval

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ip igmp last-member-query-interval *interval*

no ip igmp last-member-query-interval

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ip igmp

last-member-query-count

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Ruijie# configure terminal
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Ruijie(config)# interface eth 0
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Ruijie(config-if)# ip igmp last-member-query-interval
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ip igmp query-interval *seconds*

no ip igmp query-interval

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Ruijie(config-if)# **ip igmp query-interval** 120

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Ruijie(config-if)# **no ip igmp query-interval**

39.1.11 ip igmp query-max-response-time

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ip igmp query-max-response-time *seconds*

no ip igmp query-max-response-time

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

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Ruijie^ config~ # ip igmp limit 300

39.1.16 ip igmp proxy-service

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ip igmp mroute-proxy interfname
```

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no ip igmp mroute-proxy
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```
Ruijie(config-if)# ip igmp mroute-proxy fa 0/1
```

39.1.18 ip igmp ssm-map enable

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```
ip igmp ssm-map enable
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```
no ip igmp ssm-map enable
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Â      λ      ~ || 8 π      Â
λ      λ  ip igmp ssm-map static
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igmp ssm-map π  Â
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```
Ruijie(config)# ip igmp ssm-map enable
```

39.1.19 ip igmp ssm-map static

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ip igmp ssm-map static *access-list a.b.c.d*

no ip igmp ssm-map static *access-list a.b.c.d*

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<i>access-list</i>	√ й
<i>a.b.c.d</i>	

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<i>interface-number</i>	1
detail	

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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

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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

3

显示 配置

<i>interface-type</i>	
<i>interface-number</i>	1

显示 配置

显示 配置

```

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

显示 配置 命令

show ip igmp ssm-mapping *A.B.C.D*

显示 配置

<i>A.B.C.D</i>	

显示 配置

^

显示 配置

40 PIM-DM

40.1 PIM-DM

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```

, 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

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ip pim dense-mode

no ip pim dense-mode

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```

Ruijie# configure terminal
Ruijie(config)# interface fastethernet 0/1
Ruijie(config-if)# ip pim dense-mode

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ip pim neighbor-filter

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```
ip pim state-refresh disable
```

```
no ip pim state-refresh disable
```

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          9      Â
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Ø      Ô
```

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          9      ~
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```

```
Ø      Ô
```

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```

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          9      Â
```

```
Ruijie# configure terminal
```

```
Ruijie(config)# ip pim state-refresh disable
```

```
~
```

```
ip pim state-refresh disable 3
```

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a      ~      Л      Ю      a
          9      П      Â
```

40.1.5 ip pim state-refresh origination-interval

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state-refresh origination-interval 3 Â      ч      ip pim
          Â      3      Л      9      й
          Â
```

```
ip pim state-refresh origination-interval interval-seconds
```

```
no ip pim state-refresh origination-interval
```

```
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```

<i>interval-seconds</i>	√ ~ Æ й Â

```

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}

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

```

show ip pim dense-mode
interface 3 A
show ip pim dense-mode interface interface-type interface-number
[ detail ]

```

interface-type interface-number	1
detail	

```

3
}

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

```

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show ip pim dense-mode neighbor	

40.1.7 show ip pim dense-mode neighbor

show ip pim dense-mode neighbor

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show ip pim dense-mode neighbor *interface-type interface-number*

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<i>interface-type interface-number</i>	/1

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№Ю ã **show ip pim dense-mode neighbor** 3

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

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40.1.8 show ip pim dense-mode nexthop

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show ip pim dense-mode nexthop

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show ip pim dense-mode nexthop

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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

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Решение

```
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

ЛЮЮ }'

- › 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

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clear ip mroute *group_address source_address*

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*	Â
<i>group_address</i>	Â
<i>group_address</i> <i>source_address</i>	Â

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```
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

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clear ip mroute statistics *group_address source_address*

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<i>group_address</i>	$\hat{A}$
<i>group_address</i> <i>source_address</i>	$\hat{A}$

0 3 0

0 0

||

0 0

```
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

0 3 0

```
clear ip pim sparse-mode bsr rp-set *
```

0 0

*	$\hat{A}$

0 3 0

0 0

|| || ^ $\hat{A}$

0 0

```
Ruijie# clear ip pim sparse-mode bsr rp-set *
```

41.1.4 ip multicast-routing

0 3 0

```
ip multicast-routing
```

0 0

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0 3 0

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<i>interface-type interface-number</i>	
<i>hash-mask-length</i>	↓ ~ ↓ ÿ ~ ÿ 8 ~
<i>priority-value</i>	↓ ~ ↓ ÿ ~ "I ~

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<i>access-list</i>	
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```
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
```

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access-list

41.1.8 ip pim dr-priority

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ip pim dr-priority *priority-value*

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<i>priority-value</i>	"l ~ "l Â ì ' ~ ì' Â

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```
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

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```
Ruijie# configure terminal
Ruijie(config)# ip pim ignore-rp-set-priority
```

41.1.10 ip pim jp-timer

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ip pim jp-timer *interval-seconds*

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<i>interval-seconds</i>	✓ ~ Æ Й

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```
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
```

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access-list

41.1.13 ip pim query-interval

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ip pim query-interval *interval-seconds*

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<i>interval-seconds</i>	А Й АЕ Й

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Ruijie#


```
Ruijie(config)# ip pim register-rp-reachability
```

41.1.16 ip pim register-source

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```
ip pim register-source local_address interface-type
interface-number
```

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<i>local_address</i>	"A
<i>interface-type</i> <i>interface-number</i>	ÿ "A

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```
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

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```
ip pim register-suppression seconds
```

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<i>seconds</i>	"À ¸ ~ √ ~ Æ ÿ Â

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Ruijie# **configure terminal**
Ruijie(config)# **ip pim register-suppression 100**

41.1.18 ip pim rp-address

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ip pim rp-address *rp-address access_list*

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<i>rp-address</i>	
<i>access_list</i>	√ ~ ' ÿ ã Â ¸ √ Â ~ Â

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Ruijie# **configure terminal**

Ruijie(config)# **ip pim rp-B74B3/0 1 12 0 j/0 1 12 0kat rp-B74B43/11**

Neighbors:
30.30.100.1

41.1.27 show ip pim sparse-mode local-members

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show ip pim sparse-mode local-members *interface-type*
interface-number

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<i>interface-type</i>	↓ ~
<i>interface-number</i>	~ ƒ

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show in pim sparse-mode neighbor [detail]

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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

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

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clear ip mroute * *group-address* *source -address*

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<i>group-address</i>	Â
<i>group_address</i> <i>source_address</i>	Â

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Ruijie# **clear ip mroute** 230.0.0.1

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show ip mroute	Â

42.1.2 clear ip mroute statistics

3

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clear ip mroute statistics * *group-address* *source -address*

3

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<i>group_address</i>	Â
<i>group_address</i> <i>source_address</i>	Â

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Ruijie# **clear ip mroute statistics** *230.0.0.1*

3

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show ip mroute
clear ip mroute

42.1.3 ip mroute

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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

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<i>source-address</i>	
<i>mask</i>	
<i>protocol</i>	^ ↓ ~
<i>rpf-address</i>	
<i>interface-type</i> <i>interface-number</i>	Λ
<i>distance</i>	$\hat{A}$ $\tilde{\alpha}$ $\tilde{\eta}$ $\downarrow$ η

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<i>limit</i>	т â и â
<i>threshold</i>	^ ↓ ~ â и

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threshold ' и

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d 3      O
      A
d      O
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      ~ J L
      ~ J a y b e A y
      a y e A y
d      O
      L y O e y
Ruijie(config-if)# ip multicast ttl-threshold 5

```

42.1.6 ip multicast-routing

```

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ip multicast-routing
no ip multicast-routing
d      O
      A
d 3      O
      A
d      O
      3 || A || ~
      ≠ a || A
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      A y ' || J L
      || A a
      || A

```


Incoming interface: FastEthernet 2/1

Outgoing interface list:

FastEthernet 1/3

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```
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			

0 3 0

0 0

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0 0

Ruijie# **debug nsm mcast fib-msg**

42.2.3 debug nsm mcast vif

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debug nsm mcast vif

0 0

0 3 0

0 0

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0 0

Ruijie# **debug nsm mcast vif**

42.2.4 debug nsm mcast register

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debug nsm mcast register

0 0

0 3 0

```

    3
    0      0
          ~  3  0
          0
    0      0
          0      0
    Ruijie# debug nsm mcast register
  
```

42.2.5 debug nsm mcast stats

```

          0
          3  no
    debug nsm mcast stats
    0      0
    0  3  0
    0      0
          ~  3  0
          0
    0      0
    Ruijie# debug nsm mcast stats
  
```

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show storm-control 3 ^

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Ruijie# **configure terminal**

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

Ruijie(config-if)# **storm-control multicast 4096**

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

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show storm-control	8 ^

43.1.2 switchport protected

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switchport protected

no switchport protected

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show interfaces 3

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```
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# switchport protected
```

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3	
show interfaces	Â

43.1.3 protected-ports route-deny

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protected-ports route-deny

no protected-ports route-deny

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й ~ ↓Л ~
3 ~ a Â **show running-config**
3

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```
Ruijie(config)# protected-ports route-deny
```

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show running-config	3 ↓Л

43.1.4 switchport port-security

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switchport port-security violation protect restrict shutdown

no switchport port-security violation

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```
switchport port-security mac-address mac-address ip-address
ip-address ipv6-address maximum value
```


no | default arp-check auto

0 0

cpu

auto :

0 0

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0 3 0

A

0 0

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0 0

Ruijie(config-if)# arp-check

0 3 0

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show port-security	A

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, show storm-control

, show port-security

43.2.1 show storm-control

8 A

show storm-control interface-id

0 0

interface-id	8 A

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8 3 Ô

8 Ô

```
Ruijie# show storm-control gigabitethernet
Interface Broadcast Control Multicast Control Unicast
Control
-----
```

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43.2.2 show port-security

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```
show port-security address interface interface-id
```

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8 Ô

```
Ruijie# show port-security
Secure Port MaxSecureAddr(count) CurrentAddr(count)
Security Action
-----
Gi1/1 128 1 Restrict
```

Gi1/2 128 0 Restrict

Gi1/3 8 1 Protect

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switchport port-security	Â ¨
switchport port-security aging	Ï Æ Â
switchport port-security mac-address	Â

44 802.1X

44.1 dot1x

Этот раздел описывает команды, которые используются для настройки протокола 802.1X.

- **dot1x auto-req**
- **dot1x auto-req packet-num**
- **dot1x auto-req req-interval**
- **dot1x auto-req user-detect**

44.1.1 dot1x auto-req

Эта команда используется для включения протокола 802.1X на интерфейсе. Команда **no dot1x auto-req** отменяет эту настройку.

no dot1x auto-req

Включение протокола 802.1X на интерфейсе.

Эта команда используется для включения протокола 802.1X на интерфейсе.

Включение протокола 802.1X на интерфейсе.

3	
show dot1x auto-req	ŷ

44.1.2 dot1x auto-req packet-num

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dot1x auto-req packet-num num

no dot1x auto-req packet-num

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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

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```

Ruijie# 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 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

```

dot1x timeout quiet-period seconds
no dot1x timeout quiet-period

```


seconds' Â Â Æ Â

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↓↵ **show dot1x** 3 Â

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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

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3	
show dot1x	

44.2.3 dot1x timeout server-timeout

no 3 L Â 3

no й Â

dot1x timeout server-timeout *seconds*

no dot1x timeout server-timeout

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seconds

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show dot1x

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Ruijie# **configure terminal**

Ruijie(config)# **dot1x timeout server-timeout 10**

Ruijie(config)# **end**

Ruijie# **show dot1x**

802.1X Status: Enabled
Authentication Mode: EAP-MD5
Authenticated 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 Online Probe: Disabled
Eapol Tag Enable: Disabled
Authorization Mode: Group Server

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3	
show dot1x	

44.2.4 dot1x timeout supp-timeout

```

 Ruijie# dot1x timeout supp-timeout seconds
 Ruijie# no dot1x timeout supp-timeout

 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

```

3	
show dot1x	

44.2.5 dot1x timeout tx-period

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		Â	3	Ï	Â
		dot1x timeout tx-period <i>seconds</i>			
		no dot1x timeout tx-period			
ð	Ô				
		<i>seconds'</i>	Â	Â	
ð	Ô				

Authorization Mode: Group Server

⑧ ③ ①

③	
show dot1x	

44.3 dot1x

④①① ③

- ③ dot1x re-authentication
- ③ dot1x reauth-max

44.3.1 dot1x re-authentication

③ ① ③

no dot1x re-authentication

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⑧ ①

① ④ ③ ③ ① ①

⑧ ①

```

④①① ③
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

```



```

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

```

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show dot1x	

44.4 dot1x

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- , dot1x probe-timer
- , dot1x client-probe enable

44.4.1 dot1x probe-timer

```

dot1x probe-timer interval alive interval
no dot1x probe-timer

```

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no'
interval
alive'
interval'

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~ ↓ √ **show dot1x** }

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```
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
```

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Show dot1x probe-timer	

44.4.2 dot1x client-probe enable

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no dot1x client-probe enable

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```
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

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show dot1x	

44.5 dot1x

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default

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```
Ruijie(config)# dot1x auth-fail max-attempt 5
Ruijie(config)# end
Ruijie#write
```

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show dot1x
```

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dot1x default

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↓ √ **show dot1x** 3 Â

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

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3	
show dot1x	Â

44.5.7 dot1x dynamic-vlan enable

|| Â 3 **no** ↓ √

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dot1x dynamic-vlan enable
no dot1x dynamic-vlan enable

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↓ √ **show dot1x dynamic-vlan** 3 Â

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```
Ruijie# configure terminal
Ruijie(config)# interface gigabitEthernet 4/5
```

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

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3	
show dot1x	Â

44.5.8 dot1x guest-vlan

guest vlan Â 3 no ↓ √ Â

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dot1x guest-vlan vid
no dot1x guest-vlan
```

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3 ~ π ~ "l dot1x dynamic-vlan enable
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show running-config	Â
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44.5.9 dot1x eapol-tag

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dot1x eapol-tag

no dot1x eapol-tag

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↓ √ show dot1x ð Â

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Ruijie# **configure terminal**

Ruijie(config)# **dot1x eapol-tag**

Ruijie(config)# **end**

Ruijie#

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ð	
show dot1x	Â

44.5.10 dot1x mac-auth-bypass

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dot1x mac-auth-bypass

no dot1x mac-auth-bypass

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show dot1x port-control interface

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Ю

Ruijie# **configure terminal**Ruijie(config)# **interface fa 0/1**Ruijie(config-if)# **dot1x mac-auth-bypass**Ruijie(config-if)# **end**

Ruijie#write

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show dot1x port-control interface

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44.5.11 dot1x mac-auth-bypass timeout-activity

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dot1x mac-auth-bypass timeout-activity *value***no dot1x mac-auth-bypass timeout-activity***value*

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show run

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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
```

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3	
show dot1x port-control interface	Â

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44.5.12 dot1x mac-auth-bypass violation

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dot1x mac-auth-bypass violation

no dot1x mac-auth-bypass violation

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44.5.13 dot1x max-req

```

Ruijie# show dot1x
Ruijie# show dot1x no
Ruijie# show dot1x no

```

dot1x max-req count
no dot1x max-req

```

Ruijie# show dot1x count
Ruijie# show dot1x count

```

```

Ruijie# show dot1x count
Ruijie# show dot1x count

```

```

Ruijie# show dot1x count
Ruijie# show dot1x count

```

```

Ruijie# show dot1x count
Ruijie# show dot1x count

```

```

Ruijie# show dot1x count
Ruijie# show dot1x count

```

```

Ruijie# configure terminal
Ruijie(config)# dot1x max-req 7
Ruijie(config)# end
Ruijie#

```

```

Ruijie# show dot1x

```

3	
show dot1x	1

44.5.14 dot1x private-suppliant-only

no

`dot1x`

`dot1x private-supplicant-only`

`no dot1x private-supplicant-only`

`show`

`show`

`show`

`show`

`show`

`show dot1x private-supplicant-only`

`show`

`show`

`Ruijie# configure t`

`Ruijie(config)# dot1x private-supplicant-only`

`Ruijie(config)# end`

`Ruijie#`

`show`

show	show
show dot1x private-supplicant-only	show

44.5.15 dot1x port-control auto

`show`

`show`

`dot1x port-control auto`

`no dot1x port-control`

`show`

`show`

`show`

`show`

`show`

`show dot1x`

`show`

```

Ruijie# configure terminal
Ruijie(config)# interface g0/1
Ruijie(config-if)# dot1x port-control auto
Ruijie(config-if)# end
Ruijie#

```

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3	
show dot1x	Â

44.5.16 dot1x port-control-mode

```

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      8      ~      Ю
      √      8      Ю √
      √      ~      Â      8      Ю
      √ й      ~      ε      ~      Ю
      ~      Â      3      Ю

```

dot1x port-control-mode mac-based port-based single-host
no dot1x port-control-mode

δ Ô

```

mac-based '      8
port-based '      8
single-host '      8

```

δ Ô

й 8

δ 3 Ô

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δ Ô

```

√ √      show dot1x port-control 3      Â
      8 ~      show dot1x
port-control ∅      й      ~      show running-config
      й dot1x port-control-mode port-based single-host Â

```


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```
Ruijie# configure terminal
Ruijie(config)# dot1x stationarity enable
Ruijie(config)# end
Ruijie#
```

44.5.18 dot1x redirect url

dot1x redirect url *url-string*

no dot1x redirect url

<i>url-string</i>	

3

```
Ruijie(config)# dot1x redirect url http://ruijie.net/web
```

3	3	
	dot1x redirect for special tcp-destination port	й ~ й
	dot1x redirect time-out	
	dot1x redirect num for special source-ip	↵
	show dot1x	

no dot1x redirect num for special source-ip

	<i>num</i>	

--

3

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	й
	Ruijie(config)# dot1x redirect num for special source-ip 3

	3	
	dot1x redirect url	
3	dot1x redirect for special tcp-destination port	й ~ й
	dot1x redirect time-out	
	show dot1x	

1

3 1	1	
	-	

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

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show dot1x

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Ruijie# show dot1x

44.6.2 show dot1x auth-address-table

dot1x auth-mode	Â

dot1x max-req	Â
dot1x port-control auto	¶ Â
dot1x reauth-max	
dot1x re-authentication	Â
dot1x timeout quiet-period	 Â
dot1x timeout re-authperiod	Â
dot1x timeout server-timeout	 Â  A• Ä Â

dot1x port-control auto	on
dot1x reauth-max	
dot1x re-authentication	enable
dot1x timeout quiet-period	30
dot1x timeout re-authperiod	60
dot1x timeout server-timeout	120
dot1x timeout supp-timeout	60
dot1x timeout tx-period	30

44.6.4 show dot1x private-supPLICANT-only

on

show dot1x private-supPLICANT-only

on

on

on

on

on

Ruijie#

Ruijie# show dot1x private-supPLICANT-only

private-supPLICANT-only:: disabled

on

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

dot1x timeout quiet-period	1 s
dot1x timeout re-authperiod	s
dot1x timeout server-timeout	1 s
dot1x timeout supp-timeout	s
dot1x timeout tx-period	s

44.6.5 show dot1x max-req

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show dot1x max-req

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IO :

Ruijie# show dot1x max-req

max-req: 2 times

Ruijie#

o 3 o

3	
dot1x auth-mode	s
dot1x max-req	s
dot1x port-control auto	1 s
dot1x reauth-max	
dot1x re-authentication	s
dot1x timeout quiet-period	1 s
dot1x timeout re-authperiod	s

dot1x timeout server-timeout	⌥ Â
dot1x timeout supp-timeout	Â
dot1x timeout tx-period	Â

44.6.6 show dot1x port-control

6 Â

show dot1x port-control interface



dot1x timeout quiet-period	$\frac{1}{\hat{A}}$
dot1x timeout re-authperiod	$\hat{A}$
dot1x timeout server-timeout	$\frac{1}{\hat{A}}$
dot1x timeout supp-timeout	$\hat{A}$
dot1x timeout tx-period	$\hat{A}$

dot1x timeout quiet-period	$\frac{1}{\hat{A}}$
dot1x timeout re-authperiod	$\hat{A}$
dot1x timeout server-timeout	$\frac{L}{\hat{A}}$
dot1x timeout supp-timeout	$\hat{A}$
dot1x timeout tx-period	$\hat{A}$

dot1x quiet-period	timeout	1
dot1x re-authperiod	timeout	1
dot1x server-timeout	timeout	1
dot1x supp-timeout	timeout	1
dot1x timeout tx-period		1

44.6.10 show dot1x summary

3

show dot1x summary

0 0

1

0 3 0

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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#

0 3 0

3	
dot1x auth-mode	1
dot1x max-req	1
dot1x port-control auto	1 1

dot1x reauth-max	
dot1x re-authentication	^
dot1x timeout quiet-period	1 ^
dot1x timeout re-authperiod	^
dot1x timeout server-timeout	1 ^
dot1x timeout supp-timeout	^
dot1x timeout tx-period	^

44.6.11 show dot1x user id

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show dot1x user id id

0 0

id

0 0

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0 3 0

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0 0

0 0

IO

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
```

?	
dot1x auth-mode	^
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

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45.1.2 aaa au

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aaa authentication enable ⑩

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Ruijie(config)# **aaa authentication enable default group radius local**

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①	②
aaa new-model	③
enable	④
username	⑤

45.1.3 aaa authentication login

① ② ③

④ **aaa**

authentication login

⑤

⑥

⑦

aaa authentication login default list-name method1 method2

no aaa authentication login default list-name

⑧ ⑨

default ⑩

⑪

⑫

⑬

⑭

⑮

list-name ⑯

⑰

⑱

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method ㉒

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local	1
none	a
group	1 1

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0 3 0

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0 0

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aaa authentication login

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Ruijie(config)# aaa authentication login list-1 group radius local

0 3 0

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aaa new-model	1
username	10
login authentication	3

45.1.4 aaa authentication ppp

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authentication ppp

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```
aaa authentication ppp default list-name method1 method2
```

```
no aaa authentication ppp default list-name
```

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default '          ~  丅  𐀫          𐀹
      Â
```

```
list-name '  𐀫          ~  丅  𐀹          Â
```

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method '      𐀹          ~      ,
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local	丅
none	a
group	𐀹 𐀹 ~

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aaa authentication ppp 𐀹 丅
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  丅 ~          Â
```

```
Ruijie(config)# aaa authentication ppp rds_ppp group
radius local
```

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𐀹	
aaa new-model	𐀹
ppp authentication	
username	𐀫

- › **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

aaa authorization commands *level* **default** *list-name* *method1* *method2*

no aaa authorization commands *level* **default** *list-name*

ð Ô

level ' *level* *list-name* *method*

none	a
group	

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Ruijie(config)# aaa authorization commands 15 default
group tacacs+
```

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aaa new-model	£
authorization commands	3

45.2.2 aaa authorization config-commands

aaa authorization config-commands

no aaa authorization config-commands

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Ruijie(config)# **aaa authorization config-commands**

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

0 3 0

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aaa new-model	Е
authorization exec	3
username	ИИ

45.2.5 aaa authorization network

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 3 aaa authorization network Â 3
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aaa authorization network default list-name method1 method2
no aaa authorization network default list-name

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default ' ~ Л ИИ ì
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 method ' Ю ~ '

none	a
group	Е ~ Е

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⅃ ⅃ ⅃ ⅃ ⅃ ⅃ ⅃ ⅃ ⅃ ⅃

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

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⅃	
aaa new-model	⅃
aaa accounting	⅃
aaa authentication	⅃
username	⅃

$\begin{array}{ccccccc} & \exists & & \sim & || & \exists \hat{A} & \exists \\ & & \exists & & \vee \exists & \hat{A} & \\ \text{H} & & \sim & & & \exists & \\ & & \text{H} & \exists & & \hat{A} & a \end{array}$

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```

Ruijie(config)# aaa authorization exec exec-1 group
radius none
Ruijie(config)# line vty 0 4
Ruijie(config-line)# authorization exec exec-1

```

3 0

3	
aaa new-model	Е
aaa authorization commands	hX

45.3

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- » 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

```

aaa accounting commands level default list-name start-stop
method1 method2

no aaa accounting commands level default list-name

```

0 0

||[~] ||[~]
3 aaa accounting exec Â 3 ✓
π Â

3	
aaa new-model	└
aaa authentication	⌘
accounting commands	⊖

45.3.3 aaa accounting network

```

3 aaa accounting network ^
    ^
aaa accounting network default list-name start-stop group radius
no aaa accounting network default list-name

δ      Ô
network '          └          ~          ~          ^
resource '          ^
list-name '        ↓ ^
start-stop '       ||          ~
                    ^          ^
group '           └
radius '          └

δ      Ô
    ^
δ 3      Ô
    ^
δ      Ô
    ^
start-stop ~ 8          ^          ||          ^
δ      Ô
    ^
    ^
    ^
Ruijie(config)# aaa accounting network default
start-stop group radius

```

3

3	
aaa new-model	└
aaa authorization network	┌
aaa authentication	┌
username	┌

45.3.4 aaa accounting update

3 aaa accounting update
3
3

aaa accounting update

no aaa accounting update

3

3

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3

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3

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3

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Ruijie(config)# aaa new-model

Ruijie(config)#

3

3	
aaa new-model	└
aaa accounting network	┌

45.3.5 aaa accounting update periodic

periodic π $\hat{A}$ aaa accounting update
 $\hat{A}$

aaa accounting update periodic *interval*

no aaa accounting update periodic

δ $\hat{O}$

interval $\sim$ $\mathcal{U}$ $\mathfrak{y}$ $\mathfrak{A}$ $\mathfrak{y}$ $\mathfrak{f}$ $\hat{A}$

δ $\hat{O}$

$\hat{A}$

δ $\mathfrak{f}$ $\hat{O}$

$\hat{A}$

δ $\hat{O}$

$\mathfrak{L}$ a $\hat{A}$

```

level '          3      ~      ~  ā          3
      Â

```

```

default '          ~          3          Â

```

```

list-name '          𐌹  3          Â

```

```

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```

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```

      3      ~      ||      𐍂 Â      𐍂
      3      ~      𐍂  3      Â
      𐌹      ~      𐌹      3      Â
      ~      𐌹      3      Â

```

```

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```

```

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      𐌶      𐌶      𐌶      𐌶      𐌶      Â
      𐌶      𐍂

```

```

Ruijie(config)# aaa accounting commands

```

list-name '

⌘

∂ $\hat{O}$

$name' \quad \vdash \quad \forall J^{\sim} \quad a \quad \dot{\gamma} \quad I' \quad L^{\sim} \quad I' \quad L^{\sim}$
 $\dot{\gamma} \quad \vdash \quad J \quad \hat{A}$

 $\hat{A}$
$$\{ \quad \vdash \quad \vdash \quad \hat{A}$$

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Server List:

3	
show aaa group	E

$$\hat{Y} = \hat{L} \hat{A}$$

```
vrf-name ' 1
```

$$\mathbb{L} \quad \hat{A}$$

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```
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
```

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3	
aaa group server	Ì
show aaa group	Ì

45.4.3 server

¶ Ì Ì ~ Â

```
server ip-address auth-port port1 acct-port port2
no server ip-address auth-port port1 acct-port port2
```

ð Ô

```
ip-address '      Ì
port1 '      Ì      ^      Ì      ~
port2 '      Ì      ^      Ì      ~
```

ð Ô

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Ì Â

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```

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

```

ð 3 Ô

3	
aaa group server	└
show aaa group	└

45.4.4 show aaa group

└ Â

show aaa group

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3 Â

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```

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

ð 3 Ô

3	
aaa group server	£

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

ð Ô **aaa local authentication attempts** *max-attempts*

max-attempts ~ √ Â

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```
Ruijie# configure terminal
Ruijie(config)# aaa local authentication attempts 6
```

```
Ø      3 Ø
```

3	
show running-config	
show aaa logout	

45.5.2 aaa local authentication logout-time

```
aaa local authentication logout-time logout-time
```

```
Ø      Ø
```

```
logout-time ^ Æ' ~ √
```

```
Ø      Ø
```

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Й
```

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Ø 3 Ø
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```
Ø      Ø
```

```
Ø      Ø
```

```
Ю      '
```

```
Ruijie# configure terminal
Ruijie(config)# aaa local authentication logout-time
5
```

```
Ø      3 Ø
```

3	
show running-config	
show aaa logout	

45.5.3 aaa new-model

$\hat{A}$ $\{$ no $\models \hat{A}$ $\{$ aaa new-model
aaa new-model
no aaa new-model
 δ $\hat{O}$
 $\{$ $\hat{A}$
 δ $\hat{O}$
 $\models$
 δ $\{$ $\hat{O}$
 $\hat{A}$
 δ $\hat{O}$
 $\{$ $\{$ $\models \hat{A}$
aaa new-model $\models \hat{A}$
 $\{$ a $\downarrow$ $\hat{A}$
 δ $\hat{O}$
 $\models$ $\models \hat{A}$
Ruijie(config)# aaa new-model
 δ $\{$ $\hat{O}$

3	
aaa authentication	✖
aaa authorization	✖
aaa accounting	✖

45.5.4 t

clear aaa local user lockout all user-name word

3

^

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~ ↓ √ ≠ ↓ √

ð Ô

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Ruijie# clear aaa local user logout all

ð 3 Ô

3	
show running-config	
show aaa logout	

45.5.5 debug aaa

└ ^ 3 no ^

debug aaa event

no debug aaa event

ð Ô

^

ð 3 Ô

^

45.5.6 show aaa method-list

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show aaa method-list

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ð 3 Ô

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$\hat{A}$

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 $\hat{A}$

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
```

$$\partial \quad \quad \quad \partial$$

3	
aaa authentication	17
aaa authorization	17
aaa accounting	17

45.5.7

 $\hat{A}$

```
show aaa user lockout all user-name word
```

word '

 $\hat{A}$ $\sim \mathcal{L}$ $\hat{A}$

Ю

```
Ruijie# show aaa user lockout all
```

ð 3 Ô

3	
show running-config	
show aaa logout	

46 RADIUS

46.1 RADIUS

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- › **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

source-interface *interface* **no** **ip radius**

ip radius source-interface *interface*

no radius source-interface

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Interface

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[illegible]

⑧ ③ ⑥

③	
radius-server host	④ ⑤

46.1.3 radius-server host

⑤ ⑥ ⑦ ⑧ radius-server ⑨
 ③ no ④ ⑤ ⑥ ⑦ ⑧
radius-server host ip-address auth-port port-number acct-port
port-number
no radius-server host ip-address

⑧ ⑥

Hostname: ⑤ ⑥ ⑦ ⑧
 ip-address ⑤ ⑥ ⑦
 auth-port
 port-number ⑦ ⑧ ⑨ ⑩ ⑪
 a ⑫
 acct-port:
 port-number: ⑦ ⑧ ⑨ ⑩ a
 ⑫

⑧ ⑥

⑥ ⑦

⑧ ③ ⑥

⑦

⑧ ⑥

⑩ ⑪ ⑫ radius-server ⑬ ⑭ ⑮ ⑯ ⑰ ⑱

⑧ ⑥

⑩ ⑪ ⑫ ⑬ ⑭ ⑮
 Ruijie(config)# **radius-server host 192.168.12.1**

⑧ ③ ⑥

③	
---	--

aaa authentication	✕
radius-server key	✕ ƚ }
radius-server retransmit	✕
radius-server timeout	✕

46.1.4 radius-server key

✕ ƚ ^ ~ 6 ƚ
 }~ } radius-server key Â }

radius-server key 0 | 7 *text-string*

no radius-server key

ð Ô

text-string }

0 7 ' } ƚ ~ ƚ ~ ƚ Â

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} Â

ð }

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 } ƚ ƚ Â ÿ ƚ
 ƚ ƚ ƚ } Â

ð Ô

Ю ✕ ƚ } ÿ '

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

ð }

}	
radius-server host	✕ ƚ Ÿ
radius-server retransmit	✕
radius-server timeout	✕

3

46.1.5 radius-server retransmit

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3 radius-server retransmit Â 3 no
Â radius-serve

seconds'

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Ruijie(config)# radius-server timeout 10

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{	
radius-server host	℥ ↳ ÿ
radius-server retransmit	℥
radius-server key	℥ {

46.1.7 radius-server deadtime

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{
radius-server deadtime Â
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no
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radius-server deadtime minnutes

no radius-server deadtime

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minnutes'

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- › show radius server
- › show radius parameter
- › show radius vendor-specific

46.2.1 debug radius

```

Ruijie# debug radius event | detail
Ruijie# no debug radius event | detail

Ruijie#
Ruijie#

```

46.2.2 show radius server

```

Ruijie# show radius server

Ruijie#
Ruijie#
Ruijie#
Ruijie#
Ruijie#
Ruijie#

```

```

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

```

```

Ruijie#

```

3	
radius-server host	192.168.4.12 192.168.4.13

radius-server retransmit

178

radius-server key

178

0 3 0

Â

0 0

3

0 0

```
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+)

3

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?	
aaa authentication	⌘
tacacs-server key	⌘ ⌞ ?
tacacs-server timeout	⌘ ⌞

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3	
tacacs-server host	℔ ℓ ŷ
tacacs-server timeout	℔

47.1.7 tacacs-server timeout

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tacacs-server timeout *seconds*

no tacacs-server timeout

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seconds' ^ Æ ì ~ Â ∟ ì Â

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47.2.1 debug tacacs+

Â 3

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debug tacacs+

no debug tacacs+

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47.2.2 show tacacs

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show tacacs

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ð 3 Ô

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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

ð 3 Ô

3	
tacacs-server host	£ £ £ Ÿ

48 SSH

48.1 SSH

ЛЮ 3'

- ```
› crypto key generate
› crypto key zeroize
› ip ssh version
› ip ssh time-out
› ip ssh authentication-retries
```

### 48.1.1 crypto key generate

$$\mathbb{L} \quad \Omega \quad \sim \quad \mathbb{H} \quad \mathbb{Z}'$$

**crypto key generate rsa | dsa**

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|     |  |
|-----|--|
|     |  |
| rsa |  |
| dsa |  |

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$$\mathcal{H} \quad \mathcal{H}' \quad \mathcal{H}''$$
$$\tilde{O} \quad \{ \quad \hat{O}$$

Ố                      Ô

```
enable service ssh-server
```



~

~ a { no crypto key generate { crypto  
key zeroize { Â

ð Ô

Ruijie# **configure terminal**  
Ruijie(config)# **crypto key generate rsa**

ð { Ô

| show ip ssh                  | Â      |
|------------------------------|--------|
| crypto key zeroize rsa   dsa | 6<br>Â |

## 48.1.2 crypto key zeroize

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**crypto key zeroize rsa | dsa**

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| rsa |  |
|-----|--|
| dsa |  |

ð Ô

ð { Ô

ð Ô

{ £ Ω Â 1~ Ì  
no enable  
service ssh-server { Â

ð Ô

Ruijie# **configure terminal**

3

Ruijie(config)# **crypto key zeroize rsa**

0 3 0

|                             |     |
|-----------------------------|-----|
| 3                           |     |
| show ip ssh                 | Â   |
| crypto key generate rsa dsa | 6 Â |

### 48.1.3 ip ssh version

Â 3 ñ

ip ssh version 1 | 2  
no ip ssh version

0 0

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

| ?           |   |
|-------------|---|
| show ip ssh | Â |

#### 48.1.4 ip ssh time-out

ip ssh time-out ~~time-out~~ **no**

---

**ip ssh authentication-retries** *retry times*

**show ip ssh**

0 0

0 3 0

0 0

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0 0

Ruijie# **show ip ssh**

0 3 0

| 3                                            |   |
|----------------------------------------------|---|
| ip ssh version 1 2                           | À |
| ip ssh time-out time                         | À |
| ip ssh authentication-retries<br>retry times | À |

## 48.2.2 show ssh

À

**show ssh**

0 0

0 3 0

0 0

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à ¶ à à J À

0 0

Ruijie# **show ssh**

### 48.2.3 show crypto key mypubkey

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show crypto key mypubkey *rsaldsa*

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Ruijie# **disconnect ssh 1**

## 49 CPU

### 49.1

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- , **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-protect type** arp bpdu dhcp ipv6mc igmp rip ospf vrrp  
pim ttl1 unknown-ipmc dvmrp **pps** *pps\_value*

ð Ô

*pps\_value* ' Â

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Ruijie(config)# **cpu-pr type bpdu pps 100**  
Set packet type bpdu pps 100 .

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| 3                                                         |      |
|-----------------------------------------------------------|------|
| <b>cpu-protect type packet-type pri</b><br><i>pri_num</i> | "1 Â |

#### 49.1.2 cpu-protect type packet-type pri pri\_num

"1 Â

**cpu-protect type** arp bpdu dhcp ipv6mc igmp rip ospf vrrp  
pim ttl1 unknown-ipmc dvmrp **pri** *pri\_num*



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*pri\_num* ' ~ √ ~ ÷ ~

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```
Ruijie(config)# cpu-protect type bpdu pri 7
Set packet type bpdu pri 7.
```

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|                                                      |  |
|------------------------------------------------------|--|
| cpu-protect type packet-type<br>pps <i>pps_value</i> |  |
|------------------------------------------------------|--|

## 49.2

3

- **show cpu-protect mboard**
- **show cpu-protect slot** *slot-id*
- **show cpu-protect type** *packet-type*

### 49.2.1 show cpu-protect mboard

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```
show cpu-protect mboard
```

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$$\partial \quad \quad \quad \partial \hat{O}$$

|                                       |  |
|---------------------------------------|--|
| 3                                     |  |
| show cpu-protect slot <i>slot-num</i> |  |

## 49.2.2 show cpu-protect slot

```

Ruijie# show cpu-protect slot slot_num

```

```

Ruijie#

```

```

slot_num ' '

```

```

Ruijie#

```

```


```

```

Ruijie#

```

```


```

```

Ruijie#

```

| show cpu-protect mboard |  |
|-------------------------|--|

## 49.2.3 show cpu-protect type

```

Ruijie# show cpu-protect type arp bpdu dhcp ipv6mc igmp rip
ospf vrrp pim ttl1 unknown-ipmc dvmrp

```

```

Ruijie#

```

```


```

```

Ruijie#

```

```


```

```

Ruijie#

```

```

Ruijie# show cpu-protect type bpdu

```

```

Ruijie(config)# show cpu-protect type arp
Slot Type Pps Total Drop

MainBoard bpdu 100 30 0
Slot-2 bpdu 100 30 0

```

```

Ruijie#

```

|                              |  |
|------------------------------|--|
| <b>show cpu-protect type</b> |  |
|------------------------------|--|

*packet-type*

---

## 50

### 50.1

3

- › **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

π **Â** 3 **no** π

**system-guard enable**

**no system-guard enable**

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π

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π

Ruijie(config-if)# **system-guard enable**

π

Ruijie(config-if)# **no system-guard enable**

ð 3 Ô

| 3                        |   |
|--------------------------|---|
| <b>Show system-guard</b> | π |



|               |                                                                                                                                                                  |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>number</i> | $  \begin{array}{ccccccc}  & & a & & a & & \\  & \hat{A} \downarrow & & \downarrow & & & \downarrow \\  \downarrow & & \hat{A} & & a & & \hat{A}  \end{array}  $ |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|

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Ruijie(config)# **system-guard detect-maxnum 200**

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|---------------------|---|
| system-guard enable | П |





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**show system-guard interface *interface-id***

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| <b>interface <i>interface-id</i></b> |  |
|--------------------------------------|--|

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ø    3    Ô

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ø      Ô

ø      Ô

Ruijie# **show system-guard**

```
detect-maxnum number : 100 // Ÿ
isolated host number : 11 // Ÿ
interface state isolate time same-attack-pkts
scan-attack-pkts
```

```

Fa 0/1 ENABLE 120 20 10
Fa 0/2 DISABLE 110 21 11
```

.....

Ruijie# **show system-guard interface Fa 0/1**

```
detect-maxnum number : 100 // Ÿ
isolated host number : 11 // Ÿ
interface state isolate time same-attack-pkts
scan-attack-pkts
```

```

Fa 0/1 ENABLE 120 20 10
```

ø      3    Ô

| 3                          |   |
|----------------------------|---|
| <b>system-guard enable</b> | π |

## 50.2.2 show system-guard isolate-ip [interface *interface-id*]

^

**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

```

0 3 0

| 3                   |   |
|---------------------|---|
| system-guard enable | π |

## 50.2.4 show system-guard exception-ip [interface *interface-id*]

π Â

```
show system-guard exception-ip interface interface-id
```

0 0

| interface interface-id |  |
|------------------------|--|

0 3 0

Â

0 0

```

Ruijie# show system-guard exception-ip
Exception IP Address Exception Mask

255.255.255.0
192.168.4.11 255.255.255.0

```

0 3 0

| 3                   |   |
|---------------------|---|
| system-guard enable | π |

# 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

```

{ 8 11 ^
security gsn enable
no security gsn enable

0 0

0 3 0

0 0

^
0 0

Ruijie# configure terminal
Ruijie(config)# security gsn enable

```

### 51.1.2 security community

```

{ 11 1
security v1 | v2 community community v3 user username
no security v1 | v2 community community v3 user username

```



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}

ð      { Ô

| {                               |  |
|---------------------------------|--|
| <a href="#">show</a> smp-server |  |

#### 51.1.4 security event interval

}

security event interval *interval*

no security event interval

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*interval* '                  Y"                  Â

ð      Ô

ð { Ô

ð      Ô

{ Â      show security event interval                  Â  
l      ð      Ô                  Y"                  '

| {                                            |    |
|----------------------------------------------|----|
| <a href="#">show</a> security event interval | Y" |

#### 51.1.5 security address-bind enable

}

security address-bind enable

no security address-bind enable

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```

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```

Ruijie(config-if)# **security address-bind enable**

```

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```

| {                   |  |
|---------------------|--|
| security gsn enable |  |

## 51.2

```

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```

**show smp-server**

**show security event interval**

### 51.2.1 show smp-server

```

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```

```

δ Ô

```

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```

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```

```

Ruijie# show smp-server
SMP-Server IP' 192.168.20.30

```

```

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```

| {               |   |
|-----------------|---|
| smp-server host | Â |

### 51.2.2 show security event interval

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|                             |   |
|-----------------------------|---|
| 3                           |   |
| show ip arp inspection vlan | 1 |

NFPP( $\mu, \epsilon$ )  
WÄI(•ÄARP)

**53**

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### 53.1.3 show anti-arp-spoofing

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show anti-arp-spoofing

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show anti-arp-spoofing

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| 3                    |   |
|----------------------|---|
| anti-arp-spoofing ip | 3 |

## 54 IP Source Guard

### 54.1 IP Source Guard

IO 3 IO 3

, ip source binding

#### 54.1.1 ip source binding

~ IO 3 Â 3

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| 3                      |   |
|------------------------|---|
| show ip source binding | 7 |

## 54.2 IP Source Guard

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, ip verify source

|               |                |    |        |
|---------------|----------------|----|--------|
| FastEthernet  | 0/1            | ip | active |
| 192.168.4.243 | 00d0.f801.0101 | 1  |        |

|                       |  |
|-----------------------|--|
| 3                     |  |
| show ip verify source |  |

- **show ip verify source**
- **show ip source binding**
- **debug ip source bind**

```

show ip verify source interface interface-id

show ip verify source interface interface-id '

show ip verify source interface interface-id '

show ip verify source interface interface-id '

show ip verify source interface interface-id '

,

inactive-no-snooping-vlan '

inactive-trust-port '

active '

show ip verify source interface interface-id '

```



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Ruijie # **show ip verify source**

| Interface        | Filter-type | Filter-mode   |
|------------------|-------------|---------------|
| Ip-address       | Mac-address | VLAN          |
| -----            |             |               |
| FastEthernet 0/1 | ip          | active        |
| 00d0.f801.0101   | 1           | 192.168.4.243 |

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| 3                |   |
|------------------|---|
| ip verify source | т |

### 54.3.2 show ip source binding

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**show ip source binding** *ip-address mac-address*  
**dhcp-snooping static** *vlan vlan-id interface interface-id*

ð Ô

*ip-address* '  
*mac-address* '  
' ||  
'  
*vlan-id* '  
*interface-id* '

ð Ô

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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

$$\partial \quad \quad \quad \partial$$

|                   |  |
|-------------------|--|
| 3                 |  |
| ip source binding |  |

### 54.3.3 debug ip source bind

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```
debug ip source bind
```

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```
Ruijie# debug ip source bind
```

## 55 NFPP

### 55.1

配置

- › **cpu-protect sub-interface manage|protocol|route pps**
- › **cpu-protect sub-interface manage|protocol|route percent**

配置

- › **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

配置

命令

**cpu-protect sub-interface manage protocol route pps**  
*pps\_vaule*

配置

*pps\_vaule* ' ~ √

配置

~

命令

配置

配置

Ruijie(config)# **cpu-protect sub-interface manage pps**  
**200**

配置

|    |  |
|----|--|
| 配置 |  |
|----|--|

|                                                                |
|----------------------------------------------------------------|
| cpu-protect sub-interface manage  <br>protocol   route percent |
|----------------------------------------------------------------|

|       |
|-------|
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## 55.1.2 cpu-protect sub-interface {manage|protocol|route}

### percent

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

cpu-protect sub-interface manage protocol route percent  
percent\_vaule

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percent\_vaule ' ǎ ʍ ǎ

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Ruijie(config)# cpu-protect sub-interface manage  
percent 60

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| ǎ                                                           |  |
|-------------------------------------------------------------|--|
| cpu-protect sub-interface manage   pro<br>tocol   route pps |  |

## 55.1.3 arp-guard isolate timeout

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|---|---|

arp-guard isolate timeout seconds permanent

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seconds ' ǎ ʍ ǎ  
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**permanent** '

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```
Ruijie(config)# arp-guard isolate timeout 180
Ruijie(config)# interface g 0/1
Ruijie(config-if)# arp-guard isolate timeout permanent
```

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| 3                            |  |
|------------------------------|--|
| show arp-guard configuration |  |

## 55.1.4 arp-guard rate-limit

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**arp-guard rate-limit** *pps* **per-src-ip** **per-src-mac** **per-port**

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*pps* '  
*per-src-ip* '  
*per-src-mac* '  
*per-port* '

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```
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
```

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| 3                            |  |
|------------------------------|--|
| show arp-guard configuration |  |

## 55.1.5 arp-guard attack-threshold

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arp-guard attack-threshold *pps* per-src-ip per-src-mac per-port

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|-------------------------------------|--|
| <b>3</b>                            |  |
| <b>show arp-guard configuration</b> |  |
| <b>clear arp-guard users</b>        |  |
| <b>show arp-guard users</b>         |  |

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```
clear arp-guard users vlan vid interface interface-id ip-address
mac-address
```

```
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```

```
vid ' 1
```

```
interface-id ' 1
```

```
ip-address '
```

```
mac-address '
```

```
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```

```
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```

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```

```
Ruijie# clear arp-guard users vlan 1 interface g 0/1
```

```
Ø 3 Ô
```

| 3                          |  |
|----------------------------|--|
| arp-guard attack-threshold |  |
| show arp-guard users       |  |

## 55.1.8 clear arp-guard scan

```
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```

```
clear arp-guard scan
```

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```

```
Ruijie# clear arp-guard scan
```

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|--------------------------|--|
| arp-guard scan-threshold |  |
| show arp-guard scan      |  |

## 55.2

### 55.2.1 show arp-guard configuration

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show arp-guard configuration

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```
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
```

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| 3                          |  |
|----------------------------|--|
| arp-guard isolate timeout  |  |
| arp-guard rate-limit       |  |
| arp-guard attack-threshold |  |
| arp-guard scan-threshold   |  |



| 3                          |  |
|----------------------------|--|
| arp-guard attack-threshold |  |
| clear arp-guard users      |  |

### 55.2.3 show arp-guard scan

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**show arp-guard scan statistics**    **vlan** *vid*    **interface** *interface-id*  
*mac-address*

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*statistics* '

*vid* '                    1

*interface-id* '           1

*mac-address* '

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| 3                        |  |
|--------------------------|--|
| arp-guard scan-threshold |  |
| clear arp-guard scan     |  |

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

### 56.1.1 access-list

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*destination-mac-address any precedence precedence tos tos  
fragments time-range time-range-name*

### Internet Control Message Protocol

**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

**access-list** *id deny permit tcp VID out inner in source  
source-wildcard host Source any host source-mac-address any  
operator 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

**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*

**access-list** *list-remark text*

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id '            л Âл            ^            ~            ~            ~  
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Deny '            л ~            ~            Â

*Destination* ' ^ ŷ ~  
*destination-wildcard* ^ ↓ ∪ a ~  
**fragments** ' ↑  
**precedence** ' " |  
*precedence* ' " | ^ ~  
**time-range** ' ∅  
*time-range-name* ' ∅ ↓  
**tos** ' ⊥  
*tos* ' ⊥ ^ ~  
*icmp-type* ' ^ ~  
*icmp-code* ' { ^ ~  
*icmp-message* ' ↓  
*operator* ' ^ ~ ~ ~ a ~  
~  
**port** *port* ' ∪ ~ *range* ∪ ~ ∅ ~ ↓  
∪ ^  
**host** *source-mac-address* ' ŷ ^  
**host** *destination-mac-address* ' ŷ ^  
**VID** *vid* ' ∩  
*ethernet-type* ' ∪  
**match-all** ' ∩ *tcp flag* ∅  
*tcp-flag* '

∅      ∅

∅    {    ∅

∅      ∅

∅ ~ " |      { **access-list** ∅  
 ∪ ^ ∪ ∪      ∅      1

∪ ^



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

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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**

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↑

↳ **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**

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- » **aarp**
- » **appletalk**
- » **decnet-iv**
- » **diagnostic**
- » **etype-6000**
- » **etype-8042**
- » **lat**
- » **lavc-sca**
- » **mop-console**
- » **mop-dump**
- » **mumps**
- » **netbios**
- » **vines-echo**
- » **xns-idp**

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```
Ruijie(config)# access-list 1 permit 192.168.1.64
0.0.0.63
```

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```
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
```

```
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```

```
Ruijie(config)# access-list 702 deny host 00d0f8000c0c any aarp
```

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

```
Ruijie(config-if)# mac access-group 702 in
```

---





```
2 ^ show mac access-lists 2 ^
```

```

} A SHOW mac access-lists } A

```

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**show expert access-lists**

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| }                 |  |
| show access-lists |  |

## 56.1.6 ip access-list resequence

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**ip access-list resequence** *id name start-sn inc-sn*

**no ip access-list resequence** *id name*

Ø      Ô

*id'*      1

*name'*      1

*start-sn'*      1

*inc-sn'*      1

Ø      Ô

*start-sn'*

*inc-sn'*

Ø      { Ô

Ø      Ô

{ Â      **show access-lists**      {      Â

Ø      Ô

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#

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|                   |  |
|-------------------|--|
| 3                 |  |
| show access-lists |  |

## 56.1.7 deny

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**sn deny** *source source-wildcard host source any*

**sn deny protocol** *source source-wildcard destination destination-wildcard precedence precedence tos tos fragments time-range time-range-name*

8

### Internet Control Message Protocol

**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

**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

**sn** *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*

**sn deny any host** *source-mac-address any host destination-mac-address ethernet-type cos out inner in*

**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*

*∪*

*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*

*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*

,

#### **Internet Control Message Protocol**

*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**

*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 relay any*

*hostdestination-ipv6-address dscp dscp flow-label  
flow-label fragments time-range time-range-name*

### Internet Control Message Protocol

*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*

---

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```
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)#
```

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```
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)#
```

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```
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
```



[illegible]

```
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
```

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```
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
```

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|                            |                   |
|----------------------------|-------------------|
| <b>?</b>                   |                   |
| <b>show access-lists</b>   |                   |
| <b>ipv6 traffic-filter</b> | <b>?</b>          |
| <b>ip access-group</b>     |                   |
| <b>mac access-group</b>    |                   |
| <b>ip access-list</b>      | <b>?</b>          |
| <b>mac access-list</b>     | <b>?</b>          |
| <b>expert access-list</b>  | <b>?</b> <b>?</b> |
| <b>ipv6 access-list</b>    | <b>?</b>          |
| <b>permit</b>              | <b>?</b> <b>?</b> |

### 56.1.8 permit

$\hat{A}$                       **permit**                       $\bar{A}$                        $\bar{A}$   
 $\hat{A}$                        $\bar{A}$

*sn permit source source-wildcard host source any*

*sn permit protocol source source-wildcard destination*  
*destination-wildcard precedence precedence tos tos fragments*  
*time-range time-range-name*

8                      8

### Internet Control Message Protocol

*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

*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

*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*

*sn permit any host source-mac-address any host*  
*destination-mac-address ethernet-type cos out inner in*

*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*  
 $\bar{A}$

*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*

*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*

### **Internet Control Message Protocol**

*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**

*sn permit tcp VID ou 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**

*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*

*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

*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

*sn* **permit udp** [*port*]  
*source-ipv6-address* **any** *operator* **port** [*port*] **permit tcp** *source-ipv6-prefix* [*port*] [*prefix-length* | *host*] *destination-ipv6-address*

---

---

```

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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)#

```

```

Ю ~ ñ
 ÿ ñ Ё Â

Ruijie(config)# mac access-list extended 702
Ruijie(config-mac-nacl)# permit host 0013.0049.8272
any arp
Ruijie(config-mac-nacl)# show access-lists
mac access-list extended
10 permit host 0013.0049.8272 any arp702
Ruijie(config-mac-nacl)# exit
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# mac access-group 702 in

```

```

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 Â '

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

```

```

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 ~ Â '

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
```

ð      3 Ô

| 3                   |     |
|---------------------|-----|
| show access-lists   |     |
| ipv6 traffic-filter | 3   |
| ip access-group     |     |
| mac access-group    |     |
| ip access-list      | ℙ   |
| mac access-list     | ℙ   |
| expert access-list  | Ж ℙ |
| ipv6 access-list    | ℙ   |
| deny                | ℙ   |

### 56.1.9 list-remark

й      7      ~ no

**list-remark text**

ð      Ô

*text* '

ð      3      Ô

ð      Ô

й      7

ð      Ô

```
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
```

ð 3 Ô

| 3                 |    |
|-------------------|----|
| show access-lists |    |
| ip access-list    | 18 |

### 56.1.10 remark

71 ~

```
remark text
```

ð Ô

```
Text '
```

ð 3 Ô

ð Ô

Ï 71

ð Ô

```
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
```

ð 3 Ô

|   |  |
|---|--|
| 3 |  |
|---|--|

**show access-lists**



|        |   |   |
|--------|---|---|
| deny   | ✕ | ✕ |
| permit | ✕ | ✕ |

### 56.1.12 ip access-group

É ~  
 access-group Â 3 √ Â 3 ip

ip access-group *id name in out*  
 no ip access-group *id name in out*

ð Ô

*id* ' 11^ ~  
*name* ' 1  
*in* '  
*out* ' ÿ

ð Ô

ð 3 Ô

ð Ô

ip access-group 3 ~ Â

ð Ô

Ю Э  
 ,

Ruijie(config)# **interface fastEthernet 0/0**  
 Ruijie(config-if)#**ip access-group 120 in**

ð 3 Ô

| 3                   |           |
|---------------------|-----------|
| access-list         | ✕ Â       |
| show access-lists   |           |
| show ip access-list | ~ ↑ ~ ^ ~ |

### 56.1.13 MAC access-group

Â 3 no ✓

Â

**mac access-group** *id name in out*  
**no mac access-group** *id name in out*

ð Ô

*id* ' ^ ~  
*name* ' ↓  
**in** '  
**out** ' ÿ

ð Ô

ð 3 Ô

ð Ô

Â **show running-config** 3

Â

ð Ô

Ю

Э'

Ruijie(config)# **interface GigaEthernet 1/1**  
Ruijie(config-if)# **mac access-group**  
**accept\_00d0f8xxxxxx\_only in**

ð 3 Ô

| 3                        |     |
|--------------------------|-----|
| <b>show access-group</b> | Э Â |

## 56.1.14 expert access-group

Â 3 no

✓ Â

**expert access-group** *id name in out*  
**no expert access-group** *id name in out*

ð Ô

*id* ' ^ ~

3

*name* ' 1  
*in* '  
*out* ' y

ð Ô

ð 3 Ô

ð Ô

show access-group 3 8 Â

ð Ô

Ю

3'

Ruijie(config)# **interface GigaEthernet 0/1**  
**Ruijie(config-if)# expert access-group**  
accept\_00d0f8xxxxxx\_only in

ð 3 Ô

| 3                 |     |
|-------------------|-----|
| show access-group | 3 Â |

## 56.1.15 ipv6 traffic-filter

Â 3 1

Â

**ipv6 traffic-filter** *name* in out  
**no ipv6 traffic-filter** *name* in out

ð Ô

*name* ' 1  
*in* '  
*out* ' y

ð Ô

ð 3 Ô

---

```

Ruijie# show ipv6 traffic-filter

```

```

Ruijie#
Ruijie(config)# interface GigaEthernet 0/1
Ruijie(config-if)# ipv6 traffic-filter v6-acl in

```

```
Ruijie# show access-group
```

| show access-group |  |
|-------------------|--|

## 56.2

6. Ruijie# show access-lists
- 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

```

Ruijie# show access-lists

```

| id | name |
|----|------|
|    |      |

```

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
```

ð 3 Ô

### 56.2.3 show expert access-group

Â

**show expert access-group interface** *interface*

ð Ô

*interface* '

ð 3 Ô

ð Ô

ð Ô

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

ð 3 Ô

| 3                                  |     |
|------------------------------------|-----|
| <a href="#">expert access-list</a> | 177 |

### 56.2.4 show mac access-group

**show mac access-group interface** *interface*

ð Ô

*interface* '

ð 3 Ô

ð Ô

ð Ô

```
Ruijie# show mac access-group interface gigabitethernet
0/3
mac access-group mm in
Applied On interface GigabitEthernet 0/3.
```

ð 3 Ô

| 3               |     |
|-----------------|-----|
| mac access-list | 178 |

## 56.2.5 show ipv6 traffic-filter

```
show ipv6 traffic-filter interface interface
```

ð Ô

interface '

ð 3 Ô

ð Ô

ð Ô

```
Ruijie# show ipv6 traffic-filter interface
gigabitethernet 0/4
ipv6 traffic-filter v6 in
Applied On interface GigabitEthernet 0/4.
```

ð 3 Ô

| 3                |     |
|------------------|-----|
| ipv6 access-list | 178 |

3

8 3 0

8 0

3 ~ a 3

8 0

```
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.
```

8 3 0

| 3                   |    |
|---------------------|----|
| ip access-group     | 18 |
| mac access-group    | 18 |
| expert access-group | 18 |
| ipv6 traffic-filter | 18 |

## 56.3

6 100 3

3

, security global access-group

3

, security access-group

, security uplink enable

### 56.3.1 security global access-group

security global access-group *id name*

no security global access-group



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$$id$$

```
name |
```

Ô 3 Ô

Ồ                      Ô

Ồ Ô

```
Ruijie(config)#security global access-group 1
```

$$\mathcal{O} \quad \mathfrak{z} \hat{\mathcal{O}}$$

|               |  |
|---------------|--|
| 3             |  |
| show secu-acl |  |

### 56.3.2 security access-group

**security access-group** *id name*

**no security access-group**

Ồ                      Ô

$$id$$

name |

$$\hat{O} \quad \hat{Z} \quad \hat{O}$$

Ồ                      Ô

Ю

Ồ Ô

```
Ruijie(config-if)#security access-group 1
```

$$\partial \quad \quad \quad \partial$$

|               |  |
|---------------|--|
| 3             |  |
| show secu-acl |  |

### 56.3.3 security uplink enable

security uplink enable

no security uplink enable

0 3 0



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

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

## 57.2

### 57.2.1 mls qos trust

```

mls qos trust cos dscp ip-precedence
no mls qos trust

Ruijie(config)# mls qos trust
Ruijie(config)# cos ' '
Ruijie(config)# dscp ' '
Ruijie(config)# ip-precedence ' '
Ruijie(config)# no ' '

Ruijie(config)# a

Ruijie(config)#

Ruijie(config)#

Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# mls qos trust cos

Ruijie(config)#

Ruijie(config)# show mls qos interface interface-id

```

### 57.2.2 mls qos cos

```
mls qos cos default-cos
```

no mls qos cos

}

---

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ø Ô

↓

```
Ruijie(config)# mac access-list extended me
```

```
Ruijie(config-ext-macl)# permit host 1111.2222.3333
any
```

```
Ruijie(config-ext-macl)# exit
```

↓

```
Ruijie(config)# class-map cm
```

```
Ruijie(config-cmap)# match access-group me
```

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

ø { Ô

```
show mac access-lists
```

```
show ip access-lists
```

```
show class-map
```

## 57.2.4 Policy Maps

~

```
no policy-map policy-map-name
```

↑

↑

```
no class class-map-name
```

**police** *rate-bps burst-byte exceed-action drop dscp dscp-value*  
**no police**

Ồ                      Ô

```

policy-map-name '
no policy-map policy-map-name '
class-map-name '
no class class-map-name '
new-dscp '
rate-bps '
burst-byte '
drop '
dscp-value '
a ↓

```

$$\tilde{O} \quad \{ \quad \hat{O}$$

Ồ Ô

```

Ruijie(config)# policy-map po

Ruijie(config-pmap)# class cm

Ruijie(config-pmap-c)# set ip dscp 10

Ruijie(config-pmap-c)# police 1000000 4096
exceed-action dscp 16

```

$$\partial \quad \quad \quad \partial$$

**show policy-map**

### 57.2.5 service-policy

Э

**service-policy** *input* *output* *policy-map-name*

**no service-policy input output**

ð Ô

*policy-map-name* ' 1

**no** ' 3

ð 3 Ô

ð Ô

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**

ð 3 Ô

**show mls qos interface**

ð 1 Ô

Ю а

## 57.2.6 priority-queue

**no priority-queue**

ð Ô

**priority-queue** й

**no priority-queue** й

ð Ô

й

ð 3 Ô

ð Ô

Ruijie(config)# **no priority-queue**

ð 3 Ô

**show mls qos queueing**

---



## 57.2.7 priority-queue cos-map

```
priority-queue cos-map qid cos0 cos1 cos2 cos3 cos4 cos5 cos6
cos7
```

```
no priority-queue cos-map
```

```
Ø Ô
```

```
qid ' ù '
cos0 ... cos7 ' '
no ' Â
```

```
Ø Ô
```

```
Ø 3 Ô
```

```
Ø Ô
```

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

```
Ø 3 Ô
```

```
show mls qos queueing
```

## 57.2.8 wrr-queue bandwidth

```
wrr-queue bandwidth weight1 ... weightn
```

```
no wrr-queue bandwidth
```

```
Ø Ô
```

```
weight1...weightn ù ~ √
```

```
no ' Â
```

```
Ø Ô
```

```
Ø 3 Ô
```

Ø    Ô

```
Ruijie(config)# wrr-queue bandwidth 1 2 3 4 5 6 7 8
```

Ø    ¶ Ô

```
show mls qos queueing
```

## 57.2.9 mls qos map cos-dscp

```
mls qos map cos-dscp dscp1...dscp8
```

```
no mls qos map cos-dscp
```

Ø    Ô

```
dscp ' ¶ a ¶ a ¶
```

```
no '
```

Ø    Ô

Ø    ¶ Ô

Ø    Ô

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

Ø    ¶ Ô

```
show mls qos maps
```

## 57.2.10 mls qos map dscp-cos

```
mls qos map dscp-cos dscp-list cos
```

```
no mls qos map dscp-cos
```

Ø    Ô

```
dscp-list ' ¶ a ¶ a ¶
```

```
cos ' ¶ .
```

```
no '
```

---

}

Ø      Ô

Ø    {    Ô

Ø      Ô

```
Ruijie(config)# mls qos map dscp-cos 8 10 16 18 to 0
```

Ø      { Ô

```
show mls qos maps
```

## 57.2.11 interface rate-limit

8

```
rate-limit input output bps burst-size
```

```
no rate-limit
```

Ø      Ô

```
input ' ñ
```

```
output ' ñ
```

```
bps ' 8
```

```
burst-size ' 8 √ a √ a √
```

```
no ' √
```

Ø    {    Ô

Ø      Ô

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

```
Ruijie(config-if)# rate-limit input 1000000 4096
```

Ø      { Ô

```
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 Tf0.1902 Tc 00.6 0 Tdsp
```

---

```
no mls qos scheduler
```

```
Ø Ô
```

```
sp ' '|
```

```
rr '
```

```
wrr'
```

```
drr'
```

```
no'
```

```
Ø Ô
```

```
 ñ
```

```
Ø 3 Ô
```

```
Ø Ô
```

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

```
Ø 3 Ô
```

```
show mls qos scheduler
```

### 57.2.13 drr-queue bandwidth

```
drr-queue bandwidth weight1...weight8
```

```
no drr-queue bandwidth
```

```
Ø Ô
```

```
weight1...weight8 ' ↓
```

```
no '
```

```
Ø Ô
```

```
Ø 3 Ô
```

```
Ø Ô
```

```
Ruijie(config)# drr-queue bandwidth 1 2 3 4 5 6 7 8
```

```
Ø 3 Ô
```

---

```
show mls qos queueing
```

### 57.2.14 mls qos map ip-prec-dscp

```
mls qos map ip-prec-dscp dscp1...dscp8
```

```
no mls qos map ip-prec-dscp
```

Ồ                      Ô

**dscp** '     √                    a √     a √

no

Ồ                      Ô

Ô 3 Ô

Ồ Ô

```
Ruijie(config)# mls qos map ip-prec -dscp 8 10 16 18 24
26 32 34
```

$$\mathcal{O} \quad \mathfrak{z} \quad \hat{\mathcal{O}}$$

**show mls qos maps**

## virtual-group

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3

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**virtual-group** *virtual-group-number*

**no virtual-group** *virtual-group-number*

ỒỒ

|                             |                  |
|-----------------------------|------------------|
|                             |                  |
| <i>virtual-group-number</i> | $\Lambda^{\sim}$ |

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a

$$\tilde{O} \quad \mathfrak{z} \quad \hat{O}$$

Ồ                      Ô

Ố      Ô

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

$$\partial \quad \partial \hat{O}$$

|                    |  |
|--------------------|--|
| 3                  |  |
| show virtual-group |  |

## 57.3

### 57.3.1 show class-map

**show class-map** *class-name*

Ồ Ô

```
class-name ' ↵
```

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$$\tilde{O} \quad \mathfrak{Z} \quad \hat{O}$$

Ồ      Ô

```
Ruijie# show class-map
```

### 57.3.2 show policy-map

**show policy-map** *policy-name* **class** *class-name*

```

 0 0
 policy-name '
 class-name '

```

```

0 0

```

```

0 3 0

```

```

0 0

```

```
Ruijie# show policy-map
```

### 57.3.3 show mls qos interface

```
show mls qos interface interface-id policers
```

```

0 0
 interface-id '
 policers '

```

```

0 0

```

```

0 3 0

```

```

0 0

```

```
Ruijie# show mls qos interface fastEthernet 0/1
```

### 57.3.4 show mls qos virtual-group

```
show mls qos virtual-group virtual-group-number policers
```

```

0 0
 virtual-group-number '
 policers '

```

```

0 0

```

---

ð ƒ Ô

ð Ô

```
Ruijie# show mls qos virtual-group 1
```

```
Ruijie# show mls qos virtual-group policers
```

### 57.3.5 show mls qos queueing

```
show mls qos queueing
```

ð ƒ Ô

ð Ô

```
Ruijie# show mls qos queueing
```

### 57.3.6 show mls qos scheduler

```
"|
```

```
show mls qos scheduler
```

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

### 57.3.7 show mls qos maps

```
show mls qos maps cos-dscp dscp-cos ip-prec-dscp
```

ð Ô

```
cos-dscp '
```

```
dscp-cos '
```

```
ip-prec-dscp '
```

---



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```
Ruijie# show mls qos maps
```

### 57.3.8 show mls qos rate-limit

8

**show mls qos rate-limit interface** *interface-id*

Ồ Ô

```
interface ' {
```

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

### 57.3.9 show virtual-group

**show virtual-group** *virtual-group-number* | **summary**

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**virtual-group-number'**  $\Lambda^{\sim}$

## summary

0 3 0

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```
Ruijie# show virtual-group 1
```

```
Ruijie# show virtual-group summary
```

58

WRED

58.1 WRED

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**wrr-queue random-detect min-threshold** *queue\_id* *thr1* [*thr2* *thr3*]

**no wrr-queue random-detect min-threshold** *queue\_id*

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|                 |              |
|-----------------|--------------|
|                 |              |
| <i>queue_id</i> | $\Lambda'$   |
| <i>prob1</i>    |              |
| <i>prob2</i>    | $\gamma$     |
| <i>prob3</i>    | $\mathbf{b}$ |

$$\begin{array}{ccccccc} & & \text{IO} \downarrow & & \hat{A} & & \\ & & \downarrow \hat{A} & & \downarrow & & \\ \sim & & \neq \downarrow & & \varepsilon & & \hat{A} \\ & & & & \hat{A} & & \\ & & \downarrow & & \hat{A} & & \end{array}$$

```
Ruijie(config-if)#wrr-queue random-detect probability 1 61 62 63
```

|   |  |
|---|--|
| 3 |  |
|   |  |
|   |  |

```
wrr-queue cos-map threshold_id cos1 cos2 cos3 cos4 cos5 cos6 cos7
cos8
```

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

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|-----------|-----------|
| queue_id  | Л         |
| cos_value | ^ ~ ~ ~ , |

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Ruijie(config-if)#wrr-queue cos-map 2 1 6

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-----  
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'&a t`1+a t"#t\$tf{a t&c tft t` (t|)0P,0\$!5B\*UD

## 59 VRRP

### 59.1

{ '}

- , 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

{

---



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---

vrrp 1 authentication x30dn78k

δ 3 Ô



**vrrp**



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**vrrp group ip ipaddress secondary**

**no vrrp group ip ipaddress secondary**

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group ' /'

ipaddress ' '

secondary ' Â

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*group* ' ʌ

**delay** *seconds* ' ʌ

---





|                                |
|--------------------------------|
| <b>vrrp group timers</b>       |
| <b>advertise msec interval</b> |

### 59.1.9 vrrp track

```

vrrp group track interface-type number
vrrp group track ip-address
vrrp group track bfd
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

```

ð Ô

```

group '
interface-type '
number '
ipv4-address '
interval-value '
timeout-value '
priority '

```

ð Ô

```

Ю Э

```

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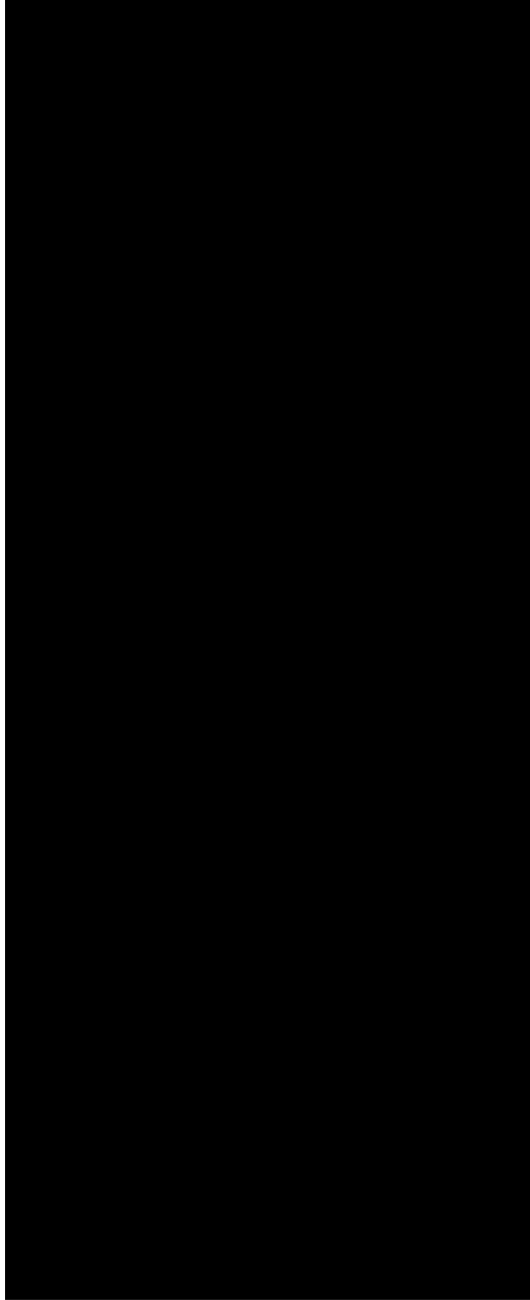
ð Ô

```

↓ ↓
↓

```

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```

VRRP: Grp 1 Advertisement from 192.168.201.213 has
invalid virtual address 192.168.1.1

```

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**no debug vrrp events**

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```
VRRP: Grp 1 Event - Advert higher or equal priority
```

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**no debug vrrp packets**

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---

```

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

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

```

### 59.2.5 debug vrrp state

```

Ruijie# debug vrrp state
Ruijie# no debug vrrp state

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

3

Â

```
show vrrp brief grou
```

ð

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```
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#

```

```
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#

```

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| ρ                                                  |   |
|----------------------------------------------------|---|
| <b>vrrp group ip</b><br><i>ipaddress secondary</i> | π |

### 59.3.2 show vrrp interface

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```
show vrrp interface type number brief
```

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```

type '
number ' /1
brief ' ↓ Â

```

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8 0

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```
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
```

8 3 0

| 3                                                   |   |
|-----------------------------------------------------|---|
| <b>vrrp group ip</b><br><i>ip address secondary</i> | П |



```
Ruijie(config-if)# bfd interval 100 min_rx 100 multiplier 3
```

ð 3 Ô

| 3                         |        |
|---------------------------|--------|
| <b>bfd all-interfaces</b> | 6    Â |
| <b>clear bfd</b>          | Â      |
| <b>ip ospf bfd</b>        | 6    Â |
| <b>ip rip bfd</b>         | 6      |

ð 1 Ô

## 60.1.2 bfd all-interfaces

```
6 || 10 bfd all-interfaces 3
no 3 11 Â
```

**bfd all-interfaces**

**no bfd all-interfaces**

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

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a 6 BFD ||

ð 3 Ô

ð Ô

```
4 11 6 ||
' 10 no bfd all-interfaces 3
6 ||
Y ' 11
3 ip ospf bfd disable ip rip bfd disable
6 ||
```



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Ruijie(config)# **bfd cpp**

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|---|--|
| { |  |
| - |  |

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## 60.1.4 bfd echo

Ю     **bfd echo**     {                     ~     **no**     {

^

**bfd echo**

**no bfd echo**

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

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Ю     No

```
Ruijie(config)# no switchport
```

```
Ruijie(config-if)# bfd echo
```

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| 3                     |     |
|-----------------------|-----|
| <b>bfd</b>            | Â   |
| <b>ip redirects</b>   | π Â |
| <b>ip deny land</b>   | π Â |
| <b>bfd slow-timer</b> |     |

ð 4 Ô

## 60.1.5 bfd slow-timer

Ю **bfd slow-timer** 3

8 Â **no** 3

Â

**bfd slow-timer** *milliseconds*

**no bfd slow-timer**

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| <i>milliseconds</i> | (↓) BFD<br>ÿ 1000 30000, Æ ÿ Â ↓<br>ÿ 1000 Â |
|---------------------|----------------------------------------------|

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ÿ 1000ms

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ÿ Â

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

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|          |   |
|----------|---|
| 3        |   |
| bfd echo | π |

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## 60.1.6 bfd up-dampening

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---

3

---

4

3 4

| 1       |   |
|---------|---|
| 10.3(5) | 3 |

60.1.7 ip ospf bfd

---

| <b>bfd</b>                | Â |
|---------------------------|---|
| <b>bfd all-interfaces</b> | 6 |

ð ¼ Ô

disable Ю ip rip bfd ð 6 ||  
no ð Â

ip rip bfd disable

no ip rip bfd

ð Ô

| <b>disable</b> | ( ↓ ) Э RIP 6 BFD    Â |
|----------------|------------------------|

ð Ô

disable ð 6 BFD ||

ð ð Ô

ð Ô

ч ↓ √ Ю 6 ||  
' no bfd all-interfaces ð  
6 ||  
γ ' ↓ √ ip rip bfd [disable] ð  
6 ||

ð Ô

Э 6 || Â

Ruijie(config)# **interface** FastEthernet 0/2

Ruijie(config-if)# **no switchport**

Ruijie(config-if)# **ip rip bfd disable**

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---

|                           |          |           |            |
|---------------------------|----------|-----------|------------|
| <b>bfd</b>                | <b>Â</b> |           |            |
| <b>bfd all-interfaces</b> | <b>6</b> | <b>  </b> | <b>BFD</b> |

---

```
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
```

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|     |   |
|-----|---|
| 3   |   |
| bfd | Â |

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## 60.1.10 neighbor fall-over bfd

6 || √ 70 neighbor fall-over 3  
no 3 71



```
Ruijie(config-router)# neighbor 172.16.0.2 fall-over bfd
```

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

3 0

| 3   |   |
|-----|---|
| bfd | Â |

0 1 0

### 60.1.11 set ip next-hop verify-availability

```
set ip next-hop verify-availability 3
no
```

3 11 Â

```
set ip next-hop verify-availability next-hop-address track 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
```

0 0

| <b>vrf</b> <i>vrf-name</i> | ( ↓ ) VRF ↓    |
|----------------------------|----------------|
| <i>next-hop-address</i>    | ( ↓ ) IP       |
| <b>track</b>               | ( ↓ ) Track 10 |
| <i>number</i>              | ( ↓ ) track 1  |
| <b>bf 0</b>                | )tm 1 P M      |

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#

BFD

~

BFD

6 172.16.0.2

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**

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|   |      |    |     |   |   |   |
|---|------|----|-----|---|---|---|
|   | "1   | IP | BFD |   |   |   |
| ~ | VRRP |    | ,   | } | ↓ | Ï |
|   |      | IP |     |   |   |   |

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Ruijie#**configure terminal**

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

|                               |                               |
|-------------------------------|-------------------------------|
|                               |                               |
| <b>vrf</b> <i>vrf-name</i>    | ↓                      ↓    Â |
| <b>client</b>                 | ↓                             |
| <b>bgp</b>                    |                               |
| <b>ospf</b>                   |                               |
| <b>rip</b>                    |                               |
| <b>vrrp</b>                   |                               |
| <b>static-route</b>           |                               |
| <b>pbr</b>                    |                               |
| <b>ipv4</b> <i>ip-address</i> | ↓                             |
| <b>ipv6</b> <i>ip-address</i> | ↓                             |
| <b>details</b>                |                               |

```
show bfd neighbors 3 10'
```

```
Ruijie# show bfd neighbors
```

|             |             |       |    |             |
|-------------|-------------|-------|----|-------------|
| OurAddr     | NeighAddr   | LD/RD | RH | Holdown(mul |
| Int         |             |       |    |             |
| 172.16.11.1 | 172.16.11.2 | 1/2   | 1  | 532 (3 )    |
| Ge2/1       |             |       |    |             |

```
show bfd neighbors details 3 10'
```

```
Ruijie# show bfd neighbors details
```

| OurAddr     | NeighAddr   | LD/RD | RH | Holdown(mul |
|-------------|-------------|-------|----|-------------|
| Int         |             |       |    |             |
| 172.16.11.1 | 172.16.11.2 | 1/2   | 1  | 532 (3 )    |
| 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)

```

Tx Count: 84488, Tx Interval (ms) min/max/avg: 152/248/196

Uptime: 02:18:49

```
I Hear You bit: 1 - Demand bit: 0
```

Multiplier: 3                      - Length: 24

Min tx interval: 50000 - Min rx interval: 50000

[illegible]

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|  | 1  |

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| - |  |

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| rerp region |  |

### 61.1.2 rerp hello-interval

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**rerp hello-interval** *interval*

**no rerp hello-interval**

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*interval* ' ˘ ˘ ʏ

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Ruijie(config)# **rerp hello-interval** 2

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|---------------------|--|
| rerp fail- interval |  |

### 61.1.3 rerp fail-interval

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**rerp fail- interval** *num*

**no rerp fail- interval**

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*num* ' ˘ ʏ



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```
Ruijie(config)# rerp fail-interval 6
```

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|                      |  |
|----------------------|--|
| 3                    |  |
| rerp hello- interval |  |

#### 61.1.4 rerp region

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 $\hat{A}$ **rerp region** *num*

**no rerp region *num***

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*num* ' ,

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Ruijie# rerp region 1

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|   |  |
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| 3 |  |
|---|--|

}

---

|             |   |
|-------------|---|
| rerp enable | } |
|-------------|---|

**61.1.5 ring**

**edge-ring** *num* **role** **primary-edge|secondary-edge** **ctrl-vlan** *vid*  
**shared-port interface** *interface-id* **sub-port interface** *interface-id*  
**no ring** *num*

ð Ô

**num**

**primary-edge|secondary-edge** ÿ ÿ

**vid** 8

**interface-id**

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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*

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

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clear rerp statistics

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ð 3 Ô

### 61.2.4 debug rerp

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debug rerp packet event

undebut rerp packet event

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packet Â

event Y<sup>+</sup> Â

ð 3 Ô

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3 0

| 3                                   |       |
|-------------------------------------|-------|
| show interface switchport<br>backup | 3 4 Â |

## 62.1.2 switchport backup interface *interface-id* preemption

3 4 Â

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/TT3 1 T*



preemption delay 40

0 3 0

| 3                                |       |
|----------------------------------|-------|
| show interface switchport backup | À 3 4 |

### 62.1.3 mac-address-table move update receive

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mac-address-table move update receive

no mac-address-table move update receive

0 0

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0 3 0

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0 0

4 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 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000

0 0

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Ruijie(config)# mac-address-table move update receive

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|---------------------------------------|---|
| mac-address-table move update transit | À |

### 62.1.4 mac-address-table move update transit

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mac-address-table move update transit





0 0

*interface-id :*

**detail :**

0 0

0 3 0

0 0

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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

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 3 '

```

#### 63.1.1 rldp loop-detect enable

```

3 8 11 Â

```

rldp loop-detect enable

no rldp loop-detect enable

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| Ruijie(config)# rldp loop-detect enable |   |

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| 3         | 3 |    |
| rldp port |   | 11 |

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### 63.1.2 rldp detect-interval

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**rldp detect-interval** *interval*

**no rldp detect-interval**

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*interval*

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```
Ruijie(config)# rldp detect-interval 5
```

37n5T46( )Tj363.12 0

162.12

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**rldp detect-max** *num*

no rldp detect-max

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|------------|---|---|
|            |   |   |
| <i>num</i> | ✓ | ✗ |


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| 3   | 3         |   |
|     | rldp port | π |
| √   |           |   |
| 3 √ | π         |   |
|     |           |   |

63.1.6 rldp port

|                                                                                                                 |                                                                                    |   |
|-----------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|---|
| 3                                                                                                               | ~ √                                                                                | Â |
| 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(( ))TΛC2_0 1 Tf0 Tc 15.467 0.006 Td[2983243C<1E94231F>6<324F0D5F>]TΔT |   |





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## 64 DLDP

### 64.1

DLDP 3'

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#### 64.1.1 dldp

DLDP 3' 3'

**dldp** *ip-address* **next-hop** *ipv4-address* **interval** *tick* **retry** *retry-num*  
**resume** *resume-num*  
**no dldp** *ip-address*



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```
Ruijie(config-if-VLAN 1)#lldp passive
```

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 $\hat{A}$                            - 26(dldp \_0 1 Tf0 Tc 3.162 0 02 0 0 1.5 169.86 448.340324

Â [\\_\\_\\_\\_\\_](#) - 26(dldp\_0 1 Tf0 Tc 3.162 0 02 0 0 1.5 169.86 448.3403248 869A345C4>A51





✓

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

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## 64.3

### 64.3.1 clear dldp

**clear dldp interface** *interface-name* *ip-address*

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|  |  |
|  |  |

|  |
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|  |
|--|

---

*ip-address*

---

3

[illegible]

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|-----|----|--|
| 3 4 | 11 |  |
|     |    |  |

## **65            TPP**

### **65.1**

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Ruijie(config-if)# **tp-guard port enable**

Ruijie(config-if)# **no tp-guard port enable**

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**topology guard '**

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## 65.2 TPP

### 65.2.1 show tpp

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**show tpp**

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Ruijie# **show tpp**

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**topology guard '**

π

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# 66

## 66.1

```

 {
 cd
 cp
 ls
 makefs
 mkdir
 mv
 pwd
 rm
 rmdir
 }
```

### 66.1.1 cd

```

 {
 cd DIRECTORY
 }
```

---

| 3  |  |
|----|--|
| ls |  |

## 66.1.2 cp

~ ~ ~ ^

**cp dest DESTINE\_FILE DIRECTORY sour SOURCE\_FILE**

**cp sour SOURCE\_FILE dest DESTINE\_FILE DIRECTORY**

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DESTINE\_FILE ~

DIRECTORY 8 ~

SOURCE\_FILE 8 ~ ↓

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~ ~ ~ ~ ~

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~

~ **cp 3 a** 8 ^

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Ruijie# **cp sour log.txt dest ../log\_bak.txt**

## 66.1.3 ls

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**ls PATHNAME**

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*PATHNAME* ↵ ~ ~ ÿ Ю

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Ruijie# **ls**

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Ruijie# **ls tmp**

## 66.1.4 makefs

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**makefs dev** *DEVNAME* **fs** *FSNAME*

**makefs fs** *FSNAME* **dev** *DEVNAME*

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*DEVNAME* ↵

*FSNAME* Ǝ ~ ↵

***FSNAME*** E ° Ô

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Ruijie# **makefs dev /dev/mtdblock/1 fs jffs2**

## 66.1.5 mkdir

**mkdir** *DIRECTORY*

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*DIRECTORY'* ↓

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Ruijie# **mkdir test**

## 66.1.6 mv

|| ' 1 ' ~

**mv sour** *SOURCE\_FILE* **dest** *DESTINE\_FILE* *DIRECTORY*

**mv dest** *DESTINE\_FILE* *DIRECTORY* **sour** *SOURCE\_FILE*

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*SOURCE\_FILE* || ' ~

*DESTINE\_FILE/DIRECTORY'* ~

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1 1

```
Ruijie# mv sour tmp/log.txt dest ../config.txt
```

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```
mv sod (des
```

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**rm** *FILE*

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FILE

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0 3 0

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```
Ruijie# rm log.txt
```

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|--------------|------------------------------------------------------------------------------------------------|
| $\{$         |                                                                                                |
| <b>rmdir</b> | $\begin{array}{c} \text{й} \quad \{ \\ \text{л} \quad \{ \neq \downarrow \text{л} \end{array}$ |

### 66.1.9 rmdir

 $\hat{A}$ **rmdir** *directory*

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*directory* 'ɹɪktərɪ'      ɹ      ɪ

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Ruijie# **rmdir** tmp

Ruijie# **ls**

```
4 0% 0% 0% printk_task
```

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|    |    |    |    |                         |
|----|----|----|----|-------------------------|
| 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% | d1x_task                |
| 20 | 0% | 0% | 0% | secu_policy_task        |
| 21 | 0% | 0% | 0% | dhcpc_task              |
| 22 | 0% | 0% | 0% | dhcpsnp_task            |
| 23 | 0% | 0% | 0% | igmp_snp                |
| 24 | 0% | 0% | 0% | mstp_event              |
| 25 | 0% | 0% | 0% | GVRP_EVENT              |
| 26 | 0% | 0% | 0% | rldp_task               |
| 27 | 0% | 2% | 1% | rerp_task               |
| 28 | 0% | 0% | 0% | reup_event_handler      |
| 29 | 0% | 0% | 0% | tpp_task                |
| 30 | 0% | 0% | 0% | ip6timer                |
| 31 | 0% | 0% | 0% | rtadvd                  |
| 32 | 0% | 0% | 0% | tnet6                   |
| 33 | 2% | 0% | 0% | tnet                    |
| 34 | 0% | 0% | 0% | Tarptime                |
| 35 | 0% | 0% | 0% | gra_arp                 |
| 36 | 0% | 0% | 0% | Ttcptimer               |
| 37 | 8% | 1% | 0% | ef_res                  |
| 38 | 0% | 0% | 0% | ef_rcv_msg              |
| 39 | 0% | 0% | 0% | ef_inconsistent_daemon  |
| 40 | 0% | 0% | 0% | ip6_tunnel_rcv_pkt      |
| 41 | 0% | 0% | 0% | res6t                   |
| 42 | 0% | 0% | 0% | tunrt6                  |
| 43 | 0% | 0% | 0% | ef6_rcv_msg             |
| 44 | 0% | 0% | 0% | ef6_inconsistent_daemon |
| 45 | 0% | 0% | 0% | imid                    |
| 46 | 0% | 0% | 0% | nsmd                    |
| 47 | 0% | 0% | 0% | ripd                    |
| 48 | 0% | 0% | 0% | ripngd                  |
| 49 | 0% | 0% | 0% | ospfd                   |
| 50 | 0% | 0% | 0% | ospf6d                  |

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|    |    |    |    |                        |
|----|----|----|----|------------------------|
| 51 | 0% | 0% | 0% | bgpd                   |
| 52 | 0% | 0% | 0% | pimd                   |
| 53 | 0% | 0% | 0% | pim6d                  |
| 54 | 0% | 0% | 0% | pdmd                   |
| 55 | 0% | 0% | 0% | dvmrpd                 |
| 56 | 0% | 0% | 0% | vty_connect            |
| 57 | 0% | 0% | 0% | aaa_task               |
| 58 | 0% | 0% | 0% | Tlogtrap               |
| 59 | 0% | 0% | 0% | dhcp6c                 |
| 60 | 0% | 0% | 0% | sntp_recv_task         |
| 61 | 0% | 0% | 0% | ntp_task               |
| 62 | 0% | 0% | 0% | sla_daemon             |
| 63 | 0% | 3% | 1% | track_daemon           |
| 64 | 0% | 0% | 0% | pbr_guard              |
| 65 | 0% | 0% | 0% | vrrpd                  |
| 66 | 0% | 0% | 0% | psnpd                  |
| 67 | 0% | 0% | 0% | igsnpd                 |
| 68 | 0% | 0% | 0% | coa_recv               |
| 69 | 0% | 0% | 0% | co_oper                |
| 70 | 0% | 0% | 0% | co_mac                 |
| 71 | 0% | 0% | 0% | radius_task            |
| 72 | 0% | 0% | 0% | tac+_acct_task         |
| 73 | 0% | 0% | 0% | tac+_task              |
| 74 | 0% | 0% | 0% | dhcpcd_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           |

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```

cpu-log log-limit low_num high_num
log-limit
low_num
high_num

```

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```

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 J й æ æ Â Ю ~ J
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 Ю æ й ~
 й Â
ruijie(config)# cpu-log log-limit 70 80
 Ю '
Oct 20 15:47:01 %SYSCHECK-5-CPU_USING_RATE: CPU
utilization in one minute : 95%~ Using most cpu's task
is ktimer : 94%
 æ Ю '
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

```

 П Б 3'
show memory
memory-lack exit-policy
show memory protocols

```

### 67.2.1 show memory

```

 ~
 3 show
memory Â
show memory
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```

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policy bgp ospf pim-sm rip

exit-policy

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## show memory protocols

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Ruijie(config)# **show memory protocols**

| =====    |              |
|----------|--------------|
| protocol | memory(byte) |
| BGP      | 102000000    |
| OSPF     | 24000000     |
| RIP      | 10000000     |
| PIM      | 50000000     |
| LDP      | 20000000     |
| Total    | 206000000    |

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| õ | 4 | Ô |             |  |
|   |   |   | 3           |  |
|   |   |   | show memory |  |

## 67.3

### 67.3.1

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67.3.1.1 threshold set

no

threshold set {cpu | memory | temperature} [M1 | M2 | slot *n* | member *n*]  
*warning\_value* *critical\_value*

no threshold set {cpu | memory | temperature}

ø Ô

|                            |                              |
|----------------------------|------------------------------|
|                            |                              |
| cpu   memory   temperature | cpu<br>memory<br>temperature |
| M1   M2   slot <i>n</i>    | <i>n</i>                     |
| member <i>n</i>            | <i>n</i>                     |

*warning\_value*      cpu    memory  
                         temperature  
                         +ÄÄ@8× Áfqñ



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Ruijie# show threshold memory

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The diagram illustrates the logging process for a configuration change. It shows a sequence of events: "logging on", "no logging on", and "Ruijie(config)# no logging on". The diagram uses various symbols (like 'a', 'J', 'E', 'A', 'O', 'd', 'z') to represent different states or actions. A table at the bottom shows the state of the logging process after the configuration change.

| z                |     |
|------------------|-----|
| logging buffered | ǎ ʘ |
| logging          |     |

|                 |   |
|-----------------|---|
| logging monitor | Э |
| logging trap    |   |

## 68.1.2 terminal monitor

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terminal monitor
terminal no monitor
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 &
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Ruijie# terminal monitor
Ruijie#

```

## 68.1.3 logging buffered

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**show logging** ^

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| 3          |  |
| logging on |  |

$\begin{array}{ccccccc} & \tilde{\nu} & & 8\tilde{\nu} & & \tilde{\nu} & \sim \\ \grave{\text{E}} & & \tilde{\nu} & & \sim & , & \\ & \sim & & & & \tilde{\nu} & \\ \tilde{\Upsilon} & \downarrow & & \downarrow & & \Lambda^{\sim} & \dot{\eta}' \\ & , & & & & \tilde{\nu} & \downarrow & \Lambda^{\sim} & \downarrow \\ & \Lambda & \dot{\eta} & \sim & & \sim & & \tilde{\nu} & \hat{A} & \sim \\ & \tilde{\nu} & , & & & & & & \tilde{\gamma} & \end{array}$

```
Ruijie(config)# logging file flash:trace
```

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| 3            |         |
| logging on   |         |
| show logging | щ ъ ъ ъ |
| more flash   |         |

**no logging console**

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**show logging**

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

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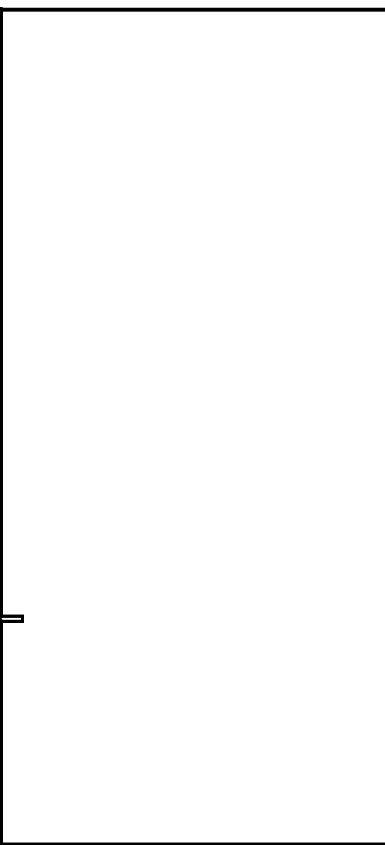
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|-------|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| count | 3 | 7 | 11 | 15 | 19 | 23 | 27 | 31 | 35 | 39 | 43 | 47 | 51 | 55 | 59 | 63 | 67 | 71 | 75 | 79 | 83 | 87 | 91 | 95 | 99 | 103 | 107 | 111 | 115 | 119 | 123 | 127 | 131 | 135 | 139 | 143 | 147 | 151 | 155 | 159 | 163 | 167 | 171 | 175 | 179 | 183 | 187 | 191 | 195 | 199 | 203 | 207 | 211 | 215 | 219 | 223 | 227 | 231 | 235 | 239 | 243 | 247 | 251 | 255 | 259 | 263 | 267 | 271 | 275 | 279 | 283 | 287 | 291 | 295 | 299 | 303 | 307 | 311 | 315 | 319 | 323 | 327 | 331 | 335 | 339 | 343 | 347 | 351 | 355 | 359 | 363 | 367 | 371 | 375 | 379 | 383 | 387 | 391 | 395 | 399 | 403 | 407 | 411 | 415 | 419 | 423 | 427 | 431 | 435 | 439 | 443 | 447 | 451 | 455 | 459 | 463 | 467 | 471 | 475 | 479 | 483 | 487 | 491 | 495 | 499 | 503 | 507 | 511 | 515 | 519 | 523 | 527 | 531 | 535 | 539 | 543 | 547 | 551 | 555 | 559 | 563 | 567 | 571 | 575 | 579 | 583 | 587 | 591 | 595 | 599 | 603 | 607 | 611 | 615 | 619 | 623 | 627 | 631 | 635 | 639 | 643 | 647 | 651 | 655 | 659 | 663 | 667 | 671 | 675 | 679 | 683 | 687 | 691 | 695 | 699 | 703 | 707 | 711 | 715 | 719 | 723 | 727 | 731 | 735 | 739 | 743 | 747 | 751 | 755 | 759 | 763 | 767 | 771 | 775 | 779 | 783 | 787 | 791 | 795 | 799 | 803 | 807 | 811 | 815 | 819 | 823 | 827 | 831 | 835 | 839 | 843 | 847 | 851 | 855 | 859 | 863 | 867 | 871 | 875 | 879 | 883 | 887 | 891 | 895 | 899 | 903 | 907 | 911 | 915 | 919 | 923 | 927 | 931</ |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |

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```
Ruijie(config)# logging count
```

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| 3                  |          |
| show logging count |          |
| show logging       | 6<br>ǎ ѵ |

### 68.1.13 logging rate-limit

$$\hat{A} \quad \text{Ю} \quad \begin{matrix} 8 \\ \Pi \\ \hat{A} \end{matrix} \quad \sim \quad \begin{matrix} 8 \\ \Pi \\ \hat{A} \end{matrix}$$

**logging rate-limit** *number all number console number all number except severity*

**no logging rate-limit**

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*number*                    ъ                    й                    ,  
*all*                                 8 ъ                                 ,  
*console*                    8 ↓ Э                                 ,  
*except*                    ш                                 ъ а                                 8 ,  
й                    ъ                                 а                                 8 ,  
*severity*                    ш                    ъ                    ъ ш                    ъ й

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$$10^8 \hat{A}$$

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

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| 3                  |  |
| logging on         |  |
| service timestamps |  |

### 68.1.16 service timestamps

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```
service timestamps message-type uptime datetime msec year
```

**no service timestamps** *message-type*

**default service timestamps** *message-type*

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message-type ' ' ч Â ш  
 ' ' ш й  
 Â

$$uptime' \quad ||- \quad \sim \quad t \quad \times \quad \sim \quad t$$

*datetime'*

msec

year

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$$\hat{A} = \begin{pmatrix} \hat{A}_{11} & \hat{A}_{12} \\ \hat{A}_{21} & \hat{A}_{22} \end{pmatrix}$$
$$\tilde{O} \quad \{ \quad \hat{O}$$

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3  
Ruijie(config)# **service timestamps debug datetime msec**  
Ruijie(config)#

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```
Ruijie(config)# service sysname
Ruijie(config)# end
Ruijie#
Mar 22 15:35:57 S3250 %SYS-5-CONFIG: Configured from
console by console
```

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| show logging | 6      ă ʘ |

### 68.1.18 more flash

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| logging on    |     |
| clear logging | ǎ ʃ |

## 68.2.2 show logging count

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show logging count

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count 3 Â show logging count 3 √ √  
∞ √ √ √  
show logging 3 √ √ Π √

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Ю show logging count '  
Ruijie# show logging count  
Module Name Message Name Sev Occur Last Time  
=====

|           |          |   |   |                |
|-----------|----------|---|---|----------------|
| SYS       | CONFIG_I | 5 | 1 | Jul 6 10:29:57 |
| -----     |          |   |   |                |
| SYS TOTAL |          |   | 1 |                |

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%A#HDPH#8PHRTDExM#DPH#H#EuHDDPH#5HN#N#6Fb#M#P3m#KPH#D#2gH(f#



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

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| 3             |       |
|---------------|-------|
| logging on    |       |
| clear logging | ǎ ѡ   |
| show logging  | 6 ǎ ѡ |

## 69 POE

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, Poe enable

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```
Ruijie# configure
Ruijie(config)# poe-power lower 46
Ruijie(config)# end
Ruijie#
```

### 69.1.3 poe-power upper upper

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**poe-power upper upper**  
**no poe-power upper**

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```
Ruijie# configure
Ruijie(config)# poe-power upper 56
Ruijie(config)# end
```

#### 69.1.4 poe disconnect-mode mode

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**poe disconnect-mode** *mode*

**no poe disconnect-mode**

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```
Ruijie# configure
Ruijie(config)# poe disconnect-mode dc
```

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

## 69.2

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- **show poe interfaces**
- **show poe powersupply**

### 69.2.1 show poe interfaces

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```
show poe interfaces interface-id
```

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```
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

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```
show poe powersupply
```

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```
Ruijie# show poe powersupply
```

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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

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## 70

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- 、 **device-priority**
- 、 **device-description**
- 、 **show member**

### 70.1

#### 70.1.1 device-priority

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**device-priority member priority**

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| <i>member</i>   | Â √ √    |
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| <i>priority</i> | "I ~ √ й |

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Ruijie(config)# **device-priority 2 8**

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|-------------|--|
| show member |  |
|-------------|--|

## 70.1.2 device-description

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**device-description member** *member description*

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| <b>member</b> <i>member</i> | Â ¤ ¤ ~ |
|-----------------------------|---------|
| <i>description</i>          | ~ ð     |

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Ruijie(config)# **device-description member 2 red-giant**

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| show member |  |

## 70.2

### 70.2.1 show member

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**show member** *member*

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| member | ~ | Â |
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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
```

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