RG-S8600

IPv6

RGOS 10.3(5)

{ x | y | ... }' ÿ ч ↓ Â

[x | y | ...]' ÿ ч ↓ a Â

//' ↰ ù Â

3.

˘

Ю Ю'

~ ' à à Ү Â

& ' à à à Ї Â

&

1) Ъ ↑ ↓ ↓ a ˘

2) Ъ ↑ ↓ è ˘ é
ˆ Л à ~ Ц ù Â

3) Ъ ˘ Ҙ Ю Ю ˘ Ц
Ь Â

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

ঀ ঃ ╠ ˘ ঃ ⁄^ *˜ ˘ ɜ Л
Ю '

*command-alias=original-command

˘ EXEC Ю ঀ ঃ "s" "show" Â "s?"
ঌ Л ঌ 's' ঃ ╠ '

```
Ruijie# s?
*s=show  show  start-chat  start-terminal-service
```

ঃ ঀ ঀ a ˘ ⁄ ঀ Â
˘ EXEC Ю ঃ "sv" ঀ ঀ "**show version**" '

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

ঃ ÿ ঀ ˘ a Â Э
˘ ঀ ˘ a ঃ'

```
Ruijie# s?
show  start-chat  start-terminal-service
```

ঀ ঃ ≠ ঌ Л ঌ ঀ ╠ ˘ Ю
ঀ ঃ "ia" ঀ "ip address" Ю'

```
Ruijie(config-if)# ia ?
A.B.C.D  IP address
dhcp     IP Address via DHCP
Ruijie(config-if)# ip address
```

"ip address" ঀ ⁄ ˘ ɜ ঃ
ঀ Â

ঀ ঃ ˘ a Â

show aliases ঀ ঌ Л ঌ ঃ Â

ð Ô

ЛЮ ˘ Ю ঀ ঃ "def-route" ঀ
"ip route 0.0.0.0 0.0.0.0 192.168.1.1"

```
Ruijie# configure terminal
Ruijie(config)# alias config def-route ip route 0.0.0.0
0.0.0.0 192.168.1.1
Ruijie(config)# def-route?
*def-route="ip route 0.0.0.0 0.0.0.0 192.168.1.1"
```

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

ð ٦ Ô

٦	
show aliases	٫

1.2 privilege

٦ ٦ ˘ ٫ Л Ю
privilege ٦ Â ٦ **no** ٫ Л ٦
и Â

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

ð Ô

mode ' ٦ CLI ٦ Â

[**all**] ' ٦ ٦ ˘ ٫ и ٫ Â

level *level* ' ٦ ٦ ˘ 0-15 Â

reset ' ٦ и Â

command-string ' ٦ Â

ð Ô

ð ٦ Ô

ð Ô

Ю ǂ **privilege** ٦ ٫ CLI ٦ ˘
a ٫ ˘ ٫ ٦ ٫ ٫ ˘ Ю
٫ Л **privilege ?** ٫ CLI ٦ Â

config	

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

ð Ô

ЛЬЮ ˘ CLI 1 ʒ ѝ ”test”˝ **reload** ʒ

mode ' ¿ ¾ ¾ ¾ Â

ð Ô

ð ¾ Ô

EXEC

ð Ô

¾ ˘ ¾ ¿ Â

ð Ô

ЛЬЮ ˘ EXEC Ю ¾ ¿'

```
Ruijie# show aliases exec
exec mode alias:
h                   help
p                   ping
s                   show
u                   undebug
un                  undebug
```

ð ¾Ô

¾	
alias	¾ ¿

2

2.1

ѝ ϡ ˆ CLI˜ ЛЬЮ ϡ'

- **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

ÿ æ ˘
ϡ disable Â

disable [*privilege-level*]

ð Ô

privilege-level

ð ϡ Ô

ð Ô

ϡ ÿ Â ╗ Э ˘
æ Â

&

disable ϡ Λ Â

ð Ô

ЮO æ '

```
Ruijie# disable 10
```

ð ϡ Ô

ϡ	
enable	ÿ ˘ Â

2.1.2 enable

˘ ϡ enable Â

ϡ ê ϡ Ì Â

2.1.3 enable password

a ↓ ϡ˘ ϡ **enable password** Â

ϡ **no** ϡ Â

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

no enable password

ð Ô

Password ' EXEC ϡ Â

Level ' Â

0|7 ' ϡ ╗ ˘ 0 ╗ ˘ 7 ╗ Â

encrypted-password ' ϡ Â

ð ϡ Ô

ð Ô

ֿ Â ЮЎ ׀ 8 ֿ
ׅ ֽ ֽ ˘ ֿ Â

ֽ ЊЖ Ю

¸ 1 26 Â

¸ ֽ ׀Л˘ ˘ Â ѝ ֽ
† Â

~

ϡϯ ѝ password security ϡ ч Âpassword ѝ ╗ ϡ˘
ϕ ѝ 15 ϡ Âsecurity ϡ ѝ ╗ ϡ˘ ϕЛЪ ѝ 0˙ 15
ϡ Â ˘ ϕ ϕ ЛЪЭ ч ϡ˘ password
ϡ a Â 15 password ϡ˘ ˘
╟ ѝ security ϡ’ 15 password ϡ security
ϡ ϕ˘ ’ ϡ ЛЪ╗ ˘ password
ϡ ╗ ˘ security ϡ ╗ Â

ð Ô

Ю ϡ ѝ pw10ơ

ϡ	
enable password	a ⊿ ϡ Â

2.1.6 password

line ϡ˘ line ϡ **password** Â ϡ **no** line ϡ Â

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

no password

ð Ô

password ' line ϡ Â

0|7 ' ϡ ╗ ˘ 0 ╗ ˘ 7 ╗ Â

encrypted-password ' ϡ Â

ð ϡ Ô

line

ð Ô

ϡ line ϡ Â

ð Ô

Ю line ϡ и red

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

ð ϡ Ô

ϡ	
login	ÿ ˘ Â

2.1.7 login

AAA Ю˝ Э ϡ ˘

ð Ô

Â

ð ʒ Ô

line

ð Ô

AAA Ł˘ ʒ ʒ
Â ʒ VTY console ʒ Â

ð Ô

Ю VTY Э ʒ Â

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

ð ʒ Ô

ʒ	
password	line ʒ Â

2.1.8 login local

AAA Ю˜ Э ˘
ʒ **login local** Â ʒ **no** ы Â

login local

no login local

ð Ô

Â

ð ʒ Ô

line

ð Ô

AAA Ł˘ ʒ
Ţ Ò Ń

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

ð ý Ô

ý	
username	Â

2.1.9 login authentication

AAA ÞÖ AAA Ł ˘
ý Â ý **no** Â

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

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

ð Ô

default ' ¸

list-name ' ¬ ¸

ð ý Ô

line

ð Ô

AAA AÈ â AÒÃÊÝíXI2Düõa× 2¯Àradnusthentication

2.1.10 username

username Â

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

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

no username *name*

Ô

Â

Â

0|7 0 7 Â

Â

Â

Ô

Ô

Â

~

Â

8

Ô

15

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

Ô

login local	Â

2.1.11 lock

Э EXEC **lock**

lock

ð Ô

ð Ô

ð Ô

1. **lock**
2. Locked
3. line

Э line **lockable** line Э Â

ð Ô

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

ð Ô

lockable z Â Q ¸ È ü,É ð Ç% Â ðÁ€`•@¥ D!ÿQN0=ñƒ³â

no lockable

ð Ô

ð ֽ Ô

line

ð Ô

ֽ Э в ˘ в ⅄ Л℧
EXEC Ю **lock** ֽ Â

ð Ô

Ю ⁸ Л Э в ℸ ˘ в ⁸ Л'

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

ð ֽ Ô

ֽ	
lock	в Â

2.1.13 telnet

Л telnet Ь ˘ EXEC˄ ~ Ю˘
telnet ֽ Â

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

ð Ô

Host' ў IP ў ⅃'

Port' TCP /ˇ й 23'

Keyword' ⅃ ˘ Ю '

/source-interface	ÿ telnet '

ð Ô

ð Ô

Ô telnet Â

ð Ô

Ю Ô telnet 192.168.1.11˘ ˘ й vlan 1˘ VRF й vpn1'

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

ð Ô

Ô	
Show sessions	'
exit	'

2.1.14 ip telnet source-interface

Э IP й Telnet ˘ Ю˘ Л **ip telnet source-interface** Ô'

ip telnet source-interface *interface-name*

ð Ô

interface-name' Э IP й Telnet '

ð Ô

ð Ô

Ô Э IP й Telnet Â telnet Ô Telnet ˘ й ˘ Â **no ip telnet source-interface** Ô й Â

ð Ô

Ю Ô˘ Loopback 1 Э IP й Telnet '

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

ð Ô

ϡ	
telnet	˩ Telnet Ł '

2.1.15 enable service

б Ł SSH Server/Telnet Server/Web Server/Snmp Agent˜ ˘ Ю˘ ˩Л **enable service** ϡ'

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

ð Ô

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

ð ϡ Ô

ð Ô

ϡ б Ł Â **no enable service** ϡ Ł Â

ð Ô

Ю ϡ' **enable service ssh-sesrver**, SSH Server ╖ '
`Ruijie(Config˜ # enable service ssh-sesrver`

ð ϡ Ô

ϡ	
show service	Ł '

2.2

ЛЬЮ ϡ'

- **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∪ ʒ **clock set** ч
'

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

ð Ô

hh:mm:ss ' ˘ ѝ ^ 24 ⁸ ~ : ¦ :

day ' ^ 1-31~ ˘ Â

month ' ^ 1-12~ ˘

year ' Ѽ ^ 1993-2035~ ˘ a Â

ð ʒ Ô

ð Ô

ʒ ˘ Â

˘ clock set Э
˘ Ю Л˘ Â

ð Ô

Ю ѝ 2003 3 17 Э ' 10 20¦ 30 '

```
Ruijie# clock set 10:20:30 3 17 2003
Ruijie# show clock
```

```
clock: 2003-3-17 10:20:32
```

ð ϡ Ô

ϡ	
show clock	

2.2.2 clock update-calendar

˚ clock ˚ clockˇ privileged EXEC Ю **clock update-calendar** ϡˇ ˚ clock ˚ clock Â

clock update-calendar

ð Ô

ð ϡ Ô

ð Ô

ﾉ ˚ ^ calendar˜ ˈI ˚ ˘ ˚ a ˘ и ˚ ˘ Ю ≠ Â

˚ ˚ a ﾉ ˘ ˚ ˘ ϡ ˚ 8 ˚ Â

ð Ô

Ю ϡ ﾉ Л℧ ˚ clock 8 ˚ clock Â

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

ð ϡ Ô

ϡ

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

2.2.5 session-timeout

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

a

session-timeout *minutes* [*seconds*]

no session-timeout

minutes

seconds

0 min

LINE

LINE

LINE

line vty 0 5 30

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

2.2.6 show clock

show clock

show clock [**detail**]

detail

detail

show clock

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

ð ʒÔ

ʒ	
clock set	

2.2.7 show running-config

ˇ ʒ

month ' ˘ ÿ 1 12

day ' ˘ ÿ 1 31

year ' ˘ ÿ 1993 2035

cancel ' ↓

ð ϡ Ô

ð Ô

ϡ ↓ Л Ъ ╟˘ Â

ð Ô

Ю 10ϟ Л Ъ Л '

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

2.2.10 show reload

╟ ˘ Ю ϡ **show reload** Â

show reload

ð Ô

ð ϡ Ô

ð Ô

ϡ ↓ Л Ъ ╟ Â

ð Ô

Ю ╟ '

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

2.2.11 prompt

ϡ ˘ Ю ϡ **prompt** Â ↓

ϡ ˘ **no prompt** ϡ Â

prompt *string*

ð Ô

string ' ˘ ˩Л 32

ð Ô

ð Ô

˘ ˩ Ù
˩ ˩ ˩ Â EXEC Â

ð Ô

Ю Ù RGOS'

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

2.2.12 banner motd

˘ Ю **banner motd** Â
˩ ˘ **no banner motd** Â

banner motd *c message c*

ð Ô

c ' ˘ a

message '

ð Ô

ð Ô

˩Л ˘ ˘
Â ˩ ˩ Ÿ ˘
Â

ð Ô

Ю '

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

2.2.13 banner login

˘ Ю ʒ **banner login** Â
ɻ ˘ **no banner login** ʒ Â

banner login *c message c*

ð Ô

c ' † ˘ a
message '

ð ʒ Ô

ð Ô

ʒ ɻ Л˘ ˘ ˘
Â † Л Ÿ ˘
Â

ð Ô

Ю '

```
Ruijie(config)
Ruijie(config)# banner login $ enter your password $
```

2.2.14 speed

˘ Ю˝ ʒ **speed** *speed* Â
˘ **no speed** ʒ Â

speed *speed*

ð Ô

Speed ˘ Æ bps Â ˘ ɻ
ѝ 9600 à 19200 à 38400 à 57600 à 115200 ˘
9600 Â

ð ʒ Ô

ð Ô

9600

ð Ô

ʒ Â

ð Ô

Ю ѝ 57600 bps'

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

2.2.15 show line

˘ ЮЎ ϡ **show line** Â

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

ð Ô

console ' ⁸ ⁄

vty ' vty

line-num ' line

ð ϡ Ô

ð Ô

ð Ô

ϡ˘ Â

ð Ô

Ю console '

```
Ruijie# show line console 0
CON     Type    speed   Overruns
* 0     CON     9600    45927
Line 0, Location: "", Type: "vt100"
Length: 24 lines, Width: 79 columns
Special Chars: Escape  Disconnect  Activation
             ^^x     none       ^M
Timeouts:      Idle EXEC    Idle Session
             never        never
History is enabled, history size is 10.
Total input: 53564 bytes
Total output:  395756 bytes
Data overflow:  27697 bytes
stop rx interrupt:  0 times
```

2.2.16 write

ˆ ╟ ~ ˘

ʒ **write** Â

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

ð Ô

memory ' ˆ running-config˜ NVRAM˝ ⊿ copy running-config startup-config Â

network ' TFTP ⊾ Э˘ ⊿ copy running-config tftp Â

terminal ' ˘ ⊿ **show running-config** Â

ð ʒ Ô

ð Ô

ˆ ╢ Q M

3 LINE

3.1 LINE

3.1.1 line

LINE ˘ ЛuЮ ٶ'

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

ð Ô

console	8
vty	˘ telnet/ssh
First-line	first-line /ł
Last-line	last-line /ł

ð Ô

ð ٶ Ô

ð Ô

LINE

ð Ô

LINE VTY 1 3 LINE '

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

ð ٶ Ô

3.1.2 line vty

ٶ ٦ Л ╗ ٦ Л VTY Â ٶ **no** ٦ Л ٦ Л VTY Â

line vty *line-number*

no line vty *line-number*

ð Ô

ЮЎ ┘ VTY й 5Ў /Ї й 0--4 Â

ð ¾ Ô

ð Ô

╕ ┘ VTY ˇ ┘Л Э ¾ Â

ð Ô

┘ VTY ╕ 20Ў ┘ VTY /Ї й 0--19 Â

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

┘ VTY 10Ў ┘ VTY /Ї й 0—9 Â

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

ð ¾ Ô

3.1.3 transport input

Line Ю ┘Л ˇ **transport input** ¾ Line Ю ┘Л Â **default transport input** й LINE Ю й Â

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

default transport input

ð Ô

all	Line ЮЎ Â
ssh	Line ЮЎ ┘ SSH Â
telnet	Line ЮЎ ┘ Telnet Â
none	Line ЮЎ a Â

ð Ô

˘ VTY Â è TTY ѝ
NONE˘ a Â ٫ Л∪ Л˘ ٫ Л∪
default transport input ٪ ѝ Â

ð ٪ Ô

Line

ð Ô

٪ Line Ю Â VTY Ю˘
Â Л˘ ٬ ٫ Л∪
VTY Э ╖ Â **show running** ٪ Line Ю Â

~

default transport input ٪ Â**no transport inp ut** ٪˘ LINE Ю Â б **transpo rt input none** ٫ Â

ð Ô

line vty 0 4 Ю˘ ٬ telnet '

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

ð ٪ Ô

٪	
show running	Â

ð Ô

˚ RGOS10.1 Л∪ Э

3.1.4 access-class

Line Ю ACL^ ⁸ ˜ Â **access-class** *acl-no* { **in | out** } ٪ Line Ю ⁸ Â no **access-class** *access-list-number* {**in | out**} ٪ ٬ LINE Ю ACL Â

[**no**] **access-class** *access-list-number* {**in | out**}

ð Ô

LINE

4

4.1

ў CLI Ю COPY Â

- Xmodem **copy xmodem**
- Tftp **copy tftp**

4.1.1 copy xmodem

xmodem Э Ю Â

copy flash: *filename* **xmodem**

copy xmodem flash: *filename*

filename Э Â

Ю : ÿ ў xmodem Э ў Â

Э Ю Э

copy xmodeam flash:”filename” **copy flash:**”filename” xmodeam

---

Ю Э Ю

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

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

ð ϡ Ô

ϡ

4.1.2 copy tftp

tftp ˇ ϡˇ tftp Э Ю Â

copy flash: *filename* **tftp**:// l*ocation* / *filename*

copy tftp:// l*ocation*/*filename* **flash:** *filename*

copy flash: *filename* **tftp**:// l*ocation* / *filename* **vrf** vrfname

copy tftp:// l*ocation*/*filename* **flash:** *filename* **vrf** vrfname

ð Ô

filename' Э ˚ ɻ Â

vrfname' vrf ɻ Â

ð Ô

Â

ð ϡ Ô

ð Ô

╖ ˇ ˚ Â ˇ Â
TFTP ┘Ո ˚ ˇ ў ˚ à ˚ Â TFTP
Â

~

˚ ɻ ˇ tftp ╖ Э ʌˇ '

copy tftp:"//location/filename" **flash:**filename **vrf** vrfname

ɻ ˇ ˚ ɻ ˇ ≠ ˚ ɻ ╖ Э ʌ

copy tftp://localtion/filename **flash:**"filename" **vrf** vrfname

---

ð Ô

Ю ' ÿ ў ^ ip 192.168.12. 1˜˜
˚ ^ config.bak˜ ; γ ÿ ˚ ^ switch.bin˜
ў ^ ip 192.168.12.1˜'

```
Ruijie# copy tftp://192.168.12.1/confg.bak flash:
config.text
```

Ruijie# **copy flash**: *swhich.bin* **tftp**:*//192.168.12.1/confg.bak*

5

5.1

é ЛЪЮ ¢'

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

5.1.1 ping

¢ ˘ ↓ Л Ъ ╠ à Æ
Â ¢ Ю'

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

ð Ô

vrf-name	VRF ↓
ip-address	IPv4 Â
length	
times	
timeout	
data	Ї
source	IPv4

ð Ô

^ и 2 ~ ˘ 5 и 100Byte
IP Â

ð ¢ Ô

ð Ô

Ping ¢ Ю˝ Ю˝
↓ ping ╖ ˘ Ю˝ ↓ Л Ъ ping

ℸ Â ping ℸ ˘ ⅃ Л Ю
˘ ˆ ѝ 2 ~ ˘ 5 ѝ 100Byte
IP ˘ ˘ Ļ ! Ľ˘ ˘
Ļ . Ľ˘ ⅄ Â ping ℸ ˘ ⅃
Ю ˘ ping ˘ ⅃ Л ȁ ˘
˘ ping ℸ ˘ ⅄ ≠ Â
⅄ ℸ ˘ ″I ⅄ Ь ˘ ε DNS
† Â

ð Ô

Ip-address	IPv4 Â
number	
source-address	IPV4
seconds	
minimum maximum	TTL

ð ३ Ô

ð Ô

traceroute ३ ў ˘ ˘
Æ Æ Â ɹ ╖ ˘ ″I ɹ Ŀ ˘ é
DNS ţ Â

ð Ô

ЛЪЮ ѝ traceroute ч ˘ ѝ ˘ ѝ
a Â

1 à traceroute '

```
Ruijie# traceroute 61.154.22.36
< press Ctrl+C to break >
Tracing the route to 61.154.22.36
1     192.168.12.1    0 msec  0 msec  0 msec
2     192.168.9.2     4 msec  4 msec 4 msec
3     192.168.9.1     8 msec  8 msec  4 msec
4     192.168.0.10    4 msec  28 msec  12 msec
5     202.101.143.130    4 msec  16 msec  8 msec
6     202.101.143.154   12 msec  8 msec  24 msec
7     61.154.22.36    12 msec  8 msec  22 msec
```

ÿ Э ˘ ɻ Л ˘ ÿ IP ѝ 61.154.22.36
ў ˘ ˆ 1˙ 6˜ ˘ ɻ
˘ ţ ˘ Â

2 à a traceroute '

```
Ruijie# traceroute 202.108.37.42
< press Ctrl+C to break >
Tracing the route to 202.108.37.42
1     192.168.12.1    0 msec  0 msec  0 msec
2     192.168.9.2       0 msec  4 msec 4 msec
3     192.168.110.1    16 msec  12 msec  16 msec
4     *  *  *
5     61.154.8.129     12 msec  28 msec  12 msec
```

```
6     61.154.8.17       8 msec  12 msec  16 msec
7     61.154.8.250     12 msec  12 msec  12 msec
8     218.85.157.222    12 msec  12 msec  12 msec
9     218.85.157.130    16 msec  16 msec  16 msec
10     218.85.157.77    16 msec  48 msec  16 msec
11     202.97.40.65     76 msec  24 msec  24 msec
12     202.97.37.65     32 msec  24 msec  24 msec
13     202.97.38.162    52 msec  52 msec  224 msec
14     202.96.12.38      84 msec  52 msec  52 msec
15     202.106.192.226    88 msec  52 msec  52 msec
16     202.106.192.174    52 msec  52 msec  88 msec
17     210.74.176.158    100 msec  52 msec  84 msec
18     202.108.37.42     48 msec  48 msec  52 msec
Ruijie#
```

ÿ Э ˘ ˩ Л∪ ˘ ÿ IP ѝ
202.108.37.42 ў ˘ ˆ 1˙ 17˜ ˘ з
4 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
```

ð ⅄ Ô

٪ Э Â

5.1.3 Line-detect

line-detect ३ ˇ ˩ Л Â

line-detect

ð Ô

ð ३ Ô

ð Ô

line-detect ३ ў ˇ ^ ~
ˇ Æ Æ Â

ð Ô

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

३ '

३	
pairs	ˇ ˩ Â

State OK ´ ~
Â ˥ ˇ /ı
ˇ Л ˩ ø Ò Ò3 a ه

S8600 ˘ ╖ ↙ Ю ´ '

M8600_48GT_4SFP_POE_II
M8600_48GT_4SFP_E
M8600_48GT_4SFP_E_II

6

6.1

ЛЪЮ

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

6.1.1 interface aggregateport

no

interface aggregateport *port-number*

port-number Aggregate port

aggregate port aggregate port

aggregate port α Â **show interfaces** **show interfaces aggregateport** Â

ð Ô

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

ð Ô

show interfaces	Â

ð Ô

S8600 Ò ò Ò

6.1.3 interface vlan

ৡ ৡ˘ ╟ ^ switch virtual interface˘ SVI˜ ˘ Â ৡ **no** SVI Â

interface vlan *vlan-id*

no interface vlan *vlan-id*

ð Ô

vlan-id ' VLAN ID˘ ¤ Â

ð ৡ Ô

ð Ô

show interfaces **show interfaces vlan** ৡ

ð Ô

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

ð ৡ Ô

ৡ	
show interfaces	Â

ð ✓ Ô

S8600 '

¸ 2K SVI

¸ 2K IP

6.1.4 medium-type

Â ৡ **no** .

medium-type { **fiber | copper** }

no medium-type

ð Ô

fiber ' ″I Â

copper ' Â

ð Ô

Â

ð ϡ Ô

ˆ ˘ a Ap SVI˜

ð Ô

ﻝ ﻝ Л Ў ″I ч ˘ ﻝ è Â
Л˘ ˘ à ﻝ à ⁸
˘ Â ﻝ Л˘
ѝ è ˘ ﻝ Л Â

ð Ô

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

ð ϡ Ô

ϡ	
show interfaces	Â

ð Л Ô

24SFP/12GT ´ 12 SFP 12 10/100/1000M BASE-T
╟ ⁋ Â

a ╟ SFP

ð Ô

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

ð ৡ Ô

ৡ	
show interfaces	Â

6.1.6 shutdown

˘ ৡ Â ৡ **no** Â

shutdown

no shutdown

ð ৡ Ô

ð Ô

ˆ Л ầ Ap ầ SVI ˜ ˘ ৡ ˘ è Ÿ ˘ a Â **show interfaces** ৡ Â

ð Ô

Ap 1'

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

Ap 1'

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

ð ৡ Ô

ৡ	
clear interface	˚ Æ Â
show interfaces	Â

&

no shutdown ˘ ┘
Â

6.1.7 speed

Â ϡ **no**

ð Ô

10 ' ѝ 10Mbps Â
100 ' ѝ 100Mbps Â
1000 ' ѝ 1000Mbps Â
10G ' ѝ 10Gbps Â
auto ' ѝ Â

ð Ô

Â

ð ϡ Ô

ð Ô

Ap ˘ Ap ¤ ˘ ┘Л
˘ a Â Ap Â
show interfaces ϡ Â a ┘˘ ≠
a ┘ Â ˘ SFP a ѝ 10M 100M Â

ð Ô

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

ð ϡ Ô

ϡ	
show interfaces	Â

6.1.8 duplex

Ю˘ ϡ ┤ Â ϡ **no**
ѝ

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

no duplex

ð Ô

auto' ϟ ϟ Â
full ' ϟ Â
half' ϟ Â

ð Ô

ϟ ϟ Â

ð ϡ Ô

ð Ô

ϟ б Â ϟЛυ **show interfaces** ϡ
ϟ Â

ð Ô

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

ð ϡ Ô

ϡ	
show interfaces	Â

6.1.9 flowcontrol

ϡ ⁸ Â ϡ no ѝ

flowcontrol {**auto** | **off** | **on**}

no flowcontrol

ð Ô

auto' ⁸ Â
off ' ⁸ Â
on ' ⁸ Â

ð Ô

⁸ Â

ð ϡ Ô

ð Ô

show interfaces ⁸ ⁸ Â

ð Ô

¨l Л∪ 1/1 ⁸ '

```
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# flowcontrol on
```

ð ϡ Ô

ϡ	
show interfaces	Â

6.1.10 mtu

mtu

Mtu *num*

ð Ô

num' 64 9216(65536 a ⊿ a ⊿)

ð Ô

и 1500 Â

ð ϡ Ô

ð Ô

mtû ~ Â ⊿

ð Ô

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

ð ϡ Ô

ϡ	
show interfaces	Â

6.1.11 carrier-delay

Ю ϡ **carrier-delay** ˘

ϡ **no** Â

carrier-delay [*seconds*]

no carrier-delay

ð Ô

seconds ' ˩ ˘ Л∪ ѝ Æ˘ 1˙ 60

ð Ô

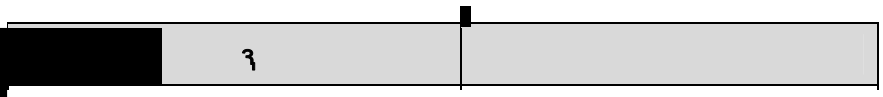
2

ð ʒ Ô

ð Ô

/ł DCD ÿ Down Up

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



show interfaces Â

switch port trunkˇ ⅃Ո VLAN Â
⅃Ո VLAN ⅃ VLAN ᾱ ˇ trunk port
⅃ VLAN VLAN Â ⅃Ո **switchport trunk**
ϡ ⅈ⅍ ⅃ VLAN

ð Ô

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

ð ϡ Ô

ϡ	

VLAN VLAN ID Trunk native VLAN
UNTAG

VLAN

Trunk VLAN 1 4094

Trunk VLAN VLAN 8

switchport

1/15

```
terface fastethernet 1/15
 switchport trunk allowed vlan remove

 end
faces fastethernet1/15 switchport
led

ative vlan is 1
led
```

	show interfaces	
	switchport access	statics accessport VLAN

6.1.18 snmp trap link-status

LinkTrap Link SNMP LinkTrap, a

no

ð Ô

ˆ Л υ à Ap à SVI ˜ ˘ ʒ
LinkTrap˘ ╖ ˘ Link ↓ ˘ SNMP
LinkTrap, √ a Â

ð Ô

Ю й a Link trap'

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

Ю й Link trap'

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

ð Ô

Â

ð ϡ Ô

ð Ô

a ╗ ˘ Â

ð Ô

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

ð ϡ Ô

ϡ	
duplex	┤ Â
flowcontrol	⁸ Â
interface gigabitEthernet	Л∪ ˆ ¨l Л∪ ~˘ Â
interface aggregateport	˘ Â
interface vlan	╟ ˆ switch virtual interface˘ SVI˜ ˘ Â
shutdown	˘ ϡ Â
speed	Â
switchport priority	802.1q ¨l Â
switchport protected	и Â

7 Aggregate Port

7.1

7.1.1 port-group

ѝ Aggregate Port Â ¾ no
Aggregate Port Â

port-group *port-group-number*

no port-group

ð Ô

a Aggregate Port

ð Ô

port-group-number	Aggregate Port /Ì˘ Aggregate Port /Ì

ð ¾ Ô

ð Ô

AP ˩ VLAN ˘ trunk port Â
a ˩ native VLAN a AP

ð Ô

Ю Л↓ 1/3 AP 3 '

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

ð ˥ Ô

S8600

¸ 8

¸ 128 AP

7.1.2 aggregateport load-balance

AP Â ҃ no
ѝ Â

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

no aggregateport load-balance

ð Ô

dst-mac	MAC ↑ Â AP ˘ MAC ↵ ↵ ˘ MAC a ↵ ↑ a ↵
src-mac	MAC ↑ Â AP ˘ a ↵ MAC ↑ a ↵ ˘ ↵ MAC ↵
src-dst-ip	IP б IP ↑ Â a ↵ IP—— IP a ↵ ˘ ↵ IP—— IP ↵ Â Ь ˚ Ю˝ Â
dst-ip	IP ↑ Â AP ˘ IP ↵ ↵ ˘ IP a ↵ ↑ a ↵
src-ip	IP ↑ Â AP ˘ a ↵ IP ↑ a ↵ ˘ ↵ IP ↵
src-dst-mac	MAC б MAC ↑ Â a ↵ MAC—— MAC a ↵ ˘ ↵ MAC—— MAC ↵ Â

ð Ô

MAC ↑

ð ҃ Ô

ð Ô

show aggregateport load-balance ҃

ð Ô

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

ð ҃ Ô

҃	

show aggregateport load-balance	aggregateport Â

ð ¼ Ô

S8600

7.2

7.2.1 show aggregateport

aggregateport Â

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

ð Ô

aggregate-port-number	Aggregate Port ¼ Â aggregaye port Â aggregate port Â
load-balance	
summary	

ð ¾ Ô

ð Ô

aggregate port ¼˘ aggregate port

ð Ô

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

ð ¾Ô

¾	

8 LACP

8.1

8.1.1 lacp port-priority

LACP ″I Â ৡ no Â

lacp port-priority *port-priority*

no lacp port-priority

port-priority	″I Â ↓ и 0-65535

″I и 32768 Â

ৡ Â

, ″I ″I , ″I ̀и ў

,, ↓ ᾱ ″I ȯ

8.1.2 port-group mode

LACP ID Л Â ३ no ৸
б LACP Â

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

no port-group

Key	ID, key ৸ a ৶ a ৶ ৸ Â
active	ў ╟ LACP Â
passive	a ў ╟ LACP ˘ LACP Л ╟ б LACP .

a б LACP Â

३ Â

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

३	
३	

lacp port-priority

port-priority	″I Â ↓ ѝ 0-65535

″I ѝ 32768 Â

ৡ Â

, ″I ″I , ″I ѝ ў
,, ↓ ᾱ ″I Â

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

ৡ	
port-group *key* **mode**¸ **active** | **passive**ˀ **port-group** *key* **mode**	LACP ID Â

↓

↓	
-	-

8.1.4 lacp system-priority

LACP ″I Â ৡ no Â

lacp system-priority *system-priority*

no lacp system-priority

system-priority	LACP ″I ˘ 0-65535 Â

Â

˝| '

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

¾

```
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
```

Local information	LACP Â
Port	ID Â
Flags	' Ļ S' LACP ˘ LACPPDU ' 'A' ў ╠ Â
State	' ľ bndl Ł ˘ Down ˘ sups Â

9 VLAN

9.1

9.1.1 vlan

¾ VLAN ¾ Â ¾ no VLAN Â

vlan *vlan-id*

no vlan *vlan-id*

ð Ô

vlan-id	VLAN ID /I Â ' VLAN˜ VLAN 1˜ a Â

ð ¾ Ô

ð Ô

˘ **end** ¾˘ **Ctrl+C** Â

˘ **exit** ¾

ð Ô

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

ð ¾Ô

¾	
show vlan	VLAN Â

ð ./ Ô

S8600 4093 vlan

9.1.2 name

VLAN ¸ Â ¾ **no** Â

name *vlan-name*

no name

ð Ô

vlan-name	VLAN ¸

ð Ô

VLAN ¸

ð ¾ Ô

VLAN

ð Ô

show vlan ¾ vlan

ð Ô

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

ð ¾Ô

¾	
show vlan	VLAN Â

9.1.3 switchport mode

¾ γ ˆ switch port˜ ˇ ¸Л υ ϶ access port ϶ trunk port, ϶ 802.1Q Â ¾ no ϶ Â

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

no switchport mode

ð Ô

access	switch port ϶ access port Â
trunk	switch port ϶ trunk port Â

ð Ô

switch port ϶ access

ð ¾ Ô

ð Ô

switch port access˘ ˩ ˥ VLAN
Â ˩ Л **switchport access vlan** ¾ VLAN
Â

switch port trunk˘ ˩ Л VLAN Â
˩ Л VLAN ˩ VLAN ¤ ˘ trunk port
˩ VLAN VLAN Â ˩ Л **switchport trunk**
¾ ⊮ ˩ VLAN

ð Ô

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

ð ¾ Ô

¾	
switchport access	˥ statics accessport˝ ˥ VLAN Â
switchport trunk	˥ trunkport native VLAN Trunk ˩ VLAN Â

9.1.4 switchport access

¾ ˥ access port˝ ˥ VLAN
Â ¾ **no** VLAN Â

switchport access vlan *vlan-id*

no switchport access vlan

ð Ô

vlan-id	╗ VLAN ID Â

ð Ô

switch port ˥ access˘ VLAN ˥ VLAN 1

ð ¾ Ô

ð Ô

VLAN ID Â VLAN ID˘
VLAN˘ ¼ VLAN Â
VLAN ID˘ ╗ VLAN Â

trunkport˘

ð Ô

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

ð ¾ Ô

¾	
switchport mode	γ ˆ switch port˜ Â
switchport trunk	¼ trunkport native VLAN Trunk ┘ VLAN Â

9.1.5 switchport trunk

¼ trunkport native VLAN Trunk ┘ VLAN Â ¾ **no** trunk ¼ Â

switchport trunk {**allowed vlan** { **all** | [**add** | **remove** | **except**] *vlan-list* }| **native vlan** *vlan-id*}

no switchport trunk {**allowed vlan** | **native vlan** }

ð Ô

	Trunk ┘ VLAN Â vlan-list ┘ Л VLAN˘ ≠ ┘ Л VLAN˘ Л VLAN ID ˘ Л /LAI ID ˘ ˆ -˜ /! Â 0-20 Â ┘ Л ˆ ,˜ /!

allowed vlan *vlan-list*

ð Ô

┘ VLAN allˇ Native VLAN VLAN 1

ð ¾ Ô

ð Ô

Native VLANˇ

ù Trunkˇ native VLAN Â native VLANˇ
Э UNTAG ˘ ù VLAN Â
˘ VLAN ID IEEE 802.1Q PVID˜ native
VLAN VLAN ID Â ┘ ˘ Trunk Э native VLAN ˘
UNTAG Â

┘ VLAN '

Trunk ┘Л VLAN 1˙ 4094˜ Â
˘ ≠ ┘Л Trunk ┘ VLAN ⁸ VLAN
a Trunk Â

show interfaces switchport ¾ Â

ð Ô

Ю VLAN 2 ÿ 1/15 '

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

ð ¾Ô

¾	
show interfaces	Â
switchport access	ù statics accessportˇ ù VLAN Â

9.2

9.2.1 show vlan

VLAN Â

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

ð Ô

vlan-id	VLAN ID /I Â

ð Ô

ð ¾ Ô

ð Ô

˘ **end** ¾˘ **Ctrl+C** Â

˘ **exit** ¾

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 ¾Ô

¾	
name	VLAN ¿ Â
switchport access	¶ Vlan Â

10 Super-vlan

10.1

10.1.1 supervlan

¢ VLAN ¤ **supervlan** Â

supervlan

no supervlan

ð Ô

ð ¢ Ô

VLAN

ð Ô

˘ **end** ¢˘ **Ctrl+C** â

Vlan-id-list	VLAN subvlan ID, ¿ vlan

ð ¾ Ô

VLAN

ð Ô

no subvlan supevlan subvlan

ð Ô

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

ð ¾Ô

¾	
show supervlan	supervlan Â

ð ¿ Ô

10.1.3 subvlan-address-range

¾ subvlan ip Â

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

no subvlan-address-range

ð Ô

start-ip	SubVLAN IP
end-ip	SubVLAN IP

ð ¾ Ô

VLAN

ð Ô

˘ **end** ¾˘ **Ctrl+C** Â

˘ **exit** ¾

ð Ô

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

ð ¾Ô

¾	
show supervlan	supervlan Â

ð ¼ Ô

10.1.4 proxy-arp

¾ VLAN ARP ¾ ¶ Â

proxy-arp

no proxy-arp

ð Ô

ð ¾ Ô

VLAN

ð Ô

˘ **end** ¾˘ **Ctrl+C** Â

˘ **exit** ¾

ð Ô

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

ð ¾Ô

¾	
show supervlan	supervlan Â

ð ¼ Ô

10.2

10.2.1 show supervlan

¾ SuperVLAN è SubVLAN Â

show supervlan

show supervlan id *vlan-id*

ð Ô

vlan-id	VLAN ID

ð ¾ Ô

ð Ô

ð 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*

11.1.1 protocol-vlan ipv4 addr mask addr vlan id

IP à Л∪ VLAN↑

ð Ô

addr ' IP ˘ Л∪ x.x.x.x

id ' VLAN ID˘ 1- VLAN

ð Ô

ð ٣ Ô

ð Ô

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

ð ٣Ô

show protocol-vlan ipv4

no protocol-vlan ipv4 *addr* **mask** *addr*

no protocol-vlan ipv4

ð ٧ Ô

˚ RGOS10.1 Л∪Э

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

Л∪ profile

ð Ô

num ' profile

type ' Л

ð Ô

ð ¾ Ô

ð Ô

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

ð ¾Ô

show protocol-vlan profile

show protocol-vlan profile *num*

no protocol-vlan profile

no protocol-vlan profile *num*

ð Ô

RGOS10.1 ЛЭ

11.1.3 protocol-vlan profile num vlan id

profile

ð Ô

num' profile

id VLAN ID 1- VLAN

ð ¾ Ô

ð Ô

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

ð ¾Ô

show protocol-vlan profile

show protocol-vlan profile *num*

no protocol-vlan profile

no protocol-vlan profile *num*

RGOS10.1

11.2

show protocol-vlan

11.2.1 show protocol-vlan

Protocol VLAN

show vlan protocol-vlan

12 PrivateVLAN

12.1

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

12.1.1 private-vlan type

VLAN й VLAN

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

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

ð Ô

community ' й community VLAN

isolated ' й isolated VLAN

primary ' й primary VLAN

no ' VLAN

ð Ô

ð ¾ Ô

VLAN

ð Ô

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

ð ¾Ô

show vlan private-vlan

ð Ô

˚ RGOS10.1 ЛЬЭ

ð Ô

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

ð ¾Ô

show vlan private-vlan

no switchport private-vlan host-association

ð Ô

p_vid ' primary VID

s_vid ' secondary VID

no : ÿ VLAN ÿ

ð Ô

ð ֽ Ô

ð 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
```

ð ֽ Ô

show vlan private-vlan

ð ֽ Ô

˚ RGOS10.1 Л Э

12.1.6 switchport private-vlan association trunk

private VLAN trunk primary VLAN secondary VLAN

switchport private-vlan association trunk *p_vid s_vid*

no switchport private-vlan association trunk *p_vid s_vid*

ð Ô

p_vid ' primary VID

s_vid ' secondary VID

no : ÿ VLAN ÿ

ð ֽ Ô

ð Ô

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

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

ð ¾Ô

show vlan private-vlan

ð ¼ Ô

¯ RGOS10.3(5)ЛЬЭ

12.1.7 switchport private-vlan mapping

private VLAN secondary VLAN

switchport private-vlan mapping *p_vid* {*svlist*|**add** *svist* |**remove** *svlist*}

no switchport private-vlan mapping

ð Ô

p_vid ' primary VID

svlist ' secondary VLAN list

no ' ¼ secondaryVLAN

ð Ô

ð ¾ Ô

VLAN

ð 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
```

ð ¾Ô

show vlan private-vlan

ð ¼ Ô

¯ RGOS10.1 ЛЬЭ

12.2

ð ¾ Ô

ð Ô

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

ð ¼ Ô

˚ RGOS10.1 Л Э

12.3.2 switchport hybrid native vlan

switchport hybrid native vlan *vid*

ð ¾ Ô

ð Ô

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

ð ¼ Ô

RGOS10.1 Л Э

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

й 802.1Q tunneling

switchport mode dot1q-tunnel

no switchport mode

ð Ô

no 802.1Q tunneling

ð Ô

802.1Q tunneling

ð ҳ Ô

ð Ô

Ю й dot1q-tunnel

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

ð ҳ Ô

show vlan

ð ↓ Ô

˚ RGOS10.1 Л Э

13.1.2 switchport mode uplink

й uplink

switchport mode uplink

no switchport mode

ð Ô

no ' ↓ uplink

ð Ô

uplink

ð ҳ Ô

ð Ô

Ю й uplink

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

ð ҳ Ô

show vlan

ð ↓ Ô

˚ RGOS10.1 Л Э

13.1.3 switchport dot1q-tunnel allowed vlan

dot1q-tunnel ↓ vlan

switchport dot1q-tunnel allowed vlan [**add**] {**tagged|untagged**} *v_list*

switchport dot1q-tunnel allowed vlan remove *v_list*

no switchport dot1q-tunnel allowed vlan

ð Ô

tagged : tag

untagged : a tag

v_list **:** vlan id

no ' ↓

ð Ô

↓ vlan 1˘ untagged

ð ҳ Ô

ð Ô

Ю dot1q-tunnel vlan 3-6 ѝ ↓ vlan˘ tag

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

ҳ Ô

show interface dot1q-tunnel

↓ Ô

˚ RGOS10.3 Л Э

13.1.4

dot1q-tunnel vlan id

sw4tchport dot1q-tunnel native vlan*vid*

no sw4tchport dot1q-tunnel native vlan

ð Ô

vid vlan id

no' vlan ѝ 1

ð Ô

vlan ѝ 1

ð ҳ Ô

ð Ô

Ю dot1q-tunnel vid ѝ 8

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

ð ৡ Ô

show interface dot1q-tunnel

ð ⊿ Ô

˚ RGOS10.3 Л Э

13.1.5 dot1q outer-vid

tunnel Э˘ vid ╗

dot1q outer-vid *vid* **register inner-vid** *v_list*

no dot1q outer-vid *vid***er inner-vid** *v_list* vidTj /C

ruijie(con

RGOS10.3 Л Э

13.1.6 dot1q relay-vid

access trunk hybrid Э vid

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

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

ð Ô

v_list vid

vid Л tag vid

no Л

ð Ô

ð ֽ Ô

ð Ô

Ю tag

vid '

no '

ð Ô

ð Ô

ð Ô

Ю й 1.1.1.1 vid й 3

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

ð Ô

show traffic-redirect

ð Ô

RGOS10.3

13.1.8 traffic-redirect access-group acl inner-vlan

access trunk hybrid vid

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

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

ð Ô

acl '

vid '

no'

ð Ô

ð Ô

ð Ô

Ю й 1.1.1.2 vid й 6

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

ð ҷ Ô

show traffic-redirect

ð ѵ Ô

˚ RGOS10.3 ЛЪЭ

13.1.9 traffic-redirect access-group acl nested-vlan

dot1q-tunnel ˘ vid ╗

traffic-redirect access-group *acl* **nested-vlan** *vid* **in**

no traffic-redirect access-group *acl* **nested -vlan**

ð Ô

acl ' ┐ acl

vid ' ╗ vid

no ' ѵ vid ╗

ð Ô

ð ҷ Ô

ð Ô

Ю й 1.1.1.3 ╗ vid й 9

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

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

ð ৲Ô

show traffic-redirect

ð ✓ Ô

˚ RGOS10.1 Л Э

13.1.10 frame-tag tpid tpid

tpid

/ ↓ tag ″I tag ⁸

inner-priority-trust enable

no inner-priority-trust enable

ð Ô

no ' ↓ tag ″I tag ⁸

ð ३ Ô

ð Ô

ЮO tag ″I tag ⁸

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

ð ३ Ô

show inner-priority-trust

ð ↓ Ô

˚ RGOS10.1 Л∪Э Â

13.1.12 l2protocol-tunnel

dot1q-tunnel γ

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

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

ð Ô ñÑ0?|1ñot1q-tunnelF0?c0,8ÉÇ'— Ñ1î

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

ð ҃Ô

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

ð ѵ Ô

˚ RGOS10.3 Л Э

13.1.13 l2protocol-tunnel *proto-type* enable

Ү Т

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

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

ð Ô

stp ' stp

gvrp ' gvrp

no ' ѵ

ð ҃ Ô

ð Ô

Ю Э Ү Т

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

ð ҃Ô

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

ð ѵ Ô

˚ RGOS10.3 Л Э

13.2

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

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

13.2.1 show dot1q-tunnel

dot1q-tunnel

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

ð Ô

intf-id '

ð Ô

ð ¾ Ô

ð Ô

```
ruijie#
```

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

RGOS10.3

13.2.3 show frame-tag tpid

tpid

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

intf-id

a tpid

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

RGOS10.1

ð Ô

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

ð Ô

RGOS10.1

13.2.5 show registration-table

dot1q-tunnel vid

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

ð Ô

intf-id

ð Ô

ð Ô

ð Ô

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

ð Ô

RGOS10.3

13.2.6 show translation-table

access,trunk,hybrid vid

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

ð Ô

intf-id

ð Ô

ð ϧ Ô

ð Ô

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

ð ϻ Ô

˚ RGOS10.3 Л Э

13.2.7 show traffic-redirect

vid ϟ ╗

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

ð Ô

intf-id '

ð Ô

ð ϧ Ô

ð Ô

```
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
```

ð ϻ Ô

˚ RGOS10.3 Л Э

13.2.8 show l2protocol-tunnel

γ

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

ð Ô

gvrp ' gvrp

stp ' stp

ð Ô

ð ҃ Ô

ð Ô

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

ð ⊿ Ô

˚ RGOS10.3 Л Э

14 MAC

14.1

ЛЪЮ ʒ

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

14.1.1 mac-address-table aging-time

╟ Â ʒ no Â

mac-address-table aging-time *seconds*

no mac-address-table aging-time

ð Ô

seconds ' ╟ ˘ Лъ ѝ Æ Â ¤ Â

ð Ô

300 Â

ð ʒ Ô

ð Ô

show mac-address-table aging-time ¾ Â

show mac-address-table dynamic ¾ ╟ Â

ð Ô

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

ð ¾Ô

¾	
show mac-address-table aging-time	╟ Â
show mac-address-table dynamic	╟ Â

14.1.2 clear mac-address-table dynamic

╟ Â

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

ð Ô

३

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

ð Ô

static	Â
address *mac-addr*	Â
interface *interface-id*	Â
vlan *vlan-id*	VLAN Â

ð ƻ Ô

ð Ô

ɻ Ո **show mac-address-table static** ƻ

ð Ô

Ю MAC ѝ 00d0.f800.073c '

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

ð ƻ Ô

VLAN ╠ ╖ VLAN
MAC Э a
й Л Â

Ю VLAN1 ╠ й 160

```
Ruijie#configure terminal
Enter configuration commands, one per line.  End with
CNTL/Z.
Ruijie(config)#vlan 1
Ruijie(config-vlan)#max-dynamic-mac-count 160
```

Â

ð ¾ Ô

ð Ô

¯ ╟ ╖ ↓ Â ╟ ˘
a ˘ ↓ ' Æ˘
≠ a Â a ѝ Â **show mac-addre ss-table static** ¾ ˘ **clear mac-address-ta ble static** ¾

ð Ô

Ю 00d0.f800.073c˘ VLAN 4
↓ ѝ ˘
gigabitethernet 1/1 Э'

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

ð ¾ Ô

¾	
show mac-address-table static	Â
clear mac-address-table static	Â

ð ↓ Ô

S8600

¸ MAC ѝ 16K

¸ MAC ѝ 1K

14.1.7 mac-address-table filtering

Â ¾ **no** Â

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

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

ð Ô

mac-address	Â
vlan *vlan-id*	VLAN ID˘ ¤ Â

ð Ô

Â

ð ¾ Ô

ð Ô

a ù Â **show mac-address-table filtering** ¾ Â

ð Ô

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

ð ¾Ô

¾

MAC ╖ ╟ ˘ ┘
a Trap Â ┘Л Ю ¾ **snmp-server enable traps mac-notification** MAC Trap ╖ Â

ð Ô

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

ð ¾ Ô

¾	
snmp-server enable traps	trap Â
show mac-address-table notification	MAC ╖ Â
snmp trap mac-notification	MAC ╖ Â

14.1.9 snmp trap mac-notification

MAC ╖ Â ¾ **no** ╖ Â

snmp trap mac-notification {**added** | **removed**}

no snmp trap mac-notification {**added** | **removed**}

ð Ô

added	╕ Â
removed	Â

ð Ô

╖ Â

ð ¾ Ô

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

ð ¾Ô

¾	
mac-address-table notification	MAC ¶ Â
show mac-address-table notification	MAC ¶ Â

14.1.10 address-bind ip-address

ip mac .

address-bind *ip-address mac-address*

no address-bind *ip-address*

ð Ô

˘ ʒ ˩ Â

ð Ô

Ю fa 0/1 ѝ

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

ð ʒ Ô

ˌ ʒ	ˌ
show address-bind uplink	ˌ

ð ˩ Ô

RGOS10.1 ЛЪЭ

14.1.13 address-bind ipv6-mode

ip IP

address-bind ipv6-mode compatible

address-bind ipv6-mode loose

ш

address-bind ipv6-mode strict

ð Ô

ð ʒ Ô

ð Ô

ш Â

ð Ô

ǂ ѝ' ˘ ˘ ш Ь ˘ ѝ ш
Â è ˘ Ю '

	Ipv4	IPV6

ш	˧ IPV4+MAC ˚ Â	a ipv6 ˆ ˜ Â
	˧ IPV4+MAC ˚ Â	IPV6 Â
	˧ IPV4+MAC ˚ Â	˧ MAC й MAC IPV6

ð Ô

˘ IP й 192.168.5.2 й 00d0.f822.33aa˘ IPV6 Â

```
Ruijie# configure t
Enter configuration commands, one per line.  End with
CNTL/Z.
Ruijie(config)# address-bind 00d0.f822.33aa ip
192.168.5.2
Ruijie(config)# address-bind ipv6-mode compatible
```

14.1.14 mac-manage-learning uniform

╟ MAC ˉ й uniform .

ð Ô

ð ʒ Ô

ð Ô

╟ MAC ˉ й uniform ˅ ˧ Л υ γ ' ˛ MAC ˉ ˘ ╟˘ ╟ MAC ˉ '

ð Ô

ð ʒ Ô

ʒ	
show mac-address-table mac-manage-learning	MAC ˉ

14.1.15 mac-manage-learning uniform learning-synchronization

uniform Ю╕ ╟ MAC ┘ .

no mac-manage-learning uniform learning-sychronization

ð Ô

ð ३ Ô

ð Ô

uniform Ю╕ ╟ MAC ┘ ┤Л▐ γ
' ┤Л▐ no ३ ┘ ╟ MAC ┘

ð Ô

ð ३Ô

३	
show mac-address-table mac-manage-learning	MAC ⌐

14.1.16 mac-manage-learning dispersive

╟ MAC ⌐ ╪ dispersive .

ð Ô

ð ३ Ô

ð Ô

╟ MAC ⌐ ╪ dispersive Л╕ ┤Л▐ ⌐
MAC '

ð Ô

ð ३ Ô

ð Ô

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

ð ¾Ô

¾	
show mac-address-table static	Â
show mac-address-table filtering	Â
show mac-address-table dynamic	╟ Â
show mac-address-table interface	Â
show mac-address-table vlan	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

╟ Â

show mac-address-table aging-time

ð ¾ Ô

ð Ô

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

ð ¾Ô

¾	
mac-address-table aging-time	╟ Â

14.2.3 show mac-address-table count

Â

show mac-address-table count

ð ¾ Ô

ð Ô

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

ð ¾Ô

¾	
show mac-address-table static	Â
show mac-address-table filtering	Â
show mac-address-table dynamic	╟ Â
show mac-address-table address	Â
show mac-address-table interface	Â
show mac-address-table vlan	VLAN Â

14.2.4 show mac-address-table dynamic

╟ Â

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

ð Ô

mac-addr	MAC Â
vlan-id	VLAN Â
interface-id	(˩ Л∪ AggregatePort)

ð Ô

ð ¾ Ô

ð Ô

```
Ruijie# show mac-address-table dynamic
Vlan    MAC Address      Type       Interface
----   ------------    ------   ------------------
1    0000.0000.0001     DYNAMIC  gigabitethernet 1/1
1    0001.960c.a740     DYNAMIC  gigabitethernet 1/1
1    0007.95c7.dff9     DYNAMIC  gigabitethernet 1/1
1    0007.95cf.eee0     DYNAMIC  gigabitethernet 1/1
1    0007.95cf.f41f     DYNAMIC  gigabitethernet 1/1
1    0009.b715.d400     DYNAMIC  gigabitethernet 1/1
1    0050.bade.63c4     DYNAMIC  gigabitethernet 1/1
```

ð ¾Ô

¾	
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*]

ð Ô

mac-addr	MAC Â
vlan-id	VLAN Â

ð ¾ Ô

ð Ô

```
Ruijie# show mac-address-table filtering
Vlan       MAC Address         Type    Interface
------  ------------------- -------- -----------
1     0000.2222.2222     FILTER Not available
```

ð ¾Ô

MAC 3

14.2.7 show mac-address-table notification

14.2.8 show mac-address-table static

Â

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

ð Ô

vlan-id	VLAN ID Â

3.3.3.4 00d0.f811.1117

ð ¾Ô

¾	
address-bind	Â

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

╟ MAC ⌐

ð ¾ Ô

ð Ô

ð Ô

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

ð ¾Ô

¾	
mac-manage-learing uniform	╟ MAC ⌐ й uniform
mac-manage-learning uniform learning-synchronization	╟ MAC ╟
mac-manage-learning dispersive	╟ MAC ⌐ й dispersive

15 DHCP Snooping

15.1 DHCP snooping

DHCP snooping Ю ֳ ЛъЮ '

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

15.1.1 ip dhcp snooping

DHCP Snooping ╖ ˘ Ю ֳ Â
ֳ no ˘ DHCP Snooping ╖ Â

[**no**] **ip dhcp snooping**

ð Ô

ð Ô

╖

ð ֳ Ô

ð Ô

DHCP Snooping ╖ Л˘ ┘Л **show ip dhcp snooping**
ֳ DHCP snooping ╖ Â

~

DHCP Snooping б Private VLAN ╖ a Â

ð Ô

Ю DHCP snooping ╖ '

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

ð ¯Ô

¯	
ip dhcp snooping	DHCP Snooping

15.1.3 ip dhcp snooping bootp-bind

DHCP Snooping Bootp ¶ ˘ ÞO
¯Â ¯ no ˘ DHCP snooping Bootp
¶ Â

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

ð Ô

ð Ô

¶

ð ¯ Ô

ð Ô

ÞO˘ DHCP Snooping ¶ Bootp Â ¶
Ù˘ DHCP Snooping ¶ Bootp Â Bootp
¶ Ù˘ DHCP Snooping Bootp ¶
Â

ð Ô

ÞO DHCP Snooping Bootp '

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

ð ¯Ô

¾	
show ip dhcp snooping	DHCP snooping

15.1.4 ip dhcp snooping verify mac-address

MAC ¶ ˘ ÞO ¾ Â
¾ no ˘ MAC ¶ Â

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

ð Ô

¶

ð ¾ Ô

Â

ð Ô

MAC ¶ ˘ DHCP CLIENT ˘
MAC DHCP CLIENT MAC ¿ Â
MAC ˘ Â

ð Ô

ÞO DHCP MAC '

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

ð ¾ Ô

¾	
show ip dhcp snooping	DHCP snooping

15.1.5 ip dhcp snooping information option

DHCP ╕ option82 ╖ ˘
ЮО ¾ Â ¾ no ˘ ╖ Â

[**no**] **ip dhcp snooping information option**

ð Ô

╖

ð ¾ Ô

ð Ô

¾˘ DHCP ╕ option82 ˘ DHCP
╘ option82 ¦ Â

ð Ô

ЮО DHCP ╕ option82 ╖ '

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

ð ¾ Ô

¾	
show ip dhcp snooping	DHCP snooping

15.1.6 ip dhcp snooping database write-delay

DHCP Snooping ╟ ľ
FLASH ╖ ˘ ЮО ¾ Â ¾ no
˘ FLASH ╖ Â

¸ **ip dhcp snooping database write-delay** *time*

¸ [**no**] **ip dhcp snooping database write-delay**

ð Ô

time ' ч DHCP snooping FLASH Â

ð Ô

ЮDHCP

[**no**] **ip dhcp snooping trust**

ð Ô

Ю˝ й UNTRUST

ð ֳ Ô

ð Ô

ֳ˘ DHCP Ь й TRUST Â
TRUST DHCP ˘ UNTRUST
DHCP Â

ð Ô

Ю **fastethernet** *0/1* й TRUST '

```
Ruijie# configure terminal
Ruijie(config)# interface fastEthernet 0/1
Ruijie(config-if)# ip dhcp snooping trust
Ruijie(config-if)# end
Ruijie# show ip dhcp snooping
Switch DHCP snooping status ' ENABLE
Verification of hwaddr field status ' DISABLE
DHCP snooping database write-delay time: 0 seconds
DHCP snooping option 82 status: ENABLE
DHCP snooping Support ijie(co
```

ð ʒ Ô

ð Ô

╗ DHCP Snooping ⁸ VLAN ˘ Â

ǂ Э˘ CPP[CPU Protect Protocol]╗ ÂCPP ˝
DHCP ⁸˘ CPP ″I DHCP
Snooping ⁸╗ Â CPP ǂ ˘ έ

┘Л **show ip dhcp snooping** ʒ˘ Э
⁸ Â

~

S86 a DHCP ⁸╗ Â

ð Ô

Ю 1 ⁸ й 100pps'

```
Ruijie# configure terminal
Ruijie(config)# interface fastEthernet 0/1
Ruijie(config-if)# ip 62ƺU 13ȣ( )ƫ/ȼ2_02ƺUf13ȣ4Dƫ1e8d81588 02ȣ(091
```

¸ **show ip dhcp snooping binding**

15.3.1 show ip dhcp snooping

DHCP Snooping ˘ Ю ३ Â

show ip dhcp snooping

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ð Ô

ð ३ Ô

ð Ô

३˘ ⊣ Л Ъ DHCP Snooping Â

ð Ô

Ю DHCP Snooping '

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

ð ३ Ô

३	
ip dhcp snooping	DHCP snooping
ip dhcp snooping verify mac-address	DHCP snooping mac
ip dhcp snooping write-delay	flash
Ip dhcp snooping information option	DHCP ╗ option82
ip dhcp snooping bootp-bind	DHCP Snooping Bootp ╗
ip dhcp snooping trust	и DHCP snooping trust

ð Ô

Ю DHCP snooping ╟ '

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

ð ¾ Ô

¾	
show ip dhcp snooping binding	DHCP snooping

15.4.2 debug ip dhcp snooping

Э DHCP Snooping ╖ ˘ Ю ¾ Â

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

ð Ô

ð ¾ Ô

ð Ô

¾˘ DHCP snooping ╖ Â

ð Ô

Ю DHCP snooping '

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

16 IGMP Snooping

16.1

IGMP Snooping profile ३ ३ Â

Profile ३ '

- **range**
- **deny**
- **permit**

३ '

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

16.1.1 ip igmp profile

IGMP profile 8 Â profile ˘ ˝I ЮO profile Â ३ ३˘ profile-numberˇ igmp profile Â

ip igmp profile *profile-number*

no ip igmp profile *profile-number*

ð Ô

profile-number	profile /ˇ 1-65535

ð Ô

Â

ð ֽ Ô

Â

ð Ô

IGMP Profiles Э ˇ ľ SVGL
Ŀ à ľ Ŀ à ľ IGMP Filtering Ŀ
╗ Â ˇ ѝ profile ˇ profile ╗
Â

ð Ô

Ю /ˀ ѝ 1 profile profile Â

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

ð ֽ Ô

ֽ	
range	profile

16.1.2 range

profile ˇ profile ˇ profile
Ю ֽ rangeˇ ┘Л ˇ ≠ ┘Л
Â ֽ no Â

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

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

ð Ô

low-ip-address	æ
high-ip-address	

ð Ô

Â

ð ¾ Ô

profile Â

ð Ô

low-ip-address high-ip-address ˘ Л˘
ий˘ profile и deny Â

ð Ô

Ю ий 233.3.3.3 234.4.4.4 profile :

```
Ruijie(config)# ip igmp profile 1
Ruijie(config-profile)# range 233.3.3.3 234.4.4.4
```

ð ¾ Ô

¾	
ip igmp profile	profile
deny	profile ий deny
permit	profile ий permit

16.1.3 deny

profile ˘ profile Ю ¾
deny Â

deny

ð Ô

Â

ð Ô

profile deny Â

ð ¾ Ô

profile Â

ð Ô

"I profile Ю range ¾ Â

ð Ô

Ю 233.3.3.3 profile :

16.1.5 ip igmp snooping ivgl

igmp snooping ivgl ˘ ֽ **ip igmp snooping ivgl** Â no ip igmp snooping igmp snooping Â

ip igmp snooping ivgl

no ip igmp snooping

ð Ô

Â

ð Ô

disable Â

ð ֽ Ô

Â

ð Ô

ЮЎ VLAN Â ў ˩ б ˩ VLAN ' VLAN ˘ ˩ ˩ VLAN Â

ð Ô

Ю Э igmp snooping ivgl '

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

ð ֽ Ô

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

16.1.6 ip igmp snooping svgl

igmp snooping SVGL ˘ ֽ **ip igmp snooping svgl** Â no ip igmp snooping igmp snooping Â

ip igmp snooping svgl

no ip igmp snooping

ð Ô

Â

ip igmp snooping ivgl-svgl

no ip igmp snooping

ð Ô

Â

ð Ô

disable Â

ð ৡ Ô

Â

ð Ô

˘ IVGL à SVGL ч Â IVGL SVGL ч
ل Л ل ˘ ل Л IGMP Profile ţ
SVGL˘ ˘ ل Л VLAN
˘ è
ل VLAN Â

&

ù IVGL# ˘ profile
VLAN

- Ò Ê

VLAN igmp snooping ˘

٦ **ip igmp snooping vlan** Â

num	╟ ˘ ↵ ѝ 1-3600˝ Æ ѝ Â

ð Ô

300s

ð ˛ Ô

Â

ð Ô

╟ è IGMP
PIM Hello ˘ ÿ Â

ð Ô

Ю ╟ ѝ 500s˝

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

ð ˛Ô

16.1.11 ip igmp snooping query-max-response-time

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

ip igmp snooping query-max-response-time *num*

no ip igmp snooping query-max-response-time

ð Ô

num	IGMP ˘ ↵ ѝ 1-65535˝ Æ ѝ Â

ð Ô

10s

ð ˛ Ô

Â

ð Ô

IGMP Л˘
˘ ѝ ˘ ѝ 0 ˘

ὺ a Ἀ ˘ γ ÿ IGMP Snooping Â

IGMP ʌ˘ ╟ ˘ ὺ ˘ ὺ 0 ˘ ὺ a Ἀ ˘ ÿ IGMP Snooping Â

IGMPv3 ˘ a Â

ð Ô

Ю IGMP ὺ 15s᾽

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

ð ʒ Ô

16.1.12 ip igmp snooping vlan mrouter learn pim-dvmrp

╟ IGMP Query à DVMRP Probe PIM ˘ Лυ ╟ ˘ ʒ **ip igmp snooping vlan mrouter learn pim-dvmrp** Â ʒ no ↓ ╟ Â

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

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

ð Ô

vid	VLAN ╟ IGMP Snooping ˘ ╖ ˘ ↓ ὺ VLAN ID

ð Ô

╖ Â

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б è Â

Ю˝ VLAN ╟ ˘ ↓ Лυ VLAN ╟ ˘ ╖ ˘ no ʒ ╟ ˘ ˘ ╟ ˘ Â ˘ ↓

ÿ ˘ Ą
' ÿ ѝ ˘ Â
Ш Ю ╠ ˘ ˘ ┘ Л igmp
snooping Â

ð Ô

Ю ╠ ˘ Ш '

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

ð Ô

ip igmp snooping vlan mrouter interface	

16.1.13 ip igmp snooping vlan mrouter interface

˘ **ip igmp snooping vlan mrouter interface** Â no Â

ip igmp snooping vlan *vid* **mrouter interface** *interface-id*

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

ð Ô

vid	vlan id
interface-id	

ð Ô

Â

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┘ Л Э ѝ ˘ ÿ Э
IP ┘ Л Â
Ю ┘ ÿ ˘ è Â

ð Ô

Ю '

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

ð ¢ Ô

¢	

16.1.14 ip igmp snooping vlan static interface

igmp snooping ЮЎ
Ў a ↓ IGMP report Â ¢
ip igmp snooping vlan static interface Â ¢ no
Â

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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Ю Э и vlan1 ЭЎ и 224.3.3.3

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

ð ¢ Ô QaadÂÂQ

ip igmp snooping vlan mrouter interface	

16.1.15 ip igmp snooping fast-leave enable

igmp snooping fast-leaveˇ ৡ **ip igmp snooping fast-leave enable**Â ৡ no igmp snoopin]TJEi[ip <1FF5747

IGMP SNOOPING ш IGMP Â
˘ ÿ ˘ ɣ
IGMP Sooping ЎĄ Э Â
IGMP SNOOPING ˘ ɲ ÿ
˘ ɣ ЎĄ ' ÿ
ѝ ˘ Â
˘ ˘ ˘
Â
ɲ˘ VLAN a ˘ ѫ
a Â

ð Ô

Ю igmp snooping ╖ Â

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

ð ֽ Ô

ֽ	
ip igmp snooping source-check default-server	IP ╖

16.1.18 ip igmp snooping source-check default-server

IP ⁸ ɲ IP Ŀ
Â igmp snooping IP ╖ ˘ ֽ
ip igmp snooping source-check default-server Â ֽ no
IP ╖ Â

ip igmp snooping source-check default-server *address*

no ip igmp snooping souce-check

ð Ô

address	ˆ Ŀ ˜ Â

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ÞO ╕ IP Â

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

ð ৡ Ô

ৡ	
ip igmp profile	profile

16.1.21 ip igmp snooping max-groups

╟ ╖ , ৡ **ip** ৡ ৡ ╟ 8

¸ **debug igmp-snp**

16.2.1 show ip igmp snooping

igmp snooping Â

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

ð Ô

	igmp snooping
gda-table	γ
interfaces	γ ЮÐ filter max-group
mrouter	
statistics	snooping

ð Ô

Â

ð ֿ Ô

EXEC Â

ð Ô

Â

ð Ô

ЮÐ fa0/1 Э ٧ 100 '

```
Ruijie(config-if)# ip igmp snooping gda-table
Abbr:M - mrouter
    D - dynamic
    S - static
VLAN    Address          Member ports
-------- --------       ----------------------------
1      233.3.3.3         Gi0/2(S)
2      234.4.4.4         Gi0/11(S)
1      233.4.4.4         Ag2(S)
```

ð ֿ Ô

16.2.2 show ip igmp profile

profile Â Ю ֳ'

show ip igmp profile

show ip igmp profile *profile-number*

ð Ô

	profile Â
profile-number	profile

ð Ô

Â

ð ֳ Ô

EXEC Â

ð Ô

profile ˘ ˩Л∪ ֳ Â

ð Ô

Ю fa0/1 Э ˅ 100 '

```
Ruijie(config-if)#show ip igmp profile
Profile    1
       Permit
       range 224.0.1.0,   239.255.255.255
```

ð ֳ Ô

16.2.3 clear ip igmp snooping gda-table

╟ ˉ Â

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ð Ô

Â

ð ¸ Ô

EXEC Â

ð Ô

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

ð ¸Ô

16.2.4 clear ip igmp snooping statistics

╟ ¯ Â

ð Ô

ð Ô

Â

ð ¸ Ô

EXEC Â

ð Ô

Â

ð Ô

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

ð ¸Ô

16.2.5 debug igmp-snp

igmp ╘ Â ¸ no Â

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

undebug igmp-snp event

undebug igmp-snp packet

undebug igmp-snp msf

undebug igmp-snp warning

ð Ô

	IGMP Snooping
event	IGMP Snooping Y¨
packet	IGMP Snooping
msf	IGMP Snooping б
warning	IGMP Snooping

ð Ô

Â

ð ¾ Ô

EXEC Â

ð Ô

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ð Ô

ð ¾Ô

17 PIM-Snooping

17.1 PIM-Snooping

PIM-Snooping ЛъЮ ¾'

- **ip pim snooping˜** ~
- **ip pim snooping˜** ~
- **show ip pim snooping**
- **show ip pim snooping vlan**

17.1.1 ip pim snooping

PIM-Snooping˜ **ip pim snooping** ¾ Â
¾ no PIM-Snooping Â

ip pim snooping

no ip pim snooping

ð Ô

¾ Â

ð Ô

PIM-Snooping Â

ð ¾ Ô

ð Ô

Ruijie# **configure terminal** Enter configuration commands, one per line. End with CNTL/Z.
Ruijie(config)# **ip pim snooping** 6(snooping))]TJ/C2_0 1 Tf0 Tc 7.726 0Tc

Э PIM-Snooping˘ **ip pim snooping** ¢ Â
¢ no Э PIM-Snooping Â

ip pim snooping

no ip pim snooping

ð Ô

¢ Â

ð Ô

Э PIM-Snooping Â

ð ¢ Ô

ð Ô

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

&

PIM-Snooping˘ æ VLAN Э PIM ╖
Â

ð ◢ Ô

¢ ◥ Э Â

17.1.3 show ip pim snooping

PIM-Snooping ˘ **show ip pim snooping**
¢ Â

show ip pim snooping

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ð ¢ Ô

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ЛЬЮ ¢ PIM-Snooping

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

ð ৶ Ô

ৡ ৸ Э Â

17.1.4 show ip pim snooping vlan

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

show ip pim snooping vlan *interface-number*

ð Ô

interface-number	VLAN ID

18 MSTP

18.1

18.1.1 spanning-tree

MSTP˘ ¬ MSTP ¬ ˘ MSTP
Â ¾ no spanning-tree ¶ ˘ no ¾
¬ ⁸ ˘ a spanning tree Â

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

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

ð Ô

forward-time *seconds* ' ¬ Â

hello-time *seconds* ' BPDU Â

max-age *seconds* ' BPDU Â

ð Ô

spanning-tree Â

ð ¾ Ô

Â

ð " Ï **forward-time**-**hello-time**

show spanning-tree STP Â

spanning-tree mst cost STP PathCost Â

spanning-tree tx-hold-count STP TxHoldCount Â

18.1.2 spanning-tree bpdufilter

BPDU filter Â ¼Ú ¾ enabled disabled BPDU filter Â

spanning-tree bpdufilter [**enabled** | **disabled**]

ð Ô

enabled ′ BPDU filter Â

Disabled ′ BPDU filter Â

ð Ô

Â

ð ¾ Ô

Â

ð Ô

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

ð ¾Ô

show spanning-tree interface STP Â

18.1.3 spanning-tree bpduguard

BPDU Guard Â ¼Ú ¾ enabled disabled BPDU Guard Â

spanning-tree bpduguard [**enabled** | **disabled**]

ð Ô

enabled ′ BPDU Guard Â

disabled ′ BPDU Guard Â

ð Ô

Â

ð ¾ Ô

Â

ð Ô

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

ð ৡ Ô

show spanning-tree interface STP Â

18.1.4 spanning-tree link-type

a “ ”Â ৲Л৬ ৡ no Â

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

no spanning-tree link-type

ð Ô

poinit-to-point ' 8 ѝ point-to-point.

Shared ′ 8 ѝ shared

ð Ô

ѝ ৲ ˘ ѝ point-to-poinť ѝ ৲ ѝ shared

ð ৡ Ô

Â

ð Ô

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

/ BA2O_

no spanning-tree max-hops

ð Ô

hop-count ' BPDU ৶ Л৬ ˘ ѝ 1˙ 40

ð Ô

hop-count ѝ 20

ð ৡ Ô

.

ð Ô

Region ˘ Root Bridge BPDU Hot Count ˘ ÿ Root Bridge ˘ ˘ Hop Count 1˘ ѝ 0 BPDU ˘ Hops ѝ 0 BPDU Â

৶ max-hops Instance Â

ð Ô

Ю MST Instance Max-hops ѝ 10˝

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

≠ ৶ Л৬ **show spanning-tree mst** ৡ Э

ð ৡ Ô

show spanning-tree MSTP Â

18.1.6 spanning-tree mode

Ю ৡ STP Â no ৶ Л৬ Â

spanning-tree mode [**stp** | **rstp** | **mst***p*]

no spanning-tree mode

ð Ô

stp ' Spanning tree protocol(IEEE 802.1d)

rstp ' Rapid spanning tree protocol(IEEE 802.1w)

mstp ' Multiple spanning tree protocol(IEEE 802.1s)

ð Ô

MSTP

ð ৡ Ô

.

ð Ô

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

ð ֽ Ô

show spanning-tree

18.1.7 spanning-tree mst configure

Ю ֽ ⊣ Л∪ MST ˘ MSTP Region Â
no ⊣ Л∪ ֽ Ю ^ name à revision à vlan map˜
Â

spanning-tree mst configuration

no spanning-tree mst configuration

ð Ô

instance vlan Vlan Instance 0 Â

name и Â

revision и 0 Â

ð ֽ Ô

.

ð Ô

˘ end ֽ˘ Ctrl+C Â

˘ exit ֽ Â

MST Л˘ ⊣ Л∪ Л∪Ю ֽ '

instance *instance-id* v**lan** *vlan-range*' Vlan ╗ MST Instance
Â instance-id и 0¨ 64 Âvlan и 1¨ 4095 Âvlan-range
⊣ Л∪ vlan ˘ VLAN ID Л ˘ VLAN ID ⊣ Л∪
ļ· Ľ ч VLAN ID ˘ ' instance 10 vlan 2,3,6-9
Ю VLAN 2˝ 3˝ 6˝ 7˝ 8˝ 9 ╗ Instance 10 Â
VLAN Instance 0 Â VLAN ÿ Instance
no ֽ' **no instance** *instance-id* [**vlan** *vlan-range*] Â(no
ֽ Instance и 1¨ 64)

name *name*' MST Л ˘ ⊣ Л∪ ⊣ Л∪ 32 Â ⊣ Л∪
no name è Â

revision *version* J

show MST region Â

ð Ô

ЮO MST ˘ VLAN 3, 5-10 MST Instance 1 Â

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

VLAN 3 ÿ Instance 1 ˘ æ MST ˅˘ ЮO

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

Instance 1 ˘ ЮO

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

˧˥ MST ֽ show Э Â

ð ֽ Ô

show spanning-tree mst ' MST region

instance instance-id vlan vlan-range ' Vlan ╗ MST Instance

name ' MST ˧

revision ' MST ˄

show ' MST ЮO MST

18.1.8 spanning-tree mst cost

ЮO ֽ Instance Â no ˧ ˥ ֽ Â

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

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

ð Ô

instance-id ' Instance Λ˘ ѝ 0¨ 64

cost ′ ˘ ѝ 1¨ 200¨ 000¨ 000

ð Ô

Instance-ID ѝ 0

ѝ Interface ╟ Â

• 1000 Mbps—20000

• 100 Mbps—200000

• 10 Mbps—2000000

ð ϧ Ô

.

ð Ô

cost

ð Ô

Instance 3 ѝ 400 Ю′

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

≠ ⅃Л **show spanning-tree mst interface interface-id** ϧ Э

ð ϧ Ô

show spanning-tree mst ' MSTP Â

spanning-tree mst port-priority ' ″I

spanning-tree mst priority ' ѝ instance ″I

18.1.9 spanning-tree mst port-priority

Ю ϧ ⅃Л a ⅄ Instance Л a ⅄ ″I ˘ Region Â no ⅃Л ϧ Â

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

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

ð Ô

Instance-id ' Instance ʌ˘ ѝ 0ˉ 64

priority ' ˝I ˘ ˩ 0˝ 16˝ 32˝ 48˝ 64˝ 80˝ 96˝ 112˝ 128˝ 144˝ 160˝ 176˝ 192˝ 208˝ 224˝ 240˝ 16 ˘ ѝ 16

ð Ô

Instance-id ѝ 0

priority ѝ 128

ð ৡ Ô

.

ð Ô

Region ˘ ˝I ˝I Â ˝I ˩ ˘ Л ʌ

ð Ô

Ю Instance 20 Gigabitethernet 1/1 ˝I ѝ 10˝

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

˩Л **Region[(sho)10(w) -1/TT6ng-tree mst**

priority ' ″I ˘ ⅃ 0, 4096,8192, 12288, 16384, 20480, 24576, 28672, 32768, 36864, 40960, 45056, 49152,53248, 57344 61440 Â 16 ˘ ѝ 4096

ð Ô

instance-id ѝ 0

priority ѝ 32768

ð ৡ Ô

.

ð Ô

Ю Instance 20 ″I ѝ 8192′

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

⅃Л **show spanning-tree mst instance interface interface-id** ৡ Э

ð ৡ Ô

show spanning-tree mst ' MSTP Â

spanning-tree mst cost '

spanning-tree mst port-priority ' a ⅃ Instance ″I

18.1.11 spanning-tree reset

spanning-tree ѝ Â ৡ no Â

spanning-tree reset

ð Ô

ৡ Â

ð ৡ Ô

Â

ð Ô

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

ð ৡ Ô

show spanning-tree ' STP Â

show spanning-tree interface ' STP Â

18.1.12 spanning-tree tx-hold-count

STP TxHoldCount ˘ BPDU Â
¾ no Â

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

no spanning-tree tx-hold-count

ð Ô

tx-hold-count ' TxHoldCount Â ÿ 1 10 Â

ð Ô

3 Â

ð ¾ Ô

Â

ð Ô

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

ð ¾ Ô

show spanning-tree ' MSTP Â

18.1.13 spanning-tree pathcost method

Â ¾ no
Â

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

no spanning-tree pathcost method

ð Ô

long ´ 802.1t path-cost Â

short ´ 802.1d path-cost Â

ð Ô

802.1T Path-cost Â

ð ¾ Ô

Â

ð Ô

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

ð ¾ Ô

show spanning-tree interface ' STP Â

18.1.14 spanning-tree portfast

Portfast Â ৲ Л৬ ৡ disabled
Portfast Â

spanning-tree portfast [**disabled**]

ð Ô

disabled Portfast Â

ð Ô

Â

ð ৡ Ô

Â

ð Ô

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

ð ৡ Ô

show spanning-tree interface ' STP Â

18.1.15 spanning-tree portfast bpduguard default

BPDU guard Â ৲ Л৬ ৡ no BPDU guard Â

spanning-tree portfast bpduguard default

no spanning-tree portfast bpduguard default

ð Ô

ৡ Â

ð Ô

BPDU Guard.

ð ৡ Ô

Â

ð Ô

BPDU guardƙ Э BPDUƙ error-disabled
Â **show spanning-tree** ৡ Â

ð Ô

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

ð ৡ Ô

show spanning-tree interface STP Â

18.1.16 spanning-tree portfast bpdufilter default

BPDU filter Â ⅃ Л ৡ no BPDU filter Â

spanning-tree portfast bpdufilter default

no spanning-tree portfast bpdufilter default

ð Ô

ৡ Â

ð Ô

BPDU filter

ð ৡ Ô

Â

ð Ô

BPDU Filter ⅄˘ a ≠ a BPDU Â **show spanning-tree** ৡ Â

ð Ô

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

ð ৡ Ô

show spanning-tree interface STP Â

18.1.17 spanning-tree portfast default

Portfast Â ৡ no Portfast Â

spanning-tree portfast default

no spanning-tree portfast default

ð Ô

ৡ Â

ð Ô

Portfast Â

ð ¾ Ô

Â

ð Ô

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

ð ¾Ô

show spanning-tree interface STP Â

18.1.18 spanning-tree tc- protection

tc- protection Â ¾ no tc-protection Â

spanning-tree tc- protection

no spanning-tree tc- protection

ð Ô

¾ Â

ð Ô

tc- protection Â

ð ¾ Ô

Â

ð Ô

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

18.1.19 spanning-tree tc-protection tc-guard

tc- guard Â ¾ no tc- guard Â tc-guard ¶ ˘ tc Â

spanning-tree tc-protection tc-guard

no spanning-tree tc-protection tc-guard

ð Ô

¾ Â

ð Ô

tc- guard Â

ð ¾ Ô

Â

ð Ô

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

18.1.20 spanning-tree tc-guard

tc- guard Â ¾ no tc- guard Â
tc-guard ¶ ˘ tc Â

spanning-tree tc-guard

no spanning-tree tc-guard

ð Ô

¾ Â

ð Ô

tc- guard Â

ð ¾ Ô

Â

ð Ô

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

18.1.21 spanning-tree guard root

root guard Â ¾ no root guard Â
root guard ¶ ˘
Æ ˩ Â

spanning-tree guard root

no spanning-tree guard root

ð Ô

¾ Â

ð Ô

root guard ¶ Â

ð ¾ Ô

ð Ô

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

18.1.24 spanning-tree guard none

Э guard Â ¾ no ¼ Э guard ¶ Â

spanning-tree guard none

no spanning-tree guard none

ð Ô

¾ Â

ð Ô

guard ¶ Â

ð ¾ Ô

Â

ð Ô

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

18.1.25 spanning-tree autoedge

Autoedge Â ¼Ú ¾ disabled
Autoedge Â

spanning-tree autoedge [**disabled**]

ð Ô

disabled Autoedge Â

ð Ô

Â

ð ¾ Ô

Â

ð Ô

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

ð ¾Ô

show spanning-tree interface ' STP Â

18.1.26 bpdu src-mac-check

bpdu mac Â ৸ Л৬ ৡ no
bpdu mac ╖ Â

bpdu src-mac-check *H.H.H*

no bpdu src-mac-check

ð Ô

H.H.H ৸ mac ৮ bpdu Â

no bpdu Â

ð Ô

Â

ð ৡ Ô

Â

ð Ô

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

ð ৡ Ô

18.1.27 clear spanning-tree detected-protocols

৪ RSTP BPDUʹ BPDU ৪ Â

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

ð Ô

interface-id

ð Ô

Â

ð ৡ Ô

ð Ô

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

ð ৡ Ô

show spanning-tree interface STP Â

18.1.28 spanning-tree compatible enable

MSTI ˘ Л

18.2

18.2.1 show spanning-tree

Â

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

ð Ô

summary ′ MSTP instance è Â
Inconsistentports ′ block Â
forward-time ′ BridgeForwardDelay Â
hello-time ' BridgeHelloTime Â
max-age ' BridgeMaxAge Â
max-hops ' instance Â
tx-hold-count ' TxHoldCount Â
pathcost method ′ Â

ð ¾ Ô

Â

ð Ô

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

ð ¾Ô

spanningtree pathcost method '
spanning-tree forward-time ' BridgeForwardDelay Â
spanning-tree hello-time ' BridgeHelloTime Â
spanning-tree max-age ' BridgeMaxAge Â
spanning-tree max-hops ' instance
spanning-tree tx-hold-count ' TxHoldCount Â

18.2.2 show spanning-tree interface

STP Â Ù Â

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

ð Ô

interface-id ' /ı

bpdufilter ' bpdufilter Â

portfast ' portfast Â

bpduguard ' bpduguard Â

link-type ' linktype

ð ¾ Ô

Â

ð Ô

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

ð ¾ Ô

spanning-tree bpdufilter ' BPDU filter Â

spanning-tree portfast ' portfast Â

spanning-tree bpduguard ' BPDU guard Â

spanning-tree link-type ' a “ ”Â

18.2.3 show spanning-tree mst

ÞO ¾ ⊣ Л∪ MST ˘ Instance Â

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

ð Ô

configuration ' mst

instance-id ' *Instance* /ı

interface-id ' /ı

ð Ô

Instance Â

ð ¾ Ô

.

ð Ô

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

ð ३ Ô

spanning-tree mst configuration ' MST region

spanning-tree mst cost ' instance

spanning-tree mst max-hops ' instance

spanning-tree mst priority ' instance ″I

spanning-tree mst port-priority ' instance ″I

19 SPAN

19.1 monitor session

SPAN ˆ ˜ ˆ ˜ .
ʒ no Â

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

session_number	SPAN /ı Â
source interface *interface-id*	Â interface-idʻ /ı˘ ˩ Л ѝ ˘ a ˩ Л ѝ SVIʻ S8600 ≠ ˩ AP
destination interface *interface-id*	Â interface-idʻ /ı˘ ˩ Л ѝ ˘ a ˩ Л ѝ SVIʻ S8600 ≠ ˩ AP Â
both **acl** *name*	˩ Â **acl** *name/id*
rx	˩ Â
tx	˩ Â
all	
switch	ℸ ˘ ѝ a

ð ʒ Ô

ð Ô

switch port routed port ˩ Л ѝ Â SPAN
a Â˩ Л SPAN disabled port
Э˘ ˘ SPAN a Э Â

ð ¾ Ô

ð Ô

ð Ô

ÞÔ **show monitor** ¾ SPAN 1

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

ð ¾Ô

¾	
monitor session	SPAN ^ ~ ^ ~ Â

20 RSPAN

20.1

20.1.1 monitor session

¾ RSPAN Â

'

monitor session *session_num* {**remote-destination** | **remote-source**}

'

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

'

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

ð Ô

session-num	/\
vlan-id	**remote span vlan id**
Interface-id	/\

ð ¾ Ô

ð Ô

˘ **end** ¾˘ Ctrl+C Â

˘ **exit** ¾

ð Ô

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

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

ð ¾Ô

¾	
show monitor	Â

20.1.2 remote-span

¾ **RSPAN VLAN**

[**no**] **remote-span**

ð Ô

ð ¾ Ô

Vlan

ð Ô

˘ **end** ¾˘ Ctrl+C Â

˘ **exit** ¾

ð Ô

Ruijie(config)# **vlan** *5*
Ruijie(config-vlan)# **remote-span**

ð ¾Ô

¾	
show vlan	Vlan Â

21 IP

21.1

ЛЪЮ ֽ'

- **ip address**
- **ip unnumbered**

21.1.1 ip address

ֽ IP ˇ ↓Л Ъ no IP Â
ֽ Ю'

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

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

ð Ô

ip-address	32 Æ IP ˇ 8 Æ ˇ Л Ъ 8 ˇ Â
network-mask	32 Æ ˇ “1” Æˇ “0” ў Æ Â 8 Æ ˇ Л Ъ 8 ˇ Â
secondary	IP Â

ð Ô

IP Â

ð ֽ Ô

ǂ ˘ ǂ ў ǂ Æ ≠
ѝ ǂ ˘ ў ˘ ╗ ˘ ѝ
Â

RGOS ˚ ⅃Л IP ˘ ѐ ѝ ў IP ˘
ѐ ѝ IP Â IP Э ⁸˘ ⅃Л
˘ ⅄ ⅄ ў IP ⅄ IP Â IP ⅃Л б
ў IP ⅃ a ⅃ Â ˘ IP
˘ ЛЮ Ю IP '

ˌ ў Â C
˘ ⅃ǂ 254 ⅄ ў Â ў 254 ⅄ ˘ C
a ǂ ˘ ǂ ⅄ C Â
ч ˘ Л IP Â

ˌ γ ˘ ǂ Â IP
⅃Л ˘ IP Â
˘ IP Â

ˌ ч ⅄ ˘ ⅃Л
˘ IP ˘ Â
a ч ч ЛЭ Â

ð Ô

ЛЮ ˘ ў IP ѝ 10.10.10.1˘ ѝ
255.255.255.0 Â

```
ip address 10.10.10.1 255.255.255.0
```

ð ȝ Ô

ȝ	
show interface	

21.1.2 ip unnumbered

ȝ ⁄⁄ ˘ ѝ ⁄⁄ ⁄˘
Э IP ˘ ⅃Л IP Â ⅃Л no ⅄
Â

ip unnumbered *interface-type interface-number*

no ip unnumbered *interface-type interface-number*

ð Ô

interface-type	

interface-number	∧

ð Ô

ЮЎ ∧ Â

ð ३ Ô

ð Ô

∧ ↵ ╟ IP ˘ a† IP ˘ ∧
έ IP Â ∧ IP ˘
IP ѝ IP Â↑ ≠
IP ˘ ¤ ∧ Â ∧ ˘
ЛЮ ⁸'

¸ Л∪ a ∧ Â

¸ SLIP à HDLC à PPP à LAPB à Frame-relay ˘ ↵ Л∪
∧ Â ˘ ↵
∧ Â X.25 a ∧ Â

¸ a ping ३ ∧ ˘ ѝ ∧
IP Â SNMP ↵ Л∪ ∧ Â

¸ a ∧ ╟ Â

ð Ô

ЛЮ ˘ ѝ ∧ ˘ ѝ FastEthernet 0/1 Â
IP Â

```
ip unnumbered fastEthernet 0/1
```

ð ३ Ô

३	
show interface	

21.2

३ '

¸ **arp**

¸ **arp retry interval**

¸ **arp retry times**

¸ **arp trusted num**

¸ **arp trusted aging**

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

21.2.1 arp

३ ˇ ⊣ ⅄ ARP ă ╗ IP MAC
Â ३ no ⊣ ⅄ MAC Â

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

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

ð Ô

३	

clear arp-cache n

ʒ˘ ˩Л arp ˘ ˩ IP
˘ ARP Â ʒ no ˩Л
5 ARP Â

arp retry times *number*

no arp retry times

ð Ô

number	˩ ARP ˘ <1-100> Â ѝ 1 ˘ a ARP ˘ ˩ 1 ARP

ð Ô

ARP ˘ ARP 5 ˘ ˥ Â

ð ʒ Ô

ARP

V p " u Ý

ð Ô

number	¬Л Ъ ¬ ARP , ¬ <10-4096> Â

ð Ô

a ¬ a ¬ Â

ð ¾ Ô

ð Ô

¾ ˘ ¨I ¬ ARP ╖ Â ¬ ARP è ˘ ¬ ´ ˘ ¬ ╟ ARP a Â ˘ a Â

ð Ô

ЛЪЮ ˘ ¬Л Ъ 1000 ¬ ARP Â

```
arp trusted 1000
```

ð ¾ Ô

¾	
service trustedarp	¬ ARP ╖

21.2.5 arp trusted aging

¾˘ ¬Л Ъ ¬ ARP Â ¾ no Â

arp trusted aging

no arp trusted aging

ð Ô

ð Ô

GSN ¬ ARP a Â

ð ¾ Ô

ð Ô

ʒ ʌ ɻ ARP ˘ ╟ ARP ɻ Â
ɻ Л∪ Ю **arp timeout** ʒ Â

ð Ô

Â

ð ʒ Ô

ʒ	
service trustedarp	ɻ ARP ╖

21.2.6 arp unresolve

ʒ˘ ɻ Л∪ ARP Â ʒ no
ɻ Л∪ 8192 Â

arp unresolve *number*

no arp unresolve

ð Ô

number	ARP ˘ ɻ й < 1-8192 > Â й 8192

ð Ô

ARP ă ɻ Л∪ 8192 Â

ð ʒ Ô

ð Ô

ARP ˘ з ʌ
˘ ɻ Л∪ ʒ ⁸ Â

ð Ô

ЛЮ ˘ й 500 Â

```
arp unresolved 500
```

ð ʒ Ô

21.2.7 arp gratuitous-send interval

ʒ˘ ˩ Л∪ arp Â ʒ no
Э ℸ

arp gratuitous-send interval *seconds*

no arp gratuitous-send

ð Ô

seconds	ARP ˘ Æ ˘ ˩ <1-3600> Â

ð Ô

ARP ℸ Â

ð ʒ Ô

ð Ô

й Ю ˘ Ю Ї
й˘ ˩ Л∪ ARP ˘ Ґ
Â

ð Ô

ЛυЮ ˘ SVI 1 ARP Â

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

ЛυЮ ˘ SVI 1 ARP

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

ð ʒ Ô

21.2.8 arp timeout

ARP ă ш ARP ˘ ˩ Л∪ ʒ Â
ʒ no ˩ Л∪ Â

arp timeout *seconds*

no arp timeout

ð Ô

seconds	˘ Л υ ѝ Æ˘ 0-2147483

ð Ô

ѝ 3600 Â

ð ϟ Ô

ð Ô

ARP ѵ ╟ ˜ IP MAC Â
˘ ARP ă ˘ ARP
≠ ˘ Л υ Â ˘ a
ARP Â

ð Ô

ЛЮ ˘ ÿ Л υ FastEthernet 0/1 ╟ ARP
ѝ 120 Â

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

ð ϟ Ô

ϟ	
clear arp-cache	ARP ă
show interface	

21.2.9 ip proxy-arp

Э ϟ ARP ╖ ˘ ѵ Л υ

⅋ ARP ╖ ⅃Л ╟ ў ˘ è
IP MAC Â ARP ˘ ARP
IP б IP a ⅄ ˘ IP
˘ ARP ˘ MAC и
Л MAC Â Л Э ⅋ ARP ╖ Â

ð Ô

ЛЮ ˘ Л FastEthernet 0 ⅋ ARP ╖ Â

```
interface fastEthernet 0
ip proxy-arp
```

21.2.10 service trustedarp

⅄ ARP ╖ ˘ ⅃Л **service trustedarp** ⅋ Â ⅋
no ⅄ ARP ╖ Â

service trustedarp

no service trustedarp

ð Ô

⅄ ARP Â

ð ⅋ Ô

ð Ô

⅄ ARP ╖ ARP ╖ ˘ и GSN
╎ ˘ GSN Â

ЛЮЬ ˘ STP ╟ MAC ˘ ≠ ⅄
Э ⅄ ˘ ⅄ MAC ⅄ ARP Â

1) STP

2) ⅄ root port ≠ design , ⅄ ⅄
updown ˘ ″I

3) tc ˘

ð Ô

ЛЮ ˘ Ю˘ service trustedarp ╖ Â

```
config
service trustedarp
```

21.3

б ʒ '

¸ **ip broadcast-addresss**

¸ **ip directed-broadcast**

21.3.1 ip broadcast-addresss

Ня ˘ ʒ **ip broadcast-addresss** Â
ʒ no ˩ Л∪ ˩ Â

ip broadcast-addresss *ip-address*

no ip broadcast-addresss *ip-address*

ð Ô

ip-address	IP

ð Ô

IP й 255.255.255.255 Â

ð ʒ Ô

ð Ô

IP й Ґ 1 Ŀ˘ й 255.255.255.255 Â
RGOS ˚ ˩ Л∪ Ня è IP ˘ з ˩ Л∪ ˩
Ґ 1 Ŀ Л∪ Ня Â

ð Ô

ЛЬЮ ˘ IP й 0.0.0.0 Â

```
ip broadcast-address  0.0.0.0
```

21.3.2 ip directed-broadcast

IP ˘ ʒ **ip**
directed-broadcast Â ʒ no ˩ Â

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

no ip directed-broadcast

ð Ô

access-list-number	ˆ ˩ ˜ ʌ˘ ÿ 1-199˝ 1300 - 2699 Â ʜ ʌ˘ ˩ ˥ IP Â

ð Ô

Â

ð ֽ Ô

ð Ô

IP й IP IP ˘
й 172.16.16.255 й Â
a Â

б IP ˘
Â ʌ˘
й ˆ IP й Ľ 1 Ł
˜ ˘ ʌ Л Э ў Â

˩ Л Э˘ ╟ ˘
˩ Л Â ֽ ˩
ʌ ˘ a è Â

Э˘ ˩ Л ʜ ⁸ Â ʜ
˘ ˩ ʜ
Â

Э **no ip directed-broadcast** ˘ RGOS
Â

ð Ô

ЛЬЮ ˘ FastEthernet 0/1 Â

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

21.4 IP

б IP ֽ '

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

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

21.4.1 clear arp-cache

ÿ ARP ă ╠ ARP ˘ Л IP ă ˘
ֽ clear arp-cache Â

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

ð ֽ Ô

ð Ô

Л Л ֽ 9 ARP Â

~

NFPP(Network Foundation Protection Policy,)
Э˘ mac (IP) Л ARP ˘ ч
clear arp 1s ˘ Л γ
ARP a Â

ð Ô

ЛЮ ˘ ARP ╠ ă Â

```
clear arp-cache
```

ЛЮ ˘ ╠ ARP 1.1.1.1

```
clear arp-cache 1.1.1.1
```

ЛЮ ˘ SVI1 Ю ╠ ARP

```
clear arp-cache interface Vlan 1
```

ð ֽ Ô

ֽ	
arp	ARP ╗ Â

21.4.2 show arp

ˆ ARP˜ ă

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

ð Ô

ip	ip ˘ ip ARP
ip mask	ip mask ARP
mac-address	mac ARP
static	arp
complete	╟ arp
incomplete	╟ arp

ð ȝ Ô

ð Ô

ЛЬЮ ѝ show arp ˈ

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

ARP ă ЬЖ ЮЎ

Protocol	˘ ѝ Internet Â
Address	б ˚ IP Â

ARP ă ˘ Ʌ¦ Â
Age (min)
Đ

ð ʒ Ô

ð Ô

ЛЬЮ ѝ **show arp counter** '

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

21.4.4 show arp detail

ARP Â ⌟ Л Ю ʒ '

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*]]

interface-type interface-number	Ь γ ARP
vrf *vrfname*	
ip	ip ˘ ip ARP
ip mask	ip mask ARP
mac-address	mac ARP
static	arp
complete	╟ arp
incomplete	╟ arp
trusted	⌟ ARP

ʒ

ARP ˘ ARP ˆ ╟ à à à ⌟ ˜ à γ ˘ ⌟ Л Ю ʒ Â

ЛЬЮ ѝ **show arp detail** '

```
Ruijie# show arp detail
```

IP Address	MAC Address	Type	Age(min)	Interface	Port
20.1.1.1	000f.e200.0001	Static	--	--	--
20.1.1.1	000f.e200.0001	Static	--	Vl3	--
20.1.1.1	000f.e200.0001	Static	--	Vl3	Gi2/0/1
193.1.1.70	00e0.fe50.6503	Dynamic	1	Vl3	Gi2/0/1
192.168.0.1	0012.a990.2241	Dynamic	10	Gi2/0/3	Gi2/0/3
192.168.0.1	0012.a990.2241	Dynamic	20	Ag1	Ag1
192.168.0.1	0012.a990.2241	Dynamic	30	Vl2	Ag2
192.168.0.39	0012.a990.2241	Local	--	Vl3	--
192.168.0.39	0012.a990.2241	Local	--	Gi2/0/3	--
192.168.0.1	0012.a990.2241	Local	--	Vl3	--
192.168.0.1	0012.a990.2241	Local	--	Gi2/3/2	--

ARP ă Ю

IP Address	б IP Â
MAC Address	б IP Â
Type	ARP à ╟ à ┘ à Â
Age	ARP æ¦ Â
Interface	б IP Ь Â
Port	б ARP γ Â

ʒ	
-	-

ʒ Ь Э a Â

ʌ	

ʒ ʌ

10.3(5)

21.4.5 show arp timeout

╟ ARP

show arp timeout

ð Ô

ð ȝ Ô

ð Ô

ЛЬЮ ѝ **show arp timeout** '

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

ARP ă ҤҠ ЮЎ

21.4.6 clear ip route

IP IP ˇ ┘Л

clear ip route ȝ Â

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

ð Ô

*	
network	
netmask	ˆ ┘ ~

ð ȝ Ô

ð Ô

ˇ ┘Л 9 Â
ˇ Â

ð Ô

ЛЬЮ ˘ ˬ 192.168.12.0 Â

```
clear ip route 192.168.12.0
```

ð ȝ Ô

ȝ	
show ip route	IP

21.4.7 show ip arp

ˆ ARP˜ ă ˘ ȝ Â

show ip arp

ð Ô

ð ȝ Ô

ð Ô

ЛЬЮ ỳ **show ip arp** '

```
Ruijie# show ip arp
Protocol Address      Age(min)Hardware       Type
Interface
Internet 192.168.7.233  23      0007.e9d9.0488  ARPA
FastEthernet 0/0
Internet 192.168.7.112  10      0050.eb08.6617  ARPA
FastEthernet 0/0
Internet 192.168.7.79   12      00d0.f808.3d5c  ARPA
FastEthernet 0/0
Internet 192.168.7.1    50      00d0.f84e.1c7f  ARPA
FastEthernet 0/0
Internet 192.168.7.215  36      00d0.f80d.1090  ARPA
FastEthernet 0/0
Internet 192.168.7.127  0       0060.97bd.ebee  ARPA
FastEthernet 0/0
Internet 192.168.7.195  57      0060.97bd.ef2d  ARPA
FastEthernet 0/0
Internet 192.168.7.183  --      00d0.f8fb.108b  ARPA
FastEthernet 0/0
```

ARP ă Ⱨ Ю'

Protocol	˘ й Internet Â
Address	б ˚ IP Â
Age (min)	ARP ă ˘ Л¦ Â ˘ “-” Â
Hardware	б IP ˚ Â

Type sh˘ow ip i<01făc0D403E2>Tj/T1f0 1 Tf0.0022 IP

22 IP

22.1 IP

IP ┗ ⅋ ЛЬЮ ⅋'

- **ip mask-reply**
- **ip mtu**
- **ip redirects**
- **ip source-route**
- **ip unreachables**

22.1.1 ip mask-reply

RGOS ˚ ICMP ˘ ICMP ˘ ⅋ **ip mask-reply** Â ⅋ no ICMP Â

ip mask-reply

no ip mask-reply

ð Ô

ICMP Â

ð ⅋ Ô

ð Ô

Э ˘ ѝ ↓ ˘ ↓Л ICMP ˘ ICMP Â

ð Ô

ЛЬЮ ˘ FastEthernet 0/1 ICMP Â

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

22.1.2 ip mtu

IP ˆ MTU˜ ˇ ٶ **ip mtu** Â ٶ no ٸ Л Â

ip mtu *bytes*

no ip mtu

ð Ô

bytes	IP ˇ Л й Æˇ 68~1500 Â

ð Ô

б ٶ mtu ٸ Â

ð ٶ Ô

ð Ô

IP IP MTU ˇ RGOS ˙ ٭ Â ٸ Э ˇ è IP MTU Â

ٶ mtu ˇ IP MTU ╟ б MTU Â ٶ ˇ IP MTU ˇ MTU a ٸ Â

ð Ô

ЛЮ ˇ FastEthernet 0/1 IP MTU й 512 Â

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

ð ٶ Ô

Â

ð ÔÔ

ð ÔÔ

a ˘ ˩ ÿ ˘ ÿ
Â ÿ ˘
ICMP ˘ и
˩ Э ˥ ˥ Â ˥
Â

RGOS ˚ ICMP Â

ð ÔÔ

ЛЬЮ ˘ FastEthernet 0/1 ICMP Â

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

22.1.4 ip source-route

RGOS ˚ IP ˘ **ip source-route** Â no Â

ip source-route

no ip source-route

ð ÔÔ

Â

ð ÔÔ

ð ÔÔ

RGOS IP Â IP ˘ IP ш
à à ˘ RFC 791
Â ε ˘
╠ ' ˘ ICMP
˘ ˥ Â

RGOS ˚ Ю IP Â

ð ÔÔ

ЛЬЮ ˘ IP Â

```
no ip source-route
```

22.1.5 ip unreachables

RGOS ˚ ICMP a ┘ ˘ ३ **ip unreachables** Â ३ no ┘Л℧ ICMP a ┘ Â

ip unreachables

no ip unreachables

ð Ô

Â

ð ३ Ô

ð Ô

RGOS ˚ ѝ ˘ a Э ˘ ICMP a ┘ Â

RGOS ˚ ˘ a ˘ ICMP ў a ┘ Â

३ ICMP a ┘ Â

ð Ô

ЛЬЮ ˘ FastEthernet 0/1 ICMP a ┘ Â

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

23 DHCP

23.1 DHCP

DHCP ЛЬЮ ३'

- **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**
- **networkˆ DHCP˜**
- **next-server**
- **option**
- **service dhcp**

23.1.1 bootfile

Ⱶ DHCP ╟ ˚ ɻ˘ DHCP ३
bootfile Â ३ **no** ↓Лυ↓ Ⱶ Â

bootfile *file-name*

no bootfile

ð Ô

file-name	ᏼ ╟ ˚ ﻉ Â

ð Ô

ᏼ ╟ ˚ ﻉ Â

ð ঳ Ô

DHCP

ð Ô

DHCP ╟ Ю à ˚ ˘ DHCP
Ŀ ╟ ˚ ﻉ˘ DHCP ﻝ Ո
Ŀ ˆ TFTP˜ Ю ˚ Â è Ŀ **next-server** ঳
ᏼ Â

ð Ô

ՈЮ ˘ ᏼ router.conf ѝ ╟ ˚ ﻉ Â

```
bootfile router.conf
```

ð ঳ Ô

঳	
ip dhcp pool	ᏼ DHCP ﻉ ˘ DHCP Â
next-server	DHCP ╟ Ю Ŀ IP Â

23.1.2 client-identifier

ᏼ DHCP ˆ Ո Ὼ ⁸ ˜˜ DHCP ঳ **client-identifier** Â ঳ **no** ﻝ Ո Â

client-identifier *unique-identifier*

no client-identifier

ð Ô

unique-identifier	DHCP ˘ Ո Ὼ ⁸ Â 0100.d0f8.2233.b467.6967.6162.6974.4574.6865.726e.6574.302f.31 Â

ð Ô

Â

ð ٪ Ô

DHCP

ð Ô

DHCP DHCP Ł ٭ IP ˘
˚ ٪ Â à MAC
ﻝ ˘ MAC ﻭ 00d0.f822.33b4 à ﻝ ﻭ GigabitEthernet 0/1 ﻭ
0100.d0f8.2233.b467.6967.6162.6974.4574.6865.726e.6574.302f.31˘
è 01 ٪ Ո ˘
67.6967.6162.6974.4574.6865.726e.6574.302f.31 ﻭ
GigabitEthernet0/1 Ω ⁸ Â ٪ ﻬ˘ ﻝ Ո
RFC1700 ľ Address Resolution Protocol Parameters Ł Â

ﻝ DHCP ﻬ ˘ ﻝ Ո ٪ Â

ð Ô

ՈЮ ˘ ﻬ MAC ﻭ 00d0.f822.33b4 Ո DHCP
Â

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

ð ٪ Ô

٪	
hardware-address	ﻬ DHCP ˚ Â
host	ﻬ IP Â DHCP Â
ip dhcp pool	ﻬ DHCP ﻝ ˘ DHCP Â

Ы Â

ð ¾ Ô

DHCP

ð Ô

Ю DHCP ÿ DHCP Ь Â
DHCP Ь й IP ˘ б¶
Л Â

ð Ô

ЛЮ ˘ Ы 192.168.12.1 й Â

```
default-router 192.168.12.1
```

ð ¾Ô

¾	
ip dhcp pool	Ы DHCP Л ˘ DHCP Â

23.1.5 dns-server

Ы DHCP DNS Ь ˘ DHCP ¾
dns-server Â ¾ **no** Л DNS Ь Ы Â

dns-server { *ip-address* [*ip-address2…ip-address8*] |
use-dhcp-client *interface-type interface-number* }

no dns-server

ð Ô

ip-address	Ы DNS Ь IP Â Â
ip-address2…ip-address8	ˆ Л ~ Л 8 DNS Ь Â
use-dhcp-client *interface-type interface-number*	RGOS ˚ DHCP DNS Ь ˘ й DHCP DNS Ь Â

ð Ô

Ы DNS Ь Â

ð ¾ Ô

DHCP

ð Ô

Ы DNS Ь ˘ ″I ˘ DHCP ↓ б
DNS Ь ˘ Ю DNS Ь Â

RGOS ˚ ↓ ≠ DHCP ˘ ↓Л DNS
Ь ˘ DHCP Â

ð Ô

ЛЮ ˘ й DHCP DNS Ь 192.168.12.3 Â

```
dns-server 192.168.12.3
```

ð ¾ Ô

¾	
domain-name	Ы DHCP Л ↓ Â
ip address dhcp	DHCP ↓ IP Â
ip dhcp pool	Ы DHCP ↓ ˘ DHCP Â

23.1.6 domain-name

Ы DHCP Л ↓˘ DHCP ¾ **domain-name** Â
¾ **no** ↓Л Л ↓ Â

domain-name *domain-name*

no domain-name

ð Ô

domain-name	Ы DHCP Л ↓ Â

ð Ô

Л ↓ Â

ð ¾ Ô

DHCP

ð Ô

DHCP Л ↓ Л˘ έ ↓ Л ↓ ў
˘ ў ↓ ↓Л Â

ð Ô

ЛЬЮ ˘ DHCP Ы Л Л i-net.com.cn Â

```
domain-name i-net.com.cn
```

ð ¾ Ô

¾	
dns-server	Ы DHCP DNS Ł
ip dhcp pool	Ы DHCP Л ˘ DHCP Â

23.1.7 hardware-address

Ы DHCP ˚ ˘ DHCP

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

ð ৡ Ô

ৡ	
client-identifier	⊮ DHCP ˆ Л Ώ ⁸ ~ Â
host	⊮ IP Â DHCP Â
ip dhcp pool	⊮ DHCP ˬ ˇ DHCP Â

23.1.8 host

⊮ DHCP ў IP ˇ DHCP ৡ **host** Â ৡ **no** ˪ Л DHCP IP ⊮ Â

host *ip-address* [*netmask*]

no host

ð Ô

ip-address	⊮ DHCP ў IP Â
netmask	⊮ DHCP ў Â

ð Ô

⊮ ў IP Â

ð ৡ Ô

DHCP

ð Ô

⊮ DHCP Ł IP Â A й 255.0.0.0 B й 255.255.0 C й 255.255.255.0 Â

˪ DHCP ⊮ ˇ ˪ Л ৡ Â

ð Ô

ЛЮ ˇ IP й 192.168.12.91 ˇ й 255.255.255.240 Â

```
host 192.168.12.91 255.255.255.240
```

ð ¾Ô

¾	
client-identifier	ĺ DHCP ˆ Ո Ω 8 ~ Â
hardware-address	ĺ DHCP ˚ Â
ip dhcp pool	ĺ DHCP ˇ DHCP Â

DHCP

23.1.10 ip dhcp excluded-address

ЮЖ IP ˘ DHCP Ь a è¦ DHCP ˘
ֽ **ip dhcp excluded-address** Â ֽ **no** ٦ Л٥ ٦
ЮЖ Â

ip dhcp excluded-address *low-ip-address* [*high-ip-address*]

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

ð Ô

low-ip-address	IP ˘ IP IP Â
high-ip-address	IP Â

ð Ô

DHCP Ь ¦ IP Â

ð ֽ Ô

ð Ô

IP ˘ DHCP Ь ¦ DHCP
IP Â ֽ ٦ Л٥ й ў IP ˘
¦ DHCP Â ЮЖ IP ˘ ≠ ٦ Л٥ DHCP
Ь ¦ ă Â

ð Ô

Л٥Ю ˘ DHCP Ь a ¦ 192.168.12.100~150
IP Â

```
ip dhcp excluded-address 192.168.12.100 192.168.12.150
```

ð ֽ Ô

ֽ	
ip dhcp pool	ЮЖ DHCP ٩ ˘ DHCP Â
networkˆ DHCP˜	ЮЖ DHCP /١ Â

23.1.11 ip dhcp ping packet

DHCP Ł ă ˘ ping ˘
ϡ **ip dhcp ping packet** Â ϡ **no** Â

ip dhcp ping packet [*number*]

no ip dhcp ping packet

ð Ô

number	ˆ ˩ ˜ ÿ 0 10˝ 0 ping Â ping ч Â

ð Ô

ping й 2 Â

ð ϡ Ô

ð Ô

DHCP Ł ÿ DHCP ϯ IP ˘ ping
è ў ´ ˘ ´ Ю ˘ ´
ϯ DHCP Â Ping й ч ˘ ˩Л
10 Â

ð Ô

ЛЮ ˘ ping й 3 Â

```
ip dhcp ping packets 3
```

ð ϡ Ô

ϡ	
clear ip dhcp conflict	DHCP ˩ ă Â

ip dhcp ping timeout *milli-seconds*

no ip dhcp ping timeout

ð Ô

milli-seconds	DHCP Ł ping ˆ Ո ˜ Â ɻ ϰ 100 10000 Â

ð Ô

ϰ 500 Â

ð ֽ Ô

ð Ô

Ⱶ ping Â

ð Ô

ՈЮ ˇ ping ϰ 600ms Â

```
ip dhcp ping timeout 600
```

ð ֽ Ô

ֽ	
clear ip dhcp conflict	DHCP ɻ ă Â
ip dhcp ping packets	Ⱶ DHCP Ł ˚ ˇ ă ping Â
show ip dhcp conflict	DHCP Ł ˚ ˇ ă Â

23.1.13 ip dhcp pool

Ⱶ DHCP ɻ DHCP ˇ
ֽ **ip dhcp pool** Â ֽ **no** ɻՈ DHCP Â

ip dhcp pool *pool-name*

no ip dhcp pool *pool-name*

ð Ô

pool-name	ɻՈ Â mypoolʹ 1 Â

ð Ô

ĺ DHCP Â

ð ¾ Ô

ð Ô

¾˘ DHCP ˘ ŕ'

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

˘ ˩Л IP à DNS ┗ à

Â

ð Ô

ЛЬЮ ˘ ĺ ˩ ŕ mypool0 DHCP Â

```
ip dhcp pool mypool0
```

ð ¾Ô

¾	
host	ĺ IP Â DHCP Â
ip dhcp excluded-address	ĺ DHCP ┗ a ↑ IP
networkˆ DHCP˜	ĺ DHCP /|

23.1.14 lease

ĺ DHCP ┗ ↑ ↄ DHCP ¾ **lease** Â ¾ **no** Â

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

no lease

ð

days	ĺ ˘ Л ŕ Æ Â
hours	ˆ ˩ ˜ ĺ ˘ Л ŕ Æ Â ĺ ĺ Â
minutes	ˆ ˩ ˜ ĺ ˘ Л↑ ŕ Æ Â ĺ↑ ĺ ų Â

infinite

ð Ô

ѝ Â

ð ȝ Ô

DHCP

ð Ô

ˇ DHCP Â DHCP Ŀ

ˇ a ˩ Â

ð Ô

ЛЬЮ ˇ DHCP ѝ 1 Â

```
lease 0 1
```

ЛЬЮ ˇ DHCP ѝ 1ȉ Â

```
lease 0 0 1
```

ð ȝ Ô

ȝ	
ip dhcp pool	ŀ DHCP ˫ ˇ DHCP Â

23.1.15 netbios-name-server

DHCP NETBIOS WINS ˫ Ŀ ˇ DHCP ȝ **netbios-name-server** Â ȝ no ˩Л WINS Ŀ Â

netbios-name-server *ip-address* [*ip-address2…ip-address8*]

no netbios-name-server

ð Ô

ip-address	ŀ WINS Ŀ IP Â Â
ip-address2…ip-address8	ˆ ˩ ˜ ˩Л 8 WINS Ŀ Â

ð Ô

ŀ WINS Ŀ Â

ð ȝ Ô

DHCP

ð Ô

ЊЖ WINS Ь ˘ ″I ˘ DHCP ↓ б
WINS Ь ˘ Ю WINS Ь Â

ð Ô

ЛЪЮ ˘ й DHCP WINS Ь 192.168.12.3 Â

```
netbios-name-server 192.168.12.3
```

ð ʒ Ô

ʒ	

ð ȝ Ô

DHCP

ð Ô

DHCP NetBIOS ' 1˜ Broadcasť
˘ NetBIOS ȷ ' 2˜ Peer-to-peeř
˘ WINS Ł NetBIOS ȷ ' 3˜ Mixeď
˘ ″I ȷ ˘ ȷ б WINS Ł
ȷ ' 4˜ Hybriď ˘ ″I WINS Ł
NetBIOS ȷ ˘ ˘ NetBIOS
ȷ Â

Ю˝ й Â
WINS Ł ˘ й ' WINS Ł ˘ й
Â NetBIOS й Hybrid Â

ð Ô

ЛЪЮ ˘ DHCP NetBIOS й Â

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

ð ȝ Ô

ȝ	
ip dhcp pool	Њ DHCP ȷ ˘ DHCP Â
netbios-name-server	DHCP NETBIOS WINS ȷ Ł

23.1.17 network DHCP

Њ DHCP Л ˘ DHCP ȝ
network Â ȝ **no** ˩ Л Њ Â

network *net-number net-mask*

no network

ð Ô

net-number	DHCP IP Л Â
net-mask	DHCP IP Â Њ ˘ й Â

ð Ô

Â

ð ¾ Ô

DHCP

ð Ô

Ю ╟ Ь ˘ ″I ˘ DHCP ↓ б
╟ Ь ˘ Ю ╟ Ь Â

ð Ô

ЛЪЮ ˘ й DHCP ╟ Ь 192.168.12.4 Â

```
next-server 192.168.12.4
```

ð ¾ Ô

¾	
bootfile	Ю DHCP ╟ ˚ ↓
ip dhcp pool	Ю DHCP ↓ ˘ DHCP Â
ip help-address	Ю Helper
option	RGOS ˚ DHCP Ь Â

23.1.19 option

DHCP Ь ˘ DHCP ¾ **option** Â ¾ **no** ↓ Л Ъ option Ю Â

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

no option

ð Ô

code	Ю DHCP ¾ Â
ascii *string*	Ю ASCII Â
hex *string*	Ю Ώ ⁸ Â
ip *ip-address*	Ю IP Â

ð Ô

Â

ð ȝ Ô

ð Ô

DHCP ⁸˘ TCP/IP ў Â
DHCP ж option ˘ ĵ ѝ ↓ ↓ ˘ ↓ Л
ЊЌ DHCP 312 option
DHCP Â⁄ DHCP ≠ ѝ Â
DHCP option ЊЌ RFC 2131 Â

ð Ô

ЛЮ ˘ ȝ 19 ЊЌ ¤ DHCP
IP Â0 IP ' 1 IP ÂЛ
Ю ˘ DHCP IP Â

```
option 19 hex 1
```

ЛЮ ˘ ȝ 33 ЊЌ DHCP
˘ DHCP ч ' 1˜
172.16.12.0˝ 192.168.12.12’ 2˜ 172.16.16.0˝
192.168.12.16 Â

```
option 33 ip 172.16.12.0 192.168.12.12 172.16.16.0
192.168.12.16
```

ð ȝ Ô

ȝ	ЀЌ 1

ѝ Â

ð ৡ Ô

ð Ô

ৡ ৸ DHCP ╟ ˘ DHCP ৸ Л **no ip dhcp pool** ৡ Â

ð Ô

ЛЮ ˘ IP ѝ 192.168.12.100 DHCP Â

```
clear ip dhcp binding 192.168.12.100
```

ð ৡ Ô

ৡ Ŏ

ð ¾ Ô

¾	
ip dhcp ping packets	ĦŘ DHCP Ł ¦ ˘ ă ping Â
show ip dhcp conflict	DHCP Ł ¦ ˘ ă Â

23.2.3 clear ip dhcp server statistics

Æ DHCP Ł ˘ **clear ip dhcp server statistics** ¾ Â

clear ip dhcp server statistics

ð Ô

ŕ Â

ð ¾ Ô

ð Ô

DHCP Ł ˘ DHCP à ╟ à ˘ DHCP Âclear **ip dhcp server statistics** ¾ ┘Л ┘ ˘ ÿ Â

ð Ô

ЛЮ ˘ DHCP Ł Â

```
clear ip dhcp server statistics
```

ð ¾ Ô

¾	
show ip dhcp server statistics	DHCP Ł Â

23.2.4 debug ip dhcp client

DHCP Client ˘ **debug ip dhcp client** ¾ Â

debug ip dhcp client

no debug ip dhcp client

ð Ô

ð Ô

ð ৡ Ô

ð Ô

ৡ dhcp client Ŀ ў ˘ Л
Â

ð Ô

ЛЮ ˘ Э dhcp Â

```
debug ip dhcp client
```

ð ৡ Ô

23.2.5 debug ip dhcp server

DHCP Server ˘ **debug ip dhcp server**
ৡ Â

debug ip dhcp server
no debug ip dhcp server

ð Ô

ð Ô

ð ৡ Ô

ð Ô

ৡ dhcp server ў ˘ Л
Â

ð Ô

ЛЮ ˘ Э dhcp Ŀ Â

```
debug ip dhcp server
```

ð ৡ Ô

23.2.6 show dhcp lease

DHCP ˘ EXEC ৡ **show dhcp lease** Â

show dhcp lease

ð Ô

ð Ô

ὴ Â

ð ৡ Ô

ð Ô

Ⱶ IP ˘ Â Ⱶ IP ˘
ৰ IP Â

ð Ô

ЛЮ ὴ **show dhcp lease** Â

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

23.2.7 show ip dhcp binding

DHCP ˘ EXEC ৡ **show ip dhcp binding** Â

show ip dhcp binding [*ip-address*]

ð Ô

ip-address	ˆ ৰ ˜ ৰ IP Â

ð Ô

ý Â

ð ¾ Ô

ð Ô

Ю IP ˘ Â Ю IP ˘
Ù IP Â

ð Ô

ЛЬЮ ý **show ip dhcp binding** Â

```
Ruijie# show ip dhcp binding
IP address    Client-Id/          Lease expiration  Type
              Hardware address
192.168.1.2   00d0.f866.4777      IDLE              Manual
```

Ю Â

IP address	¶ DHCP IP Â
Client-Id/ Hardware address	DHCP client identifier ¸
Lease expiration	Â Infinite 8' IDLE ˘ Ù DHCP ÿ ╠ Â
Type	Â Automatic ╠¶ ' Manual ¶ Â

ð ¾ Ô

¾	
clear ip dhcp binding	DHCP

23.2.8 show ip dhcp conflict

DHCP ┺ ă ˘ EXEC ¾ **show ip dhcp conflict** Â

show ip dhcp conflict

ð Ô

ð Ô

ὶ Â

ð ʒ Ô

ð Ô

ʒ ˩ Л DHCP Ł ă Â

ð Ô

ЛЮ ὶ **show ip dhcp conflict** ʒ Â

```
Ruijie# show ip dhcp conflict
IP address    Detection Method
192.168.12.1    Ping

dhcpd excluded ipaddress
192.168.12.100
```

Ⱨ Ю Â

IP address	a ˩ DHCP IP Â
Detection Method	ă Â
dhcpd excluded ipaddress	Â

¾ ¸ Л Ц DHCP Ь Â

ð Ô

ЛЦЮ ù **show ip dhcp server statistics** ¾ Â

```
Ruijie# show ip dhcp server statistics
Address pools           4
Automatic bindings       4
Manual bindings          0
Expired bindings         0
Malformed messages 2

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

Message                 Sent
BOOTREPLY                16
DHCPOFFER                9
DHCPACK                  7
DHCPNAK                  0
```

Ы Ю Â

Address pools	
Automatic bindings	╟ Â
Manual bindings	Â
Expired bindings	Â
Malformed messages	DHCP ¸ a Â
Message Received or Sent	DHCP Ь Â

ð ¾ Ô

¾	
clear ip dhcp server statistics	DHCP Ь Â

24 DHCP Relay

24.1 DHCP Relay

DHCP ЛЬЮ ٦'

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

24.1.1 service dhcp

Э DHCP ٦ ˘ ٦ s**ervice dhcp** Â
٦ no ٦Л DHCP ٦ Â

service dhcp

no service dhcp

ð Ô

DHCP ٦ Â

ð ٦ Ô

ð Ô

DHCP ٦Л DHCP è Ł ˘
DHCP DHCP ˘ DHCP Â

ð Ô

ЛЬЮ ˘ DHCP Ł Â

```
service dhcp
```

ð ٦Ô

٦	
ip helper-address [**vrf**] *A.B.C.D*	╗ DHCP server

24.1.2 ip helper-address

٦ ٦Л ╗ DHCP Ł Â ٦ no ˘
Ł Â

Ł ⅃Л ˘ ≠ ⅃Л Â ⅃Л
Ю˝ ≠ ⅃Л Ю ˘ ╗ Ю DHCP
Ł Â

ð Ô

Ł Â

ð Ô

/

ð Ô

⅃Л dhcp Ł ˘ DHCP
Ł Â ⅃Л ÿ Â

vrf ˘ a ⅃'
a vrf ˘ Ł a
vrf Ł ' a vrf ˘ Ł
⅃ vrf'

ð Ô

ЛЮ ˘ ч Ł ˘ ╢ ⅃ vrf Ł ѝ
61.154.26.49˝ Л vrf ⅃ ѝ local Ł ѝ 192.168.197.1 Â

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

ð Ô

service dhcp	DHCP

24.1.3 ip dhcp relay information option dot1x

dhcp option dot1x ╗ ˘ no
dhcp option dot1x ╗ Â

ð Ô

ð Ô

ð Ô

DHCP relay˘ ⅂ 802.1x
Â

ð Ô

ЛЬЮ ˘ Â

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

ð ¾ Ô

¾	
service dhcp	DHCP ¾
ip dhcp relay information option dot1x access-group	option dot1x acl

24.1.4 ip dhcp relay information option dot1x access-group

¾ **dhcp option dot1x acl**˝ ¾ no **dhcp option dot1x acl** Â

ð Ô

a ACL

ð ¾ Ô

ð Ô

¾ а б Э ACL ACE ă Â

ð Ô

ЛЬЮ ˘ Â

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

ð ¾ Ô

¾	
service dhcp	DHCP ¾
ip dhcp relay information option dot1x	DHCP option dot1x ╖

24.1.5 ip dhcp relay information option82

¾ **ip dhcp relay information option82** ╖ ˘
¾ no **ip dhcp relay information option82** ╖ Â

ð Ô

ð ¾ Ô

ð Ô

¾ б option dot1x ¾ Â

ð Ô

ЛЬЮ ˘ Â

```
Ip dhcp relay information option82
```

ð ¾Ô

¾	
Service dhcp	DHCP ¾
ip dhcp relay information option dot1x	DHCP option dot1x ¶

24.1.6 ip dhcp relay check server-id

¾ **ip dhcp relay check** *server-id* ¶ ˘ ¾
no **ip dhcp relay information check** *server-id* ¶ Â

ð Ô

ð ¾ Ô

ð Ô

¾˘ DHCP REQUEST
server-id option server Â

ð Ô

ЛЬЮ ˘ Â

```
Ip dhcp relay check server-id
```

ð ¾Ô

¾	
Service dhcp	DHCP ¾

24.1.7 ip dhcp relay suppression

¢ DHCP ¶ ˘ ¢ no
DHCP ¶ DHCP relay ⁸ ¶ Â

ð Ô

ð ¢ Ô

ð Ô

¢ Л˘ DHCP request a relay Â

ð Ô

ЛЬЮ ˘ 1 relay ⁸ ¶ Â

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

ð ¢ Ô

¢	
service dhcp	DHCP ¢

25 DNS

25.1

25.1.1 ip domain-lookup

╠ DNS ٫ Â ٪ no DNS ٫ ╗ Â

ip domain-lookup

no ip domain-lookup

ð Ô

ы DNS ٫ ╗ Â

ð ٪ Ô

ð Ô

٪ ы DNS ٫ ╗ ˘ ٪˘ ╠ DNS ٫ Â

ð Ô

Ю DNS ٫ ╗ '

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

ð ٪ Ô

٪	
show hosts	DNS Â

ð Ô

25.1.2 ip name-server

٪ ٫ ╘ IP Â ٧ ٫ ╘ ╠ ٫ Â ٪ no ٫ ╘ Â

ip name-server *ip-address*

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

ð Ô

ip-address	ɹ ⊧ IP

ð Ô

ɹ ⊧

ð ३ Ô

ð Ô

╗ DNS Server IP Â ३˘ ╗ DNS Server Â ÿ Server ы ɹ ˘ ɻ Server DNS ˘ и Â

6

ð Ô

ў ˘ ˩Л **no ip host host-name ip-address** ३

ð Ô

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

ð ३Ô

३	
show hosts	DNS Â

ð Ô

25.1.4 clear host

╟ ў ˛ ă ˘ ˩Л ३Â

clear host [*host-name*]

ð Ô

host-name	˩Л ╟ ў ˛ ă Â "*" ३ ╟ ў ˛ ă Â

ð ३ Ô

ð Ô

ў ˛ ă ˘ ч ' 1˜ ip host ' 2˜ DNS ╟ ˝ Â ३˘ DNS ╟ ˝ ў ˛ Â

ð Ô

ЛЮ ˘ ў ˛-IP ă ╟ ˝ Â

```
clear host *
```

ð ३Ô

३	
show hosts	ў ˛ ă

ð Ô

25.1.5 show hosts

DNS Â

show hosts

ð ৡ Ô

ð Ô

DNS Â

ð Ô

```
Ruijie# show hosts
Name servers are:
static
host            type         address
switch          static       192.168.5.243
www.ruijie.com   dynamic      192.168.5.123
```

ð ৡ Ô

ৡ	
ip host	ў ɹ IP
ip name-server	DNS ᒪ

ð Ô

26 SNTP

26.1

ৡ

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

26.1.1 sntp enable

ৡ SNTP ╖ ˘ ৡ **no** ѝ
—Disable Â

[**no**] **sntp enable**

ð Ô

ð Ô

SNTP Disable

ð ৡ Ô

ð Ô

show sntp ৡ SNTP

ð Ô

```
Ruijie(config)# sntp enable
```

ð ৡ Ô

ৡ	
show sntp	SNTP
clock update-calendar	˚ ⊿ ˚
clock set	˚

ð ⊿ Ô

˚ RGOS10.0 Л Э

26.1.2 sntp server

ৡ SNTP Serverˇ SNTP NTP ˇ Л
Server ৶Л internet Э Ω NTP Server Â

sntp server *ip-addr*

no sntp server

ð Ô

ip-addr ' NTP/SNTP ╘ IP

ð Ô

NTP/SNTP ╘

ð ৡ Ô

ð Ô

show sntp ৡ SNTP

ð Ô

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

ð ৡ Ô

ৡ	
show sntp	SNTP
sntp enable	SNTP

ð ৶ Ô

˚ RGOS10.0 Л Э

26.1.3 sntp interval

ৡ SNTP Client NTP/SNTP Server ৶
Â

sntp interval *seconds*

no sntp interval

ð Ô

seconds

й 1800s

ð ¦ Ô

ð Ô

show sntp ¦ SNTP Â

ð Ô

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

ð ¦Ô

¦	
sntp enable	SNTP
show sntp	SNTP
clock update-calendar	˚ ˩ ˚

ð ˥ Ô

˚ RGOS10.0 ЛЪЭ

~

a ˘ ˘

˥ sntp enable ¦ Â

26.2

б ЛЪЮ ¦:

¸ **show sntp**

26.2.1 show sntp

¦ SNTP Â

ð Ô

ð ¦ Ô

ð Ô

show sntp ¾ SNTP

ð Ô

```
Ruijie# show  sntp
SNTP state          : Enable
SNTP server         : 192.168.4.12
SNTP sync interval   : 60
Time zone            : +8
```

ð ¾Ô

¾	
sntp enable	SNTP
show sntp	SNTP

ð Ô

RGOS10.0 Л Э

27 NTP

27.1 NTP

NTP ЛЬЮ ʒ'

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

27.1.1 no ntp

ntp ˩ Ꝉ˘ б Ꝉ ˩ ˘ ntp Â

no ntp

ð Ô

Â

ð Ô

Ю NTP Ꝉ Â

ð ʒ Ô

Â

ð Ô

Ю˘ NTP ╖ ˘ ˩ NTP Ꝉ NTP
⁸˘ NTP ╖ Â

ð Ô

ЛЬЮ ˘ NTP Ꝉ Â

no ntp

ð ¾ Ô

¾	
ntp server	NTP Ł

27.1.2 ntp access-group

NTP Ł 8 ˘ ¾ no ¼ 8 Â

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*

ð Ô

peer	NTP Ł 8 ˘ ≠ б ¼ ˆ ˜ Â

٨˘ a ٧ ╗ Â
٨˘ ٧ è ˘ ٧ ╘ ╗
Â

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

Â

ð Ô

è ٪ ٨˘

٨ Â

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

ð ٦ Ô

ntp authentication-key	
ntp trusted-key	Â

27.1.4 ntp authentication-key

٪ NTP ╘ NTP Â

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

˘ md5 ╗ ˘ key-id
˘ ┘Л **ntp trusted-key** key-id ѝ
Â

Э ѝ 1024 ˘ Ь

ð Ô

ЛЮ ID ѝ 6

```
ntp authentication-key 6 md5 wooooop
```

ð ʒ Ô

ʒ	
ntp authenticate	8
ntp trusted-key	
ntp server	NTP Ь

27.1.5 ntp disable

NTP ╗ Â

ntp disable

ð Ô

Â

ð Ô

Ю ┘Л ┘ NTP Â

ð ʒ Ô

Â

ð Ô

Ю˝ Э ┘ NTP ┘Л
˘ ╗ ˘ ┘Л Э NTP Â

~

IP ˘ è
Э ʒ Â

ð Ô

ЛЬЮ ˘ NTP Â

```
no ntp
```

ð ʒ Ô

Â

27.1.6 ntp master

ѝ NTP ў ˆ ↵ ˜ ˘ ѝ è
↵ Â ʒ no ѝ ↵ NTP ў Â

ntp master *[stratum]*
no ntp master

ð Ô

ð Ô

ЛЪЮ ⅃ ˇ è ѝ 12 Â

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

ð ʒ Ô

27.1.7 ntp server

ѝ NTP NTP Ł Â

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

no ntp server *ip-addr*

ð Ô

ip-addr	NTP Ł IP ˇ IPv4 IPv6ʾ
version	^ ⅃ ~ NTP ^ 1-3˜ˇ NTPv3 ,
if-name	^ ⅃ ~ NTP ^ Ь ~,
keyid	^ ⅃ ~ б Ł ╗
prefer	^ ⅃ ~ Ł ѝ Prefer Ł

ð Ô

NTP Ł Â

ð ʒ Ô

Â

ð Ô

Ł ˇ ⅄ Ł Э ѝ 20 Â

б Ł ╗ ˇ ˝I ╗ Л
ˇ л ѝ Ł ˇ ⅃Л Ł ╗
ˇ б Ł ╗ Ł ⅄ ╗ б

⅄ ^ ~ Юˇ ˝I prefer ⅄

NTP Ю˘ ѝ
IP ˩Л NTP ┗ Â

ð Ô

ЛЮ ˘ Э ѝ NTP server Â

IPv4 ' Ruijie(config)# ntp server 192.168.210.222

ð ¾Ô

¾	
no ntp	NTP ┗╖ Â

27.1.8 ntp trusted-key

ID ѝ

ntp trusted-key *key-id*

no ntp trusted-key *key-id*

ð Ô

key-id	ID Â

ð Ô

Ю Â

ð ¾ Ô

Â

ð Ô

NTP ˩ ˩ ˘ ID ˘
a ˘ Л ,

ð Ô

ЛЮ ˘ ѝ ┗ Â

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

ð ¾Ô

¾	

ntp authenticate	⁸ Â
ntp authentication-key	NTP Â
ntp server	NTP Ł Â

27.1.9 ntp update-calendar

NTP ÿ ⅄
˚ Â ʒ no ⅄ ˚ ℸ Â

ntp update-calendar
no ntp update-calendar

ð Ô

ð Ô

˚ ℸ Â

ð ʒ Ô

Â

ð Ô

ℸ ⅄Ⱡ NTP ÿ ⅄
˚ Â ˚ Æ
Ю ÿ ╟ Â

Ю NTP ˚ Â ⅄˘ NTP
б ⅄ ℸ ≠ ⅄ ˚ Â

ð Ô

ⰬЮ NTP ˚ '

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

ð ʒ Ô

27.2

- **debug ntp**
- **show ntp status**

27.2.1 debug ntp

NTP Â

debug ntp

no debug ntp

ð Ô

Â

ð Ô

Â

ð ꝛ Ô

Â

ð Ô

NTP ╖ ˘ ┘Л ꝛ ˘
Â

ð Ô

ЛЬЮ ˘ NTP Â

`debug ntp`

ð ꝛ Ô

Â

27.2.2 show ntp status

NTP Â

show ntp status

ð Ô

Â

ð Ô

ѝ Â

ð ꝛ Ô

ð Ô

NTP Ł ˘ NTP ˘ ╖ ⅄

Ł ʒ a Â

ð Ô

ЛЬЮ ˘ NTP Â

```
show ntp status
```

ð ʒ Ô

28 UDP-Helper ¯

28.1

28.1.1 udp-helper enable

udp-helper enable	¯	╟ UDP	╖	Â **no**
udp-helper enable	¯	UDP	╖	Â

ip helper-address *address*

no ip helper-address *address*

ð Ô

address	UDP Ł ˘ ŭ ˚ 8 ˘ 20 Ł Â

ð Ô

UDP Ł

ð ¾ Ô

ð Ô

˩ Л ŭ 20 Ł Â Ł Э , ╠ UDP-Helper ╖ Л˘ ÿ UDP ˘ Л Э Ł Э Â

no ip helper-address ˩ Ł Â

ð Ô

Ю UDP Ł '

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

ð ¾ Ô

¾	
ip forward-protocol	UDP

ð Ô

28.1.3 ip forward-protocol

¾ UDP Â ¾ **no** ˩ UDP ╖ Â

ip forward-protocol udp [*port* | **tftp | domain | time | netbios-ns | netbios-dgm | tacacs**]

no ip forward-protocol udp [*port* | **tftp | domain | time | netbios-ns | netbios-dgm | tacacs**]

ð Ô

port	˘ a 69,53,37,137,138,49 Â
tftp	Trivial File Transfer Protocol(69) ˘ UDP /ı ˙ 69 Â
domain	Domain Name System(53) ˘ UDP /ı ˙ 53 Â
time	Time service(37) ˘ UDP /ı ˙ 37 Â
netbios-ns	NetBIOS Name Service(137)

29 SNMP

29.1

SNMP ЛЬЮ ¾'

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

29.1.1 no snmp-server

SNMP ¾ ╖ ˘ ¾ **no snmp-server** Â

no snmp-server

ð Ô

SNMP ¾ ╖

ð ¾ Ô

ð Ô

¾ SNMP ¾ Ь Â

ð Ô

Ю SNMP ¾ Ь'

```
Ruijie(config)# no snmp-server
```

29.1.2 snmp-server chassis-id

SNMP

३	
snmp-server host	SNMP ў

29.1.6 snmp-server host

SNMP ў ^ NMS˜ ˘ ३
snmp-server host Â ३ no ৸ SNMP ў Â

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

no snmp-server host *host-addr*

ð Ô

host-addr ' SNMP ў

ipv6-addr ′ SNMP ў ^ ipv6˜

vrfname ' vrf ৶

version ' snmp ˘ V1 à V2C à V3

auth | **noauth** | **priv** ' V3 Â

community-string ' ৶^ V3 ˜ Â

port-num ' snmp ў

notification-type ' ў ╟ ˘ snmp Â

ð Ô

Ю˘ SNMP ў Â

˘ Â

ð ३ Ô

ð Ô

३ б ३ **snmp-server enable traps** ˘ ў ╟ NMS Â

৸Л a ৶ SNMP ў ˘ ў ৸Л
a ৶ ˘ a ৶ ˘ a ৶ vrf ˘ a ৶ ў
[৶ à ৶ vrf] ৴ ˘
৶ ў a ৶ ˘ ৸ a ৶ Â

ð Ô

Ю SNMP ў ˘ SNMP Y˚ '

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

ð ৡ Ô

ৡ	
snmp-server enable traps	

29.1.7 snmp-server location

SNMP Æ ˘ ৡ **snmp-server location** Â ৡ no ৸ SNMP Æ Â

snmp-server location *text*

no snmp-server location

ð Ô

text ' Â

ð Ô

ѝ

ð ৡ Ô

ð Ô

Ю '

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

loca[(-city 4F gy)]Tf A Bulide(

ð Ô

byte-count ˘ ÿ 484 17876 Â

ð Ô

1500

ð ¾ Ô

ð Ô

Ю SNMP ù 1492'

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

ð ¾Ô

¾	
snmp-server queue-length	SNMP

29.1.9 snmp-server queue-length

˘ ¾ **snmp-server queue-length** Â

snmp-server queue-length *length*

ð Ô

length ' ˘ ÿ 1 1000 Â

ð Ô

10

ð ¾ Ô

ð Ô

˘ ┘Л Ъ ¾
⁸ Â ù 4 Â

ð Ô

Ю ù 4 '

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

ð ¾Ô

٪	
snmp-server packetsize	SNMP

29.1.10 snmp-server system-shutdown

SNMP ╖ ˘ ٪ **snmp-server system-shutdown** Â ٪ no ↙ SNMP ╖ Â

snmp-server system-shutdown

no snmp-server system-shutdown

ð Ô

SNMP ╖

ð ٪ Ô

ð Ô

٪ SNMP ╖ ˘ RGOS reload/reboot Л↻ NMS Â

ð Ô

Ю SNMP ╖ '

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

29.1.11 snmp-server trap-source

SNMP ˘ ٪ **snmp-server trap-source** Â ٪ no Â

snmp-server trap-source *interface*

no snmp-server trap-source

ð Ô

interface ' й SNMP

ð Ô

SNMP ÿ ˘ IP й Â

ð ٪ Ô

ð Ô

Ю SNMP ÿ ˘ IP
ѝ ˘ ѝ ˘ ˩ Л IP
ѝ SNMP Â

ð Ô

Ю Л 0 IP ѝ SNMP '

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

ð ȝ Ô

ȝ	
snmp-server enable traps	ў ╟
snmp-server enable host	NMS ў

29.1.12 snmp-server trap-timeout

Ћ ˘ ȝ **snmp-server trap-timeout** Â ȝ no Â

snmp-server trap-timeout *seconds*

no snmp-server trap-timeout

ð Ô

seconds ' ˘ Æ ѝ Â

ð Ô

30

ð ȝ Ô

ð Ô

Ю ѝ 60 '

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

ð ȝ Ô

ȝ	
snmp-server queue-length	
snmp-server enable host	NMS ў

29.1.13 snmp-server user

SNMP ˘ ঳ **snmp-server user** Â ঳ no 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 Ô

username ' ﾉ Â

groupname' ﾉ

v1 | **v2** | **v3** ' SNMP Â ﾍ v3 ﾉ Â

encrypted ' ﾐ Â ˘ ﾉ Â

ﾉ ˘ 16 ﾸ Â MD5 ﾐ 16 ˘ SHA ﾐ 20 Â ﾉ ч Â ╗ Â

auth ' Â**md5** MD5 Â**sha** SHA Â

auth-password: ঳ ˆ a 32 ˜ Â ঳ Â

priv ' Â **des56** 56 Æ DES ╗ Â *priv-password* ' ﾐ ╗ ঳ ˆ a 32 ˜ Â ঳ ╗ Â

ð Ô

Â

ð ঳ Ô

ð Ô

Ю snmpV3 ˘ md5 ˘ DES ╗ '

```
Ruijie(config)# snmp-server user user-2 mib2user v3 auth
md5 authpassstr priv des56 despassstr
```

ð ঳ Ô

঳	
show snmp user	SNMP

29.1.14 snmp-server group

SNMP ३

view-name ' ¸ Â

oid-tree ' MIB ˘ MIB Â

include ' MIB Â

exclude ' MIB Â

ð Ô

default ˘ MIB Â

ð ¾ Ô

ð Ô

ЮО ˘ MIB-2 ˆ oid и 1.3.6.1˜ '

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

ð ¾Ô

¾	
show snmp view	SNMP

29.1.16 snmp-server if-index persist

snmp-server if-index persist ¾ Â ¾ **no** Â

snmp-server if-index persist

no snmp-server if-index persist

ð Ô

ð Ô

Â

ð ¾ Ô

ð Ô

ЮО '

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

ð ¾Ô

¾	
show run	

29.2

29.2.1 show snmp

SNMP ˘ ¾ **show snmp** Â

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

ð ¾ Ô

ð Ô

show snmp ¾ SNMP '

show snmp mib snmp mib '

show snmp user snmp '

show snmp view snmp '

show snmp group snmp '

ð Ô

Ю SNMP '

```
Ruijie# show snmp
Chassis: 60FF60
0 SNMP packets input
0 Bad SNMP version errors
0 Unknown community name
0 Illegal operation for community name supplied
0 Encoding errors
0 Number of requested variables
0 Number of altered variables
0 Get-request PDUs
0 Get-next PDUs
0 Set-request PDUs
0 SNMP packets output
0 Too big errors (Maximum packet size 1500)
0 No such name errors
0 Bad values errors
0 General errors
0 Response PDUs
```

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

ð ¾Ô

¾	
snmp-server *chassis-id*	SNMP /Ì

30 RMON

30.1

RMON ЛЪЮ ৡ'

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

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

¸ **rmon alarm** *number variable interval* {**absolute** | **delta** } **rising-threshold** *value* [*event-number*] **falling-threshold** *value* [*event-number*] [**owner** *ownername*]

¸ **rmon event** *number* [**log**] [**trap** *community*] [*description-string*]

¸ **show rmon statistics**

¸ **show rmon history**

¸ **show rmon events**

¸ **show rmon alarms ion stat/TT2 1 TfTf0 Tc 0 Tw 11.697 0 Td( )**

ð ¯ Ô

¯	
rmon collection history *index* [**owner** *owner-name*] **buckets** *bucket-number* **interval** *seconds*	¶ ¸ 8

30.1.2 rmon collection history

Л ¸ ¯ Â **no** ¸ Â

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

no rmon collection history *index*

ð Ô

ð ¯ Ô

ð Ô

RGOS ˚ ˘ Л ¸ ˘
owner à buckets Л interval ˘
a ˘ Ю ¸ ˘
,

ð Ô

ЛЮ ˘ ¸Л Л 1 ¸ Â

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

rmon alarm *number variable interval* {**absolute** | **delta** } **rising-threshold** *value* [*event-number*] **falling-threshold** *value* [*event-number*] [**owner** *ownername*]

no rmon alarm *number*

ð Ô

ð ϡ Ô

ð Ô

RGOS ˚ ˘ Л↓ ↓ ˘ variable à interval à absolute/delta à owner à interval à rising-threadhold/falling-threadhold è event ˘ a ˘ Ю Y˚ ˘ ,

ð Ô

ЛЦЮ ˘ MIB ↓ ifInNUcastPkts.6 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
```

ð ϡ Ô

ϡ	
rmon event *number* [**log**] [**trap** *community*] [*description-string*]	╕ Y˚ Ⱨ

ð Ô

ЛЬЮ ˘ ЊЖ Y ˚ ╟ ' Y ˚ à trap Â

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

ð ३ Ô

३	
rmon alarm *number variable interval* {**absolute** | **delta** } **rising-threshold** *value* [*event-number*] **falling-threshold** *value* [*event-number*] [**owner** *ownername*]	╕

30.2

30.2.1 show rmon statistics

Â

show rmon statictics

ð Ô

ð ३ Ô

ð Ô

ð Ô

ЛЬЮ ˘ '

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

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

ð ƻ Ô

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

30.2.2 show rmon history

Â

show rmon history

ð Ô

ð ƻ Ô

ð Ô

ð Ô

ЛЬЮ ˘ '

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

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

ð ¾Ô

¾	
rmon collection history *index* [**owner** *ownername*] [**buckets** *bucket-number*] [**interval** *seconds*]	¶ ¼ ⁸

30.2.3 show rmon alarm

Â

show rmon alarm

ð Ô

ð ¾ Ô

ð Ô

ð Ô

ЛЬЮ ˘ '

```
Ruijie# show rmon alarm
Event : 1
Description : firstevent
Event type : log-and-trap
Community : public
Last time sent : 0d:0h:0m:0s
Owner : zhangsan
Log : 1
Log time : 0d:0h:37m:47s
Log description : ipttl
```

```
Log : 2
Log time : 0d:0h:38m:56s
Log description : ipttl
```

ð ¾Ô

¾	
rmon alarm *number variable interval* {**absolute** | **delta** } **rising-threshold** *value* [*event-number*] **falling-threshold** *value* [*event-number*] [**owner** *ownername*]	¶

30.2.4 show rmon event

Â

show rmon event

ð Ô

ð ¾ Ô

ð Ô

ð Ô

ЛЬЮ ˘ '

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

rmon event *number* [**log**] [**trap** *community*] [*description-string*]	╕ Y ˟

31 IPFIX

31.1 IPFIX

31.1.1 cache

IPFIX Ю, **cache** ⅋ ѝ ┘
Â ⅋ no Â

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

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

ð Ô

entries *number* ' . ┘Л ѝ
1024 131072.

timeout ' ˘ ↑ ѝ Â

active *minutes* ' ˘ ˘
┘Л ┘Л ˘ Æ ѝ↑ ˘ ѝ 1¨ 60 ↑
˘ ѝ 30↑ Â

inactive *seconds* ' ˘
˘ Â ѝ 10¨ 600 Â
ѝ 15 Â

ð Ô

ѝ 4096

ѝ 30↑

ѝ 15

ð ⅋ Ô

IPFIX

ð Ô

⅋ IPFIX ╖ ˘
Â ˘ a Э ˘
┘ ╟ Л Â

ð Ô

Ю Ю ầ
'

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

ð ¾Ô

¾	
show ip flow cache	ÿ ÞO
show ip flow cache aggregation	

31.1.2 cache-timeout

top-talker Â

cache-timeout *milliseconds*

no cache-timeout

ð Ô

milliseconds ' top-talker ˘ ' 1 ~ 3,600,000ˆ 1 1 ~ Â

ð Ô

' 5,000ms

ð ¾ Ô

top-talker

ð Ô

ð Ô

ÞO top-talker

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

ð ¾Ô

31.1.3 clear ip flow stats

ÞO¯ ¾ Â

clear ip flow stats

ð Ô

ð Ô

ð ȝ Ô

ð Ô

ȝ IPFIX ╖ ˘ show ip cache flow ⅃ Л℧ IP ˘ clear ip flow stats ȝ , ⁸ Â

ð Ô

ЮO Ip

```
Ruijie# clear ip flow stats
```

ð ȝ Ô

ȝ	
show ip flow cache	ў ЮO
show ip flow cache aggregation	

31.1.4 enabled (aggregation cache)

IPFIX ЮЎ **enabled** ȝ ╖ Â ȝ no Â

enabled

no enabled

ð Ô

ð Ô

╖

ð ȝ Ô

IPFIX

ð Ô

ȝ IPFIX ╖

ð Ô

ÞÔ **protocol-port** ¶ :

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

ÞÔ **protocol-port** ¶ :

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

ð ¾ Ô

¾	
ip flow-aggregation cache	
cache	
export destination (aggregation cache)	ÞÖ
mask (IPv4)	ì
show ip flow cache aggregation	

31.1.5 export

IPFIX ÞÖ **export** ¾ ¶
ˇ ¾ no
ì Â

export {**destination** [*ip-address* | *hostname*] *udp-port* } | **version** [**9**|**10**] | **template** [**refresh-rate** *packets* | **timeout-rate** *minutes*]

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

ð Ô

destination *ip-address* | *hostname udp-port* '
/Ì

version [**9** | **10**] ' Â Version 9 Netflow V9
ˇ version 10 IETF ˇ version 10 Â

template ' refresh-rate timeout-rate

refresh-rate *packets* ' ^ ȷ ~ ˇ Ƨ ȕ
Æˇ ȷ ȕ 1 600 ˇ ȕ 20

timeout-rate *minutes* ' ^ ȷ ~ ˇ Ƨ ǂ ȕ
Æˇ ȷ ȕ 1 3600ǂ ˇ ȕ 10ǂ

ð Ô

refresh-rate ȕ 20

timeout-rate ȕ 10ǂ

ð ȝ Ô

IPFIX

ð Ô

ȝ IPFIX ɱ Â **export destination** ȷƧȕ ч Â

ð Ô

Ю ȕ protocol-port ч '

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

Ю ȕ **protocol-port** Ƨ

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

ð ȝ Ô

ȝ	
ip flow-aggregation cache	
cache	

export destination
(**aggregation cache**)

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

ð ¾ Ô

¾	
flow-sampler-map	
mode random one-out-of	

31.1.7 flow-sampler-map

¾ Hπ ˘ ¾ no
Â

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

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

ð Ô

sampler-map-name ' Hπ ⊿ Â

ð Ô

ЮЎ

ð ¾ Ô

ð Ô

IPFIX ╖ ˘ a б **ip flow ingress** à **ip flow egress** Л∪ ingress service-policy ⊿ Â ⊿ ˘ ″I Ю'

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

flow-sampler

service-policy

ð Ô

Ю 2/2 Â

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

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

ð ৡ Ô

ৡ	
flow-sampler	
mode random one-out-of	

31.1.8 ip flow egress

Ю ˘ **ip flow egress** ৡ
˘ ৡ no Â

ip flow egress

no ip flow egress

ð Ô

ð Ô

˘

ð ৡ Ô

ð Ô

ৡ Э IPFIX ╖ Â
ip flow egress ip flow Ingress˘ IPFIX ╖ Â

ð Ô

Ю 1/1 IP ╖ Â

```
Ruijie(config)# interface gigabitEthernet 1/1
Ruijie(config-if)# ip flow egress
```

ð ৡ Ô

ৡ	
ip flow-aggregation cache	
cache	
export destination (**aggregation cache**)	Ю˘

३ ЮЎ **ip flow-aggregation cache** ३
˘ ⅄ ३ ˘ ३ **no**
˘ ३ ЮЎ
no enabled ३ Â

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

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

ð Ô

as ' AS˜ ˜

as-tos ' AS-Tos

destination-prefix ' **destination-prefix**

destination-prefix-tos ' **destination-prefix-tos**

prefix ' **prefix**

prefix-port ' **prefix-port**

prefix-tos ' **prefix-tos**

protocol-port ' **protocol-port**

protocol-port-tos ' **protocol-port-tos**

source-prefix ' **source-prefix**

source-prefix-tos ' **source-prefix-tos**

ð Ô

ð ३ Ô

ð Ô

३ IPFIX ╖ Â **export**
destination ३ ⅄ ч Â ⅄ ╖ Tos
˘ Tos ˘ Tos
IP 8 Æ ˘ IP Ł Â
ЮО '

ˆ **prefix** à **prefix-port** à **prefix-tos** à **source-prefix** à **sourece-prefix-tos** ÞO Â

ˆ **prefix** à**prefix-port** à**prefix-tos** à**destination-prefix** **destination-prefix-tos** ÞO Â

prefix ÞÕ a Â

31.1.11 ip flow-cache entries

Ю ʒ **ip flow-cache entries** ў
˘ ʒ **no** ѝ Â

ip flow-cache entries *number*

no ip flow-cache entries

ð Ô

Number ' ┘ ˘ ÿ 1024 580000.
ѝ 65536 (64K) Â

ð Ô

65536 (64K)

ð ʒ Ô

ð Ô

Ю ┘Ћ ↑ Â ˘
┘Ћ Â
˘ 580000 Â show ip cache flow ┘Ћ Â

~

ip flow egress	╗ Â
ip flow-cache timeout	ў Ю
show ip flow interface	IPFIX ╗ Â

31.1.12 ip flow-cache timeout

Ю **ip flow-cache timeout** ʒ
Â ʒ **no** й Â

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

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

ð Ô

active *minutes* ' ^ ┘ ~ ˘
˘ ў ┘Л ˘ Æ й† ˘ й 1 60
† ˘ й 30† Â

inactive *seconds* ' ^ ┘ ~ ˘
˘ Â й 10 600
Â й 15

ð Ô

й 30†

й 15

ð ʒ Ô

ð Ô

ʒ ў Â
˘ й ˘
^ ~ ˘
˘ Â

ð Ô

Ю '

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

Ю '

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

ð ʒ Ô

refresh-rate *packets* ' ˘ Л∪ ѝ Æ˘
ѝ 1 600 Â ѝ 20 Â **-eets**

¾	
ip flow ingress	¶ Â
ip flow egress	¶ Â
ip flow-cache timeout	ÿ Ю
show ip flow cache	ÿ Ю Â
show ip flow interface	IPFIX ¶ Â

31.1.14 ip flow-top-talkers

¾ **ip flow-top-talker** ˘ top talker ¶ Â

ip flow-top-talkers

no ip flow-top-talkers

ð Ô

ð Ô

top talker ¶

ð ¾ Ô

ð Ô

¾ a ˘ **top** *number* **sort-by** [**bytes** | **packets**] Â

¾ **no** ˘ **top-talker** ¶

ð Ô

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

31.1.15 mask (IPv4)

Ю˘ **mask** ¾ Â
¾ no è й Â

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

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

ð Ô

destination '

source '

minimum '

value ' Æ ˘ й 1¨ 32

ð Ô

й 0˝ mask

ð ʒ Ô

ð Ô

˧ Л Ъ è IP ˘
˘ ^ ᾱ ~ б б ˘
б й ᾱ Â ˧ Л Ъ
' ˘ ˘
˧ ˘ ˧ Â
˧ ЛЪЮ '
¸ (˧ ˧ Л Ъ)
¸ TOS (˧ ˧ Л Ъ)
¸ (˧)
¸ Prefix-port (˧)
¸ Prefix-TOS (˧)
¸ Source prefix (˧)
¸ Source prefix TOS (˧)

ð Ô

٣	
ip flow ingress	╗ Â
ip flow egress	╗ Â
ip flow-cache timeout	ў Ю
show ip flow cache	ў Ю Â
show ip flow interface	IPFIX ╗ Â

31.1.16 match

٣ top-talker ٦ ˚ Â ٣ no ٦ ˚ Â

match { **byte-range** {*max-byte-number min-byte-number* | **max** *max-byte-number*| **min** *min-byte-number*} | **destination** {**address** *ip-address* [*mask* | */nn*] | **as** *as-number* | **port** {*max-port-number min-port-number* | **max** *max-port-number* | **min** *min-port-number*}} | **direction** {**egress** | **ingress**} | **input-interface** *interface-type interface-number* **| nexthop-address** *ip-address* [*mask* | */nn*] **| output-interface** *interface-type interface-number* | **packet-range** {*max-packets min-packets* | **max** *max-packets* | **min** *min-packets*} | **protocol** {*protocol-number* | **tcp** | **udp**} | **source** {**address** *ip-address* [**mask** | */nn*] | **as** *as-number* | **port** {*max-port-number min-port-number* | **max** *max-port-number* | **min** *min-port-number*}} | **tos** {*tos-byte* | **dscp** *dscp* | **precedence** *precedence*}}
no match { **byte-range | destination [address | as | port] | direction | flow-sampler | input-interface | nexthop-address** | **output-interface** | **packet-range** | **protocol** | **source [address | as | port]** | **tos**}

ð Ô

byte-range' ٦ ˚ и IP Â

max-byte-number

min-byte-number

IP б ˘ ы ' 1–4294967295 Â

max *max-byte-number*' IP ˘ ы ' 1–4294967295 Â

min *min-byte-number*' IP ˘ ы ' 1–4294967295 Â

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

destination address' ٦ IP Â

ip-address ˝ ˥ IP Â

mask ˝ IP ˘ ˸ 10 ˢ ˘ ˝ 255.255.255.0

/nn ˝ Л∪ CIDR IP ˘ ˝ mask 255.255.255.0˝ ˸ ˝ /24 Ł Â

destination as ˝ ˥ Â

as-number ˝ ˾ Â

destination port ˝ ˥ ˾ Â

max-port-number

min-port-number

˾ б Â ˻ ˝ 0-65535 Â

max *max-port-number* ˝ ˾ Â ˻ ˝ 0-65535 Â

min *min-port-number* ˝ ˾ Â ˻ ˝ 0-65535 Â

direction egress ˝ ˥ Â

direction ingress ˝ ˥ Â

input-interface *interface-type interface-numbe*r ˝ ˥ ˚ ˸

nexthop-address ˝ ˥ Ю IP Â

ip-address ˝ ˥ IP Â

mask ˝ IP ˘ ˸ 10 ˢ ˘ ˝ 255.255.255.0

/nn ˝ Л∪ CIDR IP ˘ ˝ mask 255.255.255.0˝ ˸ ˝ /24 Ł Â

output-interface *interface-type interface-number* ˝ ˥ ˚ ˸ Â

packet-range ˝ ˥ ˚ ˸ IP Â

max-packets

min-packets

IP б IP Â ˻ ˝ 1–4294967295 Â

max *max-packets* ˝ IP ˘ ˻ ˝ 1–4294967295 Â

min *min-packets* ˝ IP ˘ ˻ ˝ 1–4294967295 Â

protocol ˝ ˥ ˚ ˸ ˾ Â

protocol-number ˝ ˾˘ ˻ ˝ 0-255 Â

tcp ˝ ˾ tcp Â

udp ˝ ˾ udp Â

source address ˝ ˥ IP Â

ip-address ˝ ˥ IP Â

mask ˝ IP ˘ ˸ 10 ˢ ˘ ˝ 255.255.255.0

/nn ˝ Л∪ CIDR IP ˘ ˝ mask 255.255.255.0˝ ˸ ˝ /24 Ł Â

source as ˝ ˥ Â

as-number' /¹ Â

source port' ¬ /¹ Â

max-port-number

min-port-number

/¹ б Â ¼ ' 0-65535 Â

max *max-port-number*' /¹ Â ¼ ' 0-65535 Â

min *min-port-number*' /¹ Â ¼ ' 0-65535 Â

tos' ¬ TOS Â

tos-byte' ¬ tos Â

dscp *dscp*' ¬ TOS dscp Â

precedence *precedence*' ¬ TOS precedence Â

ð Ô

¬ ¸ Â **sort-by** Â

ð ¾ Ô

ip flow-top-talker

ð Ô

ð Ô

Ю '

```
Ruijie(config-flow-top-talks)#match input-interface
fa 0/1
```

ð ¾ Ô

31.1.17 mode(Flow Sampler Configuration)

¾ ¸ no

mode random one-out-of *packet-interval*

ð Ô

packet-interval ' *packet-interval* ¸ Â

ð Ô

Ю Â

ð ¾ Ô

ð Ô

ð Ô

Ю 2/2 Â

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

ð ৡ Ô

ৡ	
flow-sampler	

31.1.18 sort-by

ৡ ą̈ p d

Ñ Ô

31.1.19 top

ৡ top-talker Â ৡ no ˘
ʌ˘ top-talker ˘ ℸ

top *number*

no top

ð Ô

number top-talker ˘ ' 1-200 Â

ð Ô

Â

ð ৡ Ô

top-talker

ð Ô

ð Ô

ЮO top '

```
Ruijie(config-flow-top-talks)#top 150
```

ð ৡ Ô

31.2 IPFIX

31.2.1 show flow-sampler

ৡ è Â

er-7(e2(m)46ae-ename

ð Ô

```
Ruijie# show flow-sampler my_sampler
Sampler : my_sampler, id : 1, packets matched : 10, mode :
random sampling mode
sampling interval is : 666
```

ð ঽ Ô

31.2.2 show ip flow cache

ঽ **show ip flow cache** Â

show ip flow cache

ð Ô

ð Ô

ð ঽ Ô

ð Ô

ў IP Л ў

ð Ô

```
Ruijie(config)# show ip flow cache
IP Flow Switching Cache, 4456448 bytes
3 active, 65533 inactive, 820628747 added
0 flow alloc failures
Exporting flows to 1.1.15.1 (2057)
820563238 flows exported in 34485239 udp datagrams, 0
failed
Last clearing of statistics 00:00:03

Protocol   Total     Flows   Packets  Bytes  Packets
Active(Sec) Idle(Sec)
--------   Flows      /Sec    /Flow      /Pkt    /Sec
/Flow       /Flow
TCP-BGP      71       0.0      1          49       0.0
2.5         15.8
UDP-other    17     0.0     1        328     0.0     0.0
15.7
ICMP      18966     6.7     10        28     72.9    0.1
```

```
22.9
Total:    19054    6.7    10        28    72.9    0.1
22.9

SrcIf        SrcIPAddress DstIf         DstIPAddress
Pr TOS Flgs Pkts
Port Msk AS               Port Msk AS  NextHop
B/Pk Active
Et1/1         52.52.52.1    Fd4/0         42.42.42.1
01  55  10   3748
0000 /8  50                0000 /8  40 202.120.130.2
28   17.8
Et1/2        52.52.52.1    Fd4/0        42.42.42.1
01  CC  10   3568
0000 /8  50                  0000 /8  40 202.120.130.2
28   17.8
Et1/2         10.1.3.2       Fd4/0        42.42.42.1
01 C0  10   1124
0000 /0 0                  0000 /8 40   202.120.130.2
28   17.8
...
```

ð ¾Ô

¾	
clear ip flow stats	
show ip flow interface	IPFIX ╖ Â

31.2.3 show ip flow cache aggregation

ÞÖ **show ip flow cache aggregation** *mode*
Â

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

ð Ô

as

destination-prefix-tos ' TOS
Â

prefix ' Â

prefix-port ' .
Â

prefix-tos ' TOS Â

protocol-port ' Â

protocol-port-tos ' TOS
Â

source-prefix '
Â

source-prefix-tos ' TOS
Â

ð Ô

ð ʒ Ô

ð Ô

Ю IP Л

ð Ô

```
Ruijie# sh ip flow cache aggregation protocol-port
IP Flow Switching Cache, 278544 bytes
2 active, 4094 inactive, 102 added
0 flow alloc failures

Prot SrcPort DstPort Flows Pkts B/Pk Active
0x01 0000    0000       15   17K   28    17.8
0x01 0000    0000        1   3568  28    17.8
```

ð ʒ Ô

31.2.4 show ip flow export

Ю **show ip flow export**
˘ ў Л è Â

show ip flow export

ð Ô

ð Ô

ð ३ Ô

ð Ô

```
Exporting using source IP address 172.16.6.2
Version 9 flow records
Template ID = 260
Template timeout = 120
```

ð Ô

Ю IP Лυ

ð Ô

```
Ruijie# show ip flow interface
FastEthernet 0/1
ip flow ingress
```

ð ʒ Ô

31.2.6 show ip flow top-talkers

ʒ ˘ ר (ʒ match) б ˆ
ʒ sort-by˜ Â

show ip flow top-talkers

ð Ô

ð Ô

ð ʒ Ô

ð Ô

ð Ô

```
Ruijie# show ip flow top-talkers
SrcIf SrcIPaddress     DstIf  DstIPaddress   Pr SrcP
DstP Bytes
Gi1/1  10.10.18.1       Gi1/2 172.16.10.232  11 00A1
00A1 144K
Gi1/1  10.10.19.1       Gi1/2 172.16.10.2    11 00A2
00A2 144K
Gi1/1  172.30.216.196   Gi1/2 172.16.10.2    06 0077
0077 135K
Gi1/1  10.162.37.71     Gi1/2  172.16.10.2    06 0050
0050 125K
Gi1/1  10.92.231.235    Gi1/2 172.16.10.2    06  0041
0041  115K
5 of 5 top talkers shown. 11 flows processed
```

ð ʒ Ô

VRF

clear ip route vrf *vrf-name* {* | *network* [*mask*]}

ð Ô

vrf-name	VRF ¸
*	VRF
network	^ ¸ ~
mask	^ ¸ ~

ð ¾ Ô

ð Ô

¾ Â

ð Ô

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

ð ¾Ô

show ip route vrf

ð Ô

RGOS10.1 Л Э

32.1.3 ip vrf

VRF VRF è no

ip vrf *vrf-name*

no ip vrf *vrf-name*

ð Ô

vrf-name ' VRF ¸

ð ¾ Ô

ð Ô

¾ VRF

ð Ô

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

ð Ô

RGOS10.1 Л Э

~

RGOS 10.3(4) ʌ S86 E ´ MPLS ´
VRF˜ ˘ a VRF Â

32.1.4 rd

rd *rd_value*

ЬЖ vrf rd ˘ VRF Â Ю VRF
ɻ a ɻ˘ ɳ rd ˘ ѝ ɻ VRF˜
Ю VRF Â

ð Ô

rd_value ɳ Л∪ ч a ɻ '

1) rd_value as_num' nn

an_num Ὼ ʌ˘ nn ЬЖ

2) rd_value ip_addr:nn

ip_addr IP ˘ nn ЬЖ

ð Ô

Ю rd ˘ ѝ vrf rd

ð ֽ Ô

vrf

ð Ô

ЬЖ vrf˜ з ѝ RD ˘ ╕ RD Â
RD ˘ ɳ vrf ″I ˘ ʌ Ậ ѝ RD
Â

vrf ɳ RD ˘ ╕ ѝ ЬЖ RD Â

ð Ô

```
Ruijie(config)# ip vrf vrf1
Ruijie (config-vrf)# rd 100:1
```

ð ֽ Ô

ֽ	
ip vrf	vrf
show ip vrf	vrf

ð Ô

RGOS10.3(3)Л∪ Э

32.1.5 route-target

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

ꟾ ꟻ vrf rt

ð Ô

import ѝ

32.1.6 ip vrf forwarding

ˆ ˜ ╗ VRF; VRF˝ no

ip vrf forwarding *vrf-name*

no ip vrf forwarding *vrf-name*

ð Ô

vrf-name ' ╗ VRF ˧

ð Ô

Ю˝ a VRF

ð ֽ Ô

ð Ô

╗ VRF

ð Ô

```
Ruijie(config-if)# ip vrf forwarding redvrf
```

ð Ô

RGOS10.1 Л↓Э

32.1.7 show ip vrf

VRF

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

ð Ô

brief ' ˆ ˩ ˜ VRF è

detail ' ˆ ˩ ˜ VRF è

interfaces ' ˆ ˩ ˜ VRF è

vrf-name ' (˩) VRF

ð Ô

˘ VRF

ð ֽ Ô

ð Ô

ֽ VRF ˘ ˩ Л↓ч '

¸ brief

¸ detail

33 RIP

33.1

33.1.1 address-family RIP

RIP ˘ ʒ

address-family˘ ˘ ʒ

no Â

address-family ipv4 vrf *vrf-name*

no address-family ipv4 vrf *vrf-name*

ð Ô

vrf *vrf-name*	ʒ VRF ɻ Â

ð Ô

a RIP Â

ð ʒ Ô

Â

ð Ô

address-family ʒ ˆ ѝ'
(config-router-af)#˜ Â VRF ˘ RIP
VRF RIP Â Ю˘ ɻЛυ VRF RIP
Â

˘

exit-address-family **exit** ʒ Â

ð Ô

ЛυЮ ˘ ɻ ѝ vpn1 VRF˘ ѝ vrf
RIP Â

```
Ruijie(config)# ip vrf vpn1
Ruijie(config-vrf)# exit
Ruijie(config)# interface FastEthernet 1/0
Ruijie(config-if)# ip vrf forwarding vpn1
Ruijie(config-if)# ip address 192.168.1.1
```

```
255.255.255.0
Ruijie(config)# router rip
Ruijie(config-router)# address-family ipv4 vrf vpn1
Ruijie(config-router-af)# network 192.168.1.0
Ruijie(config-router)# exit-address-family
```

ð ৡ Ô

ৡ	
exit-address-family	Â
ip vrf	VRF Â

33.1.2 auto-summary (RIP)

RIP ╠ ╖ ˘ ৡ **auto-summary** Â
ৡ **no** ╠ ╖ Â

auto-summary

no auto-summary

ð Ô

Â

ð Ô

╠ ╖ Â

ð ৡ Ô

Â

ð Ô

RIP ╠ ˘ ˘ ╠
Â RIPv1 RIPv2 Ю ╠ Â

RIP ╠ ╖ ˘ Â
˘ a ˘ ┘ Л
Â

˘ ў ЛЮ '

¸ RIP ˘ ″I '

¸ RIP ˘ ˘ Â

¸ ┘ é ˘ a ┘ Л
˘ ╠ ╖ Â ┘ RIPv2 ˘ ┘ Л
╠ ╖ ˘ RIPv1 ╠ Â

ð Ô

ЛЬЮ ˘ RIPv2 ╟ Â

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

ð ҳ Ô

ҳ	
version	ЮЖ RIP ˚ Â v1 v2 ч ˘ ↓ v1&v2 Â

33.1.3 default-metric (RIP)

ЮЖ RIP ˘ ҳ **default-metric** Â ҳ **no** Â

default-metric *metric*

no default-metric

ð Ô

metric	˘ ù 1 16 Â metric 16˝ RGOS ù a ↓ Â

ð Ô

ù 1 Â

ð ҳ Ô

Â

ð Ô

ҳ б ҳ **redistribute** Â ÿ ∕ ˘ ┼ RIP ˘ a ↓ ⁸ a ˘ Â ˘ ЮЖ ┼ RIP Â ┼ ˘ ЮЖ ˘ RIP default-metric ЮЖ ' ЮЖ ˘ default-metric ЮЖ Â a ҳ default-metric ù 1 Â

ð Ô

ЛЬЮ ˘ RIP OSPF ┼ ˘ ┼ RIP ù 3 Â

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

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

ð ৡ Ô

ৡ	
redistribute	ÿ ⍞ ⅄ Â

33.1.4 default-information originate(RIP)

RIP ˘ ⅃ Л∪ ৡ **default-information originate** ৡ˘ ৡ **no** ⅄ Â

default-information originate [**always**] [**metric** *metric-value*] [**route-map** *map-name*]

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

ð Ô

always	^ ⅃ ~ RIP ˚ ˘ a Â
metric *metric-value*	^ ⅃ ~ ˘ *metric-value* ⅄ ' 1-15 Â
route-map *map-name*	^ ⅃ ~ route-map ⅂ , route-map

ð Ô

, metric ѝ 1 Â

ð ৡ Ô

Â

ð Ô

˘ RIP a ˘ **default-information originate** ৡ ˘ Â

always ˘ RIP a ˘ ˘ a Â ˘ ⅃ Л∪ **show ip rip database** RIP Â

RIP ⁸˘ ⅄ Л∪ **route-map** ˘
' **set metric** Â

⅄ Л∪ **metric** ˘ ″I æ
route-map **set metric** ' **metric** ˘
RIP Â

~

RIP ȝ ˘ ѫ RIP a ″Ą ˉ
Â

ip default-network ˘ ÿ
default-information originate ȝ RIP Â

ð Ô

ЛЬЮ $ ǫ i Â

ð Ô

ѝ 120 Â

ð ৡ Ô

Â

ð Ô

ৡ RIP

ð ȝ Ô

Â

ð Ô

ẏ ˇ ɻ Ɽ ǐ ⁸ ˇ
Â

ˇ Â

ð Ô

ЛЬЮ ˇ RIP ÿ Fastethernet 0/0 ˇ
⁸ ˇ ɻ 172.16 Â

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

ð ȝ Ô

ȝ	
access-list	Ⱨ Â
prefix-list	Ⱨ Â

33.1.7 distribute-list out RIP

⁸ ˇ Ɽ ˇ ȝ
distribute-list out Â ȝ **no** Ⱨ Â

distribute-list {[*access-list-number* | *name*] | **prefix** *prefix-list-name*} **out** [*interface* | *protocol* [*process-id* | *process-name*]]

no distribute-list {[*access-list-number* | *name*] | **prefix** *prefix-list-name*} **out** [*interface* | *protocol* [*process-id*| *process-name*]]

ð Ô

access-list-number	Â ɻ ˇ ɻ Ɽ Â
prefix *prefix-list-name*	Â
interface	(ɻ) ǐ ˇ ⁸ ɻ Â

protocol	(¬) ¦ ˘ ¦ Â
process-id	(¬) *protocol* ¼ OSPF ˘ OSPF id Â
process-name	(¬) *protocol* ¼ ISIS ˘ ISIS ¬ Â

ð Ô

8 Â

ð ¾ Ô

Â

ð Ô

¾ a ¬ ˘ 8 ,
˘ 8 ¬ , è
˘ 8 ¬ Â

ð Ô

ЛЬЮ ˘ RIP ¬ 192.168.12.0/24 Â

```
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
```

ð ¾ Ô

¾	
access-list	Ня Â
prefix-list	Ня Â
redistribute	¦ Â

33.1.8 exit-address-family

˘ Ю **exit-address-family**

¾ Â

exit-address-family

ð Ô

ֽ **no** Â

ð Ô

ֽ ѝ Â

ð ֽ Ô

Â

ð Ô

Ю ֽ Â

ֽ ˩ Л∪ ѝ **exit** Â

ð Ô

Л∪Ю ˘ '

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

ð ֽ Ô

ֽ	
address-family	Â

33.1.9 ip rip authentication key-chain

RIP ˘ RIP ˘ ֽ **ip rip authentication key-chain** Â ֽ **no** Â

ip rip authentication key-chain *name-of-keychain*

no ip rip authentication key-chain

ð Ô

name-of-keychain	˩ ˘ RIP Â

ð Ô

Â

ð ֽ Ô

Â

ð Ô

˘ **key chain** ֽ

Ⱨ a RIP Â

RIPv1 a RIP ˘ ˇ RIPv2 Â

ð Ô

ЛЬЮ ˘ Serial 0 RIP ˘ ŕ ripchain Â

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

ð ֽ Ô

ֽ	
ip rip authentication mode	ЬЖ RIP Â
ip rip authentication text-password	RIP Â
key chain	˘ Â

33.1.10 ip rip authentication mode

ЬЖ RIP

ЛЬЮ ˘ Serial 0 RIP й MD5 Â

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

ð ३ Ô

३	

¾	
ip rip authentication mode	ЊЖ RIP Â
ip rip authentication key-chain	RIP ˘ RIP Â ˇ RIPv2 RIP Â

33.1.12 ip rip default-information

ÿ RIP ˘ ¾ **ip rip default-information** Â ¾ **no** ˇ Â

ip rip default-information¸ **only**¸ **originate**¸ [**metric** *metric-value*]

no ip rip default-information

ð Ô

only	˘ a è Â

ЛЬЮ ˘ ethernet0/0 Э ˘ ↓
Â

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

ð ¾ Ô

¾	
default-information originate	RIP

33.1.13 ip rip receive enable

RIP Э RIP ˘ ¾ **ip rip receive enable** Â ¾ **no** RIP Э RIP Â

ip rip receive enable

no ip rip receive enable

ð Ô

ð Ô

RIP

ð ¾ Ô

Â

ð Ô

RIP ˘ Ю ¾ **no** Â ¾ ¾ Â ↓ ¾ **default** RIP Â

ð Ô

ЛЬЮ ˘ Fastethernet 0/0 RIP Â

```
Ruijie(config)# interface fastethernet 0/0
Ruijie(config-if)# no ip rip receive enable
```

ð ¾ Ô

¾	
ip rip send enable	RIP
passive-interface	RIP ╟

33.1.14 ip rip receive version

Ыѫ RIP Э RIP ˘
ˀ **ip rip receive version** Â ˀ **no** Â

ip rip receive version [**1**] [**2**]

no ip rip receive version

ð Ô

1	ˆ ˩ ˜ ˩ RIPv1 Â
2	ˆ ˩ ˜ ˩ RIPv2 Â

ð Ô

ѝ ˩ ¤ **version** ˀ Â

ð ˀ Ô

Â

ð Ô

ˀ ˘ ˩Л **vesion** ˀ Â ˀ ˩
RIP ѝ˘ ˩Л ˩ RIPv1 RIPv2
Â ˀ a ѝ ˩ ¤ version Â

ð Ô

ЛЬЮ ˘ Fastethernet 0/0 ˩Л RIPv1 RIPv2
Â

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

ˀ	
version	Ыѫ RIP Â

33.1.15 ip rip send enable

RIP Э RIP ˘ ˀ **ip rip send enable** Â ˀ **no** RIP Э RIP Â

ip rip send enable

no ip rip send enable

ð Ô

¦

ð Ô

RIP

ð ¦ Ô

ð Ô

RIP ˘ Ю ¦
no Â ¦ ¦ Â ˩ ¦
default RIP Â

ð Ô

ЛЬЮ ˘ Fastethernet 0/0 RIP Â

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

ð ¦ Ô

¦	
ip rip receive enable	RIP
passive-interface	RIP ╟

33.1.16 ip rip send version

Ћ RIP Э RIP ˘
¦ **ip rip receive version** Â ¦ **no** Â

ip rip send version [**1**] [**2**]

no ip rip send version

ð Ô

1	ˆ ˩ ˜ ˩ RIPv1 Â
2	ˆ ˩ ˜ ˩ RIPv2 Â

ð Ô

и ˩ ¤ **version** ¦ Â

ð ३ Ô

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

ð ¦Ô

¦	
version	ЬЖ RIP Â

33.1.18 ip split-horizon (RIP)

RIP ¦ ╖ ˘ ¦ **ip split-horizon** Â
¦ no RIP ¦ ╖ Â

ip split-horizon

no ip split-horizon

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¦ Â

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ЮЎ ¦ Э Â

ð ¦ Ô

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Л IP Э˘ ˘
¦ ⁸ Л Â ¦ Л Л
ÿ ˉ ˘ и
Â

^ à X.25 ~ ˘ ¦ Л
¦ ˉ a Â ЮЎ Л
¦ Â IP ˘ ≠ ¦ Â

RIP ˘ ¦
Â a ¦ ˘ Л Л **show ip rip**
¦ Â Л **neighbor** ¦ ЬЖ ˘ a Л RIP
¦ Â

ð Ô

ЛЮ ˘ Fastethernet 0/0 RIP ¦ ╖ Â

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

ð ¦Ô

३	
neighbor˄ RIP˜	⊮ RIP

auto-summary	RIP

Ⱡ RIP IP ˘ ⅃ Ⲗ **neighbor** Â
¾ **no** Ⱡ Â

neighbor *ip-address*

no neighbor

ð Ô

ip-address	IP Â Â

ð Ô

Ⱡ Â

ð ¾ Ô

Â

ð Ô

RIPv1 IP ˆ 255.255.255.255˜ ˘ RIPv2
ˆ 224.0.0.9˜ Â a
Э ˘ ⅃ ˘ ⅃ Ⲗ
¾ **passive-interface** ѝ ╟ ˘ ⅄ ⅃ Ⱡ
⅃ Ⲗ Â ¾ a RIP Â
passive ˘ ⅄ ≠ a Â

33.1.22 offset-list(RIP)

╕ RIP metric ˘ ⅃ Ⲗ ¾
offset-list ¾ **no** offset

offset-list access-list-number {**in** | **out**} *offset* [*interface-type interface-number]*

no offset-list access-list-number {**in** | **out**} *offset* [*interface-type interface-number*]

ð Ô

interface-number	ภ

ð Ô

offset Â

ð ३ Ô

Â

ð Ô

RIP ﻉ offset-list ภ
offset-list RIP ╗ offset-list metric

ð Ô

ภ ˇ acl 7 RIP metric ╗ 7 Â

```
Ruijie(config-router)# offset-list 7 out 7
```

ภ ˇ fastEthernet1/0 ˙ acl 8
RIP metric ╗ 7 Â

```
Ruijie(config-router)# offset-list 7 in 7
Ruijie(config-router)# offset-list 8 in 7 fastEthernet
1/0
```

33.1.23 output-delay

ﻝ

Ю˘ RIP й 512 ˘ ˩Л 25 ˘
25˘ ˘ Ю
˩ Â

˘ æ ˘ æ ˩ a
˘ Â ˘ **output-delay**
ʒ ╗ ˘ æ
Â

ð Ô

ЛЮ ˘ RIP й 30

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

33.1.24 passive-interface

˩ Э ╗ ˘ ʒ
passive-interface ʒ Â ʒ **no** ╗
Â

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

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

ð Ô

default	й passive
interface-type interface-num	б Л

ð Ô

Ю˘ й passive Â

ð ʒ Ô

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ð Ô

passive-interface default ʒ й passive ˘ ˩ Л **no passive-interface** *intface-type interface-num* ʒ й passive Â

ip rip send enable ʒ **ip rip receive enable** ʒ й RIP Ю˘ ʒ й passive ˘ a ¨Ą RIP ˘ ˩Л RIP ’ ˘ **ip rip send enable** ʒ **ip rip receive enable** ʒ [8] Â

ð Ô

ЛЪЮ й passive ˘ Л ethernet0/0 й passive

```
Ruijie(config-router)# passive-interface default
Ruijie(config-router)# no passive-interface ethernet 0/0
```

ð ¾Ô

¾	
ip rip receive enable	RIP
ip rip send enable	RIP

ð Л Ô

33.1.25 redistribute RIP

† ˘ **redistribute** ¾Â Л † ˘ ¾ **no** Â

redistribute {**bgp** | **isis** [*process-name*] |**ospf** *<1-65535>* | **connected** | **static**}[**metric** *value*] [**route-map** *route-map-name*][**match internal** | **external** *type* | **nssa-external** *type*]

no redistribute {**bgp** | **isis** [*process-name*] |**ospf** *<1-65535>* | **connected** | **static**}[**metric** *value*] [**route-map** *route-map-name*] [**match internal** | **external** *type* | **nssa-external** *type*]

ð Ô

bgp	**isis**	**ospf**	**connected**	**static**	†
metric	† metric
route-map	†
match	† ospf
process-name	ISIS Л
<1-65535>	OSPF Л

ð Ô

Ю˘

ʈ OSPF ʈ ’

ʈ ISIS ʈ level-2 ’

è Ю ʈ ’

ʈ ʌ metric ѝ 1’

a route-map Â

ð ʒ Ô

ð Ô

ʒ ʈ RIP Â

ʈ ˘ ʌ

˘ ѝ a ʌ a ʌ ÂRIP

˘ OSPF Ò ʌ ʈ

Â

ð Ô

flush	˘ Л υ ˘ ÿ RIP *invalid* Â *flush* ˘ *invalid* Â *Flush* ѝ 120 Â

ð Ô

ЮЎ ѝ 30 ˘ ѝ 180 ˘ ѝ 120 Â

ð ֽ Ô

Â

ð Ô

Л Э ˘ ˩ ╗ Л υ Â
˩ Э ˘ RIP Â a RIP
˘ Â

RIP ˘ ˩ Л υ **show ip rip** ֽ Â

ð Ô

ЛυЮ ˘ RIP 10 Â 30
˘ ˩ ѝ ˘ invalid ’
invalid Л˘ 90 ˘ Â

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

~

æ Э ˘ ˘ ѝ
Â ˩ Л υ 2Mbps Л υ Э ˘ ˩ Л υ
˘ ˩ Л υ Â

33.1.28 validate-update-source

RIP ˘ ˘
ֽ **validate-update-source** Â ֽ **no**
Â

validate-update-source

no validate-update-source

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ન Ո RIP ˘ Â ѝ

RIP ˘ ન ન IP ب ھ ò

ɻ Л∪ RIPv1 RIPv2 ˇ ɻ RIPv1
Â

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ð Ô

Ⱶ RIP Л Â ɻ Л∪ **ip rip receive version** à
ip rip send version ʒˇ RIP
Ⱶ Â

ð Ô

Л∪Ю ˇ RIP Л й 2 Â

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

ð ʒ Ô

ð Ô

ɻ RIP Ь à ǀ à ǀ
à rip à rip б à metric б distance Â
VRF VRF ɻ VRF-id

ð Ô

ЛЬЮ ˘ RIP ˘ à
Â

```
Ruijie# show ip rip
Routing Protocol is "rip"
Sending updates every 10 seconds, next due in 4 seconds
Invalid after 20 seconds, flushed after 10 seconds
```

33.2.2 show ip rip database

RIP ˘ **show ip rip database** Â

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

ð Ô

vrf *vrf-name*	ˆ ˩ ˜ VRF RIP
network-number	ˆ ˩ ˜ ⁄ı Â
network-mask	Â ⁄ı ˘

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˘ RIP
Â ⁄ ˩ ѝ ˘
≠ ÿ Â

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ЛЪЮ ˘ RIP Â

```
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
```

ЛЪЮ ˘ RIP 192.168.121.0/24
Â

```
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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show ip rip	Â

33.2.3 show ip rip external

RIP ¦ ˘ **show ip rip external** ¾ Â

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

ð Ô

**bgp	connected	isis	ospf	static**	^ ˩ ~ ¦
vrf *vrf-name*	^ ˩ ~ VRF RIP
process-name	ISIS ˩
<1-65535>	OSPF /ı

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à à Â

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ЛЪЮ ˘ RIP ¦ Â

```
Ruijie# show ip rip external connected
Protocol connected route:
[connected] 1.0.0.0/8 metric=0
nhop=0.0.0.0, if=2
[connected] 3.0.0.0/8 metric=0
nhop=0.0.0.0, if=16391
[connected] 4.4.0.0/16 metric=0
nhop=0.0.0.0, if=16388
[connected] 5.0.0.0/8 metric=0
nhop=0.0.0.0, if=16386
[connected] 192.168.195.0/24 metric=0
nhop=0.0.0.0, if=1
```

ð ¾Ô

३	
show ip rip	Â

33.2.4 show ip rip interface

RIP ˘ **show ip rip interface** Â

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

ð Ô

vrf *vrf-name*	ˆ ˩ ˜ VRF RIP

ð Ô

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ЛЬЮ ˘ RIP Â

```
Ruijie# show ip rip interface
FastEthernet 1/1 is down, line protocol is down
  RIP is not enabled on this interface
FastEthernet 1/0 is up, line protocol is up
  Routing Protocol: RIP
  Receive RIPv2 packets only
  Send RIPv2 packets only
  Passive interface: Disabled
  Split horizon: Enabled
  V2 Broadcast: Disabled
  Multicast register: Registed
  Interface Summary Rip:
    Not Configured
  Authentication mode: Text
  Authentication key-chain: ripk1
  Authentication text-password: ruijie
  Default-information: only, metric 5
  IP interface address:
    192.168.64.100/24
```

RIP б BFD ╠, ж ३ 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: Registed
    Interface Summary Rip:
      Not Configured
    IP interface address:
2.2.2.111/24
```

ð Ô

ЛЬЮ ˇ RIP Â

```
Ruijie#
```

34 OSPF

34.1

34.1.1 area

ш ˘ ٪ **no** OSPF ш Â

area area-id

no area area-id

ð Ô

¸	¸
¸ area-id	¸ OSPF ш /ı Â ш /ı ⊿ Л ⁸ ˘ ≠ ⊿ Л IP Â

ð Ô

OSPF ш Â

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ð Ô

⊿ Л ٪ **no** ˘ OSPF ш ш ˘ **area authentication** à**area default-cost** à**area filter-list** à **area nssa** ш ٪ Â

Ю Ю˘ OSPF ш '

1. ў ш ˘ Â ″l ˘ ў ш Â
2. ш ˘ **network area** ٪ Â ″l ╕ ш ٪˘ ш Â

ð Ô

ЛЬЮ ˘ OSPF ш 2 '

```
Ruijie(config)# router ospf 2
Ruijie(config)# no area 2
```

ð ˙ Ô

¸ ˙	¸
¸ **network area**	¸ Ĥ OSPF˜ Л∪ OSPF ш

34.1.2 area authentication

OSPF ш ˘ ˙ **area authentication** Â ˙ **no** OSPF ш Â

area *area-id* **authentication** [**message-digest**]

no area *area-id* **authentication**

ð Ô

¸	¸
¸ area-id	¸ OSPF ш Л Â ш Л Л∪ 8 ˘ ≠ Л∪ IP Â
¸ message-digest	¸ ^ Л ˜ MD5ˆ message digest 5˜ Â

ð Ô

Â

ð ˙ Ô

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ð Ô

RGOS ˚ Л∪ Ь ' ˝ ˜ ˚ ˘ a ˘ ˙ OSPF ˘ OSPF й˚ ' ˘ ˜ ˝ ˘ й ˘ ˙ **message-digest** ' ' ˜ ˘ ˘ й MD5 ˘ ˙ **message-digest** Â

OSPF ш ˘ Л Â ˘ ˙ Â ˙ **ip ospf authentication-key** Л∪ ˙' ˙ **ip ospf message-digest-key** Л∪ MD5 ˙ Â

ð Ô

ЛЬЮ ˘ OSPF ш 0́ ш ˜ MD5 ˘
¾ и backbone Â

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

OSPF

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

ð ¾Ô

¸ ¾	¸
¸ ip ospf authentication-key	¸ ЬЖ OSPF ¾ Â

cost	STUB ш NSSA Â

ð Ô

ий Â

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Â

ð Ô

ʒ л ABR ш ~ Э ˘ з ABR STUB ш ^ ий ~ NSSA Â ABR ˘ ш ˘ л ш Â

OSPF ш ий STUB NSSA ч Ь ʒ **area stub** ˘ **area nssa** **area default-cost** Â STUB Э˘ **area stub** ʒ˘ NSSA ш **area nssa** ʒ˘ **area default-cost** ʒ л ABR Э Â

ð Ô

ЛЬЮ ʒ˘ ий 50 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
```

ð ʒ Ô

¸ ʒ	¸
¸ **area stub**	¸ OSPF ш ий Â
¸ **area nssa**	¸ OSPF ш ий NSSA ш

ð л Ô

ð Ô

34.1.4 area filter-list

ABR Э ˘ a л ш intra-area ¨ 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**]

ð Ô

area-id	ש ת Â

acl-name

OSPF ш ѝ nssaў ȝ **area nssa** Â
ȝ **no** nssa ш nssa ш Â

area *area-id* **nssa** [**no-redistribution**] [**default-information-originate** [**metric** <*0-16777214*> | **metric-type** <*1-2*>]] [**no-summary**]

no area *area-id* **nssa** [**no-redistribution**][**default-information-originate**] [**no-summary**]

ð Ô

¸	¸
¸ **area-id**	¸ NSSA ш ш Л Â
¸ **no-redistribution**	¸ ^ Ы ~ nssa ABR ˘ Ы Ї ȝ ш a nssa ш ˘ Ы Л Э Â
¸ **default-information-originate**	¸ ^ Ы ~ 7 LSA nssa ш ˘ Ы NSSA ABR ASBR Э Â
¸ **no-summary**	¸ ^ Ы ~ nssa (ABR) Ь LSA nssa ш Â

ð Ô

Ѭ NSSA ш Â

ð ȝ Ô

Â

ð Ô

default-information-originate Type-7 LSAў nssa ABR ASBR Э ˘ ABR Э ˘ Type-7 LSA ˘

ѝ NSSA ѫ ˆ LSA˜ ˘
ㄴЛ ABR Э no-sµmmary ˘ ABR NSSA ѫ
summary LSAsˆ Type-3 LSA˜ Â

ㄱ **area default-cost** NSSA ѫ ABR

ip-address	Ѭ Â
advertise | **not-advertise**	Ѭ Ὼ ˘ Ὼ
cost *cost*	Â

ð Ô

ш Â

б RFC1583 ˘
RFC1583 ˘ cost ˘
cost Â

ð ʒ Ô

Â

ð Ô

ʒ ˩ ABR Э ˘ ш
˘ ˥ è ш Â й ˩ ш
˘ ш Э é ˘ ш ˩
Â з ˩ Л advertise not-advertise

ᾱ Ὼ ˘ ˘ Ὼ Â

˩ Л Ѭ ш ʒ˘ OSPF
˘ ˘ Â

ð Ô

ЛЬЮ ˘ ш ˝ 172.16.16.0/20 Â

```
Ruijie(config)# router ospf 1
Ruijie(config-router)# network 172.16.0.0 0.0.15.255
area 0
Ruijie(config-router)# network 172.16.17.0 0.0.15.255
area 1
Ruijie(config-router)# area 1 range 172.16.16.0 255.2
55.240.0
```

ð ˥ Ô

ð Ô

34.1.7 area stub

OSPF ש ִ ˘ ֽ
area stub Â ֽ **no** Â

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

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

ð Ô

area-id	STUB ש ש ׀ Â
no-summary	ˆ ׀ ˜ ABR ˘ ׀ ִ Â׀ ABR Â

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ﬗ Â

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ð Ô

OSPF **area stub** ֽ Â ABR ׀
Ь

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

ð ¾Ô

authentication-key *key*	ˆ ˩ ˜ Ⱶ OSPF Â Â service password-encryption ҳ ˩ Л Л╗ Â
message-digest-key *key-id* **md5** *key*	ˆ ˩ ˜ Ⱶ OSPF MD5 Â MD5 Â service password-encryption ҳ ˩ Л Л╗ Â
authentication	˘ Â
message-digest	ѝ MD5 Â
null	ѝ a Â

ð Ô

dead-interval ' 40 ’

hello-interval ' 10 ’

retransmit-interval ' 5 ’

transmit-delay ' 1 ’

a ;

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OSPF ˘ ш б ˘ ˘ ˘ Â

ч ш ˆ ABR˜ ˘ ч ABR ˩ ш ѝ ш Â ˆ Stub Area˜ NSSA a ѝ ш Â ≠ ˩ Л è ш Â

router-id ѝ OSPF ˘ a router-id ˘ **show ip ospf neighbor** ҳ Â˩ Л Loopback Â

area virtual-link ҳ ˩ Ⱶ ˘ ш OSPF ˘ ҳ **area authentication** Â

ð Ô

ЛЮ ˘ Л ш 1 ѝ ш ˘ б 2.2.2.2 Â

```
Ruijie(config)# router ospf 1
Ruijie(config-router)# network 172.16.0.0 0.0.15.255 area 0
Ruijie(config-router)# network 172.16.17.0 0.0.15.255area 1
       Ruijie(config-router)# area 1 virtual-link 2.2.2.2
```

```
Ruijie(config)# router ospf 1
Ruijie(config-router)# network 172.16.17.0 0.0.15.255area 1
Ruijie(config-router)#
```

```
Ruijie(config-router)# no commpatible rfc1583
```

ð ३ Ô

३	
show ip ospf	ospf

ð ⁄ Ô

ð Ô

34.1.12 default-information originate OSPF

OSPF ˘ ३

default-information originate Â ३ **no** Â

default-information originate [**always**] [**metric** *metric*] [**metric-type** *type*] [**route-map** *map-name*]

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

ð Ô

always	ˆ ˩ ~ OSPF ˚ ˘ a Â
metric *metric*	ˆ ˩ ~ ˘ и 1 Â
metric-type *type*	ˆ ˩ ~ ÂOSPF ч ' 1˘ a ˩ Э a ' 2˘ Â 1 2 ˩ Â и 2 Â
route-map *map-name*	route-map ˩ , route-map

ð Ô

a Â

ð ३ Ô

Â

ð Ô

redistribute **default-information** ⅋ ˘ OSPF
╟ ⅃ и ASBR˘ ˜ Â ASBR a ╟
˘ OSPF ÂASBR
˘ **default-information originate** ⅋
Â

always ˘ OSPF a ˘
Â a ˘
˘ ⅃Л **show ip ospf database** OSPF
˘ и 0.0.0.0 ÂOSPF
show ip route ⅋˘ ⅃Л Â

˘ ⅄ **default-information originate**
⅋ Ⅎ˘ a ⅋ **default-metric** Â

OSPF ч ˘ 1 ⅄˘ 2
a ⅃ Â ч ˘ ⅄
˘ 1 2 ˝I ˘ Л **show ip route** ⅄
1 Â

STUB ш a ⅃Л Â

ð Ô

ЛЬЮ ˘ OSPF ˘ OSPF
˘ и 1˘ и 50 Â

```
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
```

ð ⅋ Ô

⅋	
show ip ospf database	OSPF Â
show ip route	IP Â

ð ⅄ Ô

ð Ô

34.1.13 default-metric

OSPF ↑ ˘ ⅋
default-metric Â ⅋ **no** Â

default-metric *metric*

no default-metric

ð Ô

metric	ЊЖ OSPF ↑ Â

ð Ô

ы 20 Â

ð ֽ Ô

Â

ð Ô

default-metric ֽ б **redistribute** ֽ ˘ ┘ Л∪ ↑ Â

default-metric ֽ ˘ Л∪ **default-information originate** OSPF a Â

ð Ô

ЛЮ ˘ OSPF ↑ ы 50 Â

```
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
```

ð ֽ Ô

ֽ	
redistribute	↑ è Â
show ip ospf	ospf

ð ┘ Ô

ð Ô

34.1.14 distance ospf

a ؍ OSPF

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

no distance ospf

ð Ô

intra-area <*1-255*>	ш ˘ ѝ 110
inter-area <*1-255*>	ш ˘ ѝ 110
external <*1-255*>	˘ ѝ 110

ð Ô

ѝ 110 Â

ð ֳ Ô

OSPF Â

ð Ô

OSPF a ؍ a ؍ ˘ ֳ Â

ð Ô

ЛЬЮ ˘ OSPF ѝ 160

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

ð ֳ Ô

ð ؍ Ô

ð Ô

34.1.15 distribute-list in

LSA

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

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

ð Ô

listname	acl
gateway *plist-name*	gateway
prefix *plist-name*	prefix-list
interface-type *num*	¬ LSA

ð Ô

ы ˘ Â

ð ¾ Ô

Â

ð Ô

LSA ˘ ° б SPF ˘
Â a ˘ ≠ a
˘ ¬ OSPF Â ╖ ABR
ASBR˘ ¬ Л∪ ⁸ Â

ð Ô

```
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
```

ð ¾ Ô

ð ¬ Ô

ð Ô

34.1.16 distribute-list out

ƒ ˘ ╖ **redistribute** ¾

distribute-list {*listname* | **gateway** *plist-name* | **prefix** *plist-name*}

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

ð Ô

listname	acl
gateway *plist-name*	gateway
prefix *plist-name*	prefix-list

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

OSPFv2 16 TRAP ˘ ˦ ѝ 4 ˘ Ю
ʒ ˩ Л∪ ╟ TRAP Â ʒ **no** ˩ Л∪
TRAP Â

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

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

ð Ô

	error	б error traps ˇ ⅃ Л Ю error traps ' **ifauthfailure** **ifconfigerror** **ifrxbadpacket** **virtifauthfailu re** **virtifconfigerr or** **virtifrxbadpac ket**

		б lsa traps ˘ ⅃ Л Ʊ Ю lsa traps '	
		lsdbapproach **overflow**	
		lsdboverflow	
		maxagelsa **originatelsa**	
	lsa		L

retransmit	б retransmit traps ˘ ⅃ Л Ю retransmit traps ' **iftxretransmit** **virtiftxretrans mit**

state-change	б state-change traps ˘ ˩ Л Ю state-change traps ' **ifstatechange** **nbrstatechange** **virtifstatechange** **virtnbrstatechange**

ð Ô

Ю˝ TRAP Â

ð ʒ Ô

Â

ð Ô

ʒ ˩ **snmp-server** ʒ ⁸˘ ˝I **snmp-server enable traps ospf** Л ˥˘ ʒ ˩ Л Â

ʒ a ˩ MIB ⁸˘ a ˩ ˩ TRAP Â

ð Ô

ЛЬЮ ˘ OSPFv2 100 TRAP '

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

ð ¾Ô

¾	
show ip ospf	OSPF
enable mib-binding	OSPFv2 MIB

ð ⁄ Ô

ð Ô

34.1.19

ЛЬЮ ˘ FastEthernet 0/0 OSPF ѝ MD5
Â

```
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
```

ð ¾Ô

¾	
area authentication	OSPF ѡ ЊЖ Â
ip ospf authentication-key	OSPF Â
ip ospf message-digest-key	OSPF MD5 Â

ð ⁄ Ô

ð Ô

34.1.20 ip ospf authentication-key

OSPF ˘ ¾ **ip ospf authentication-key** Â ¾ **no** Â

ip ospf authentication-key *key*

no ip ospf authentication-key

ð Ô

Key	˘ ⁄Л 8 Â

ð Ô

Â

ð ¾ Ô

Â

ð Ô

ip ospf authentication-key ¾ ˘ OSPF Â
a ˘ ч ⁄ a OSPF ˘
≠ a Â

OSPF

ð ৡ Ô

Â

ð Ô

ЮЎ OSPF ьй 100Mbps/BandwidthЎ è Bandwidth
ьй ˇ ৡ bandwidth Â

ђ OSPF ьй'

¸ 64K ˇ cost ьй 1562'

¸ E1 ˇ cost ьй 48'

¸ 10M Лъ ˇ cost ьй 10'

¸ 100M Лъ ˇ cost ьґ Â

ip ospf cost ৡ OSPF ˇ Â

ð Ô

ЛъЮ ˇ serial 1/0 OSPF ьй 100 Â

```
Ruijie(config)# interface serial 1/0
Ruijie(config-if)# ip ospf cost 100
```

ð ৡ Ô

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ð Ô

ד , ֿ Л Э LSA Â

ð ֽ Ô

Â

ð Ô

Э LSA , ֿ Л Э ד

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ð Ô

ЛЬЮ ˘ LSA serial 1/0 Э Â

```
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
```

ð ֿ Ô

ð Ô

34.1.23 ip ospf dead-interval

OSPF ˘ ֽ **ip ospf dead-interval** Â ֽ **no** Â

ip ospf dead-interval *seconds*

no ip ospf dead-interval

ð Ô

seconds	Ьא ˘ Л ù æ Â

ð Ô

ù **ip ospf hello-interval** " Â

ð ֽ Ô

Â

ð Ô

OSPF Hello Â OSPF ˘
Hello ˘ ÿ
Â ù hello 4 ˘ hello
˘ ╟ Â

ȝ ↓ Л∪ OSPF ˘ ↑ Â
ч '

¸ ˘ a hello '

¸ ↓ Э Â

ð Ô

ЛЬЮ ˘ serial 1/0 OSPF ù
30 Â

```
Ruijie(config)# interface serial 1/0
Ruijie(config-if)# ip address 172.16.10.1
255.255.255.0
Ruijie(config-if)# encapsulation ppp
Ruijie(config-if)# ip ospf dead-interval 30
```

ð ȝ Ô

ȝ	
ip ospf hello-interval	OSPF Hello Â

ð ↓ Ô

ð Ô

34.1.24 ip ospf disable all

a Ą ospf Â

ip ospf disable all

no ip ospf disable all

ð Ô

ȝ

ð Ô

ð ȝ Ô

Â

ð Ô

¾ **network area**

ð Ô

ЛъЮ ˘ serial 1/0 OSPF Hello ѝ 15 Â

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

ð ¾ Ô

¾	
ip ospf dead-interval	OSPF Â

ð ¼ Ô

ð Ô

34.1.26 ip ospf message-digest-key

OSPF MD5 ˘ ¾ **ip ospf message-digest-key** Â ¾ no OSPF MD5 Â

ip ospf message-digest-key *key-id* **md5** *key*

no ip ospf message-digest-key

ð Ô

Key	˘ ¼Лъ 16 Â
Key-id	˘ ÿ˝ 255 Â

ð Ô

MD5 Â

ð ¾ Ô

Â

ð Ô

ip ospf message-digest-key ֽ ˘ OSPF
Â a ˘ ч ⅄ a OSPF
˘ ≠ a Â

a ⅄ ⅄Л a ˘ ⅄ Э
˘ Â ⅄
Â

OSPF ѡ ˘ ֽ **area**
authentication Â Э ≠ ⅄Л ,
Ю ֽ **ip ospf authentication** , ѡ
˝I ⅄ .

RGOS ˚ MD5 ˘ ˝I ╗
⅄ Â ╗ OSPF MD5 ˘
ѝ è ˘ ⍭ a ⅄
OSPF ˘ Â
⅄˘ ⅄Л Â

ð Ô

ЛЮЮ ˘ FastEthernet 0/0 ╗ OSPF ˘
⅄ ѝ˜ ˘ ѝ hello5 Â

```
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
```

╗ ⅄˘ Â

```
Ruijie(config)# interface Serial1/0
Ruijie(config-if)# no ip ospf message-digest-key 10 md5
hello10
```

ð ֽ Ô

ֽ	
area authentication	OSPF ѡ Ⱨ Â
ip ospf authentication	Э Ⱨ

ð ⅄ Ô

ð Ô

34.1.27 ip ospf mtu-ignore

Ø **mtu** ¬Л¦ ¾ Â

¾ **no** Â

ip ospf mtu-ignore

no ip ospf mtu-ignore

ð Ô

¾	

ð Ô

mtu Â

ð ¾ Ô

Â

ð Ô

OSPF MTU
MTU ¬, MTU
MTU, æ a , ¬Л¦ MTU
¤ Â

ð Ô

ЛЦЮ ˇ serial 1/0 MTU ¶ Â

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

ð Ø Ô

ð Ô

34.1.28 ip ospf network

OSPF ˇ ¾ **ip ospf network** Â ¾ **no** Â

ip ospf network¸ broadcast ¸ non-broadcast ¸ point-to-multipoint [**non-broadcast**]¸ **point-to-point**

ð Ô

broadcast	OSPF ù Â
non-broadcast	OSPF ù ˘ NBMA Â
point-to-multipoint [**non-broadcast**]	OSPF ù Â , non-broadcast ù Â
point-to-point	OSPF ù Â

ð Ô

¸ ' PPP à SLIP à à X.25 ,

¸ NBMA ' ^ ~ à X.25 ^ ~ ,

¸ ' Л ,

¸ ù Â

ð ʒ Ô

Â

ð Ô

a ˩ ˘ OSPF ǂ ù Ь '

¸ ^ Л ˘ ʒ ˘ FDDI˜

¸ ^ ˘ X.25˜

¸ ^ HDLC˜ PPP˜ SLIP˜

è ˘ OSPF a ˩ ǂ ù ч '

¸ (NBMA) ÂNBMA ˘ ˩ ˘ SVC ^ X.25˜ ˘ PVC˜ ~ ÂOSPF NBMA Э б Э ˘ ^ Designated Router˜ ˘ NBMA Â

¸ Â a ˘ OSPF Â ˘ OSPF ˘ Л Â ǂ ù ,

.

a ж˘ ⅃Л∪ ѝ Â ⅃Л∪
ˆ ˘ X.25˜ ˘ OSPF
˘ Â **X.25 map**
frame-relay map ʒ˘ ⅃Л∪ X.25 έ ˘
OSPF ⅃Л∪ X.25 Â

⅃Л∪ ˘ OSPF
˘ ў Â б
ЛЬЮ '

¸ ˘ a ˘ ≠ ,

¸ Ʒ˙ ˘ a Â

/ı à Л∪ X.25 ˘ IP ˘
broadcast .

ð Ô

ЛЬЮ ˘ ѝ ˘
Â

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

ЛЬЮ ˘ ѝ ˘
Â

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

ЛЬЮ ˘ ѝ ˘ DR/RDR˜
˛ ÂЛЬЮ ˚
a Э ˆ ⁸ ѝ DR/BDR˜ Â

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

ð ʒ Ô

ʒ	

ð Ô

ЛЬЮ ˘ fastethernet 0/0 ˮI й 0 Â

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

ð ʒ Ô

ʒ	
ip ospf network	OSPF Â

ð ⊿ Ô

ð Ô

34.1.30 ip ospf retransmit-interval

Ьѫ LSU˙ ˜ ˘
ʒ **ip ospf retransmit-interval** Â ʒ **no** Â

ip ospf retransmit-interval *seconds*

no ip ospf retransmit-interval

ð Ô

Seconds	LSU ˘ Лъ й æ Â ч Â й 5 Â

ð Ô

й 5 Â

ð ʒ Ô

Â

ð Ô

LSU ˘ LSU ă ˘
ip ospf retransmit-interval ʒ Ьѫ ˘
˘ LSA Â

˘ Лъ a ˘ Э˘
⊿ Лъ Â LSU area
virtual-link ʒ retransmit-interval Ьѫ Â

ð Ô

ЛЪЮ ˘ serial 1/0 LSU ù 10 Â

```
Ruijie(config)# interface serial 1/0
Ruijie(config-if)# ip ospf retransmit-interval 10
```

ð ¯ Ô

¯	
area virtual-link	ЮЖ OSPF Â

ð ¼ Ô

ð Ô

34.1.31 ip ospf transmit delay

ЮЖ OSPF LSU ˘ ¯ **ip ospf transmit delay** Â ¯ **no** Â

ip ospf transmit delay *seconds*

no ip ospf transmit delay

ð Ô

Seconds	ЮЖ OSPF LSU ˘ Л ù æ Â ù 1 Â

ð Ô

ù 1 Â

ð ¯ Ô

Â

ð Ô

LSU ˘ LSAs˜ ~ Age ╗˘ ╗ ¯ **ip ospf transmit delay** ЮЖ Â ˘ æ ˘ Â LSU ˘ **area virtual-link** ¯ **retransmit-interval** ЮЖ Â

RGOS ˚ Age 3600 LSA˘ ˘ ⁹ ˘ LSA ÿ Â

ð Ô

ЛЪЮ ˘ serial1/ 0 ѝ 5 Â

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

ð ¾ Ô

¾	
area virtual-link	ЮЖ OSPF Â

ð ⁄ Ô

ð Ô

34.1.32 log-adj-changes

¾ ˩ ˘ ¾ **no default** ˩ЛЪ ╖ Â

log-adj-changes [**detail**]

no log-adj-changes [**detail**]

ð Ô

detail	˩

ð Ô

╖ ˘ a **detail** ˘ ⁄ Full Full Â

ð ¾ Ô

Â

ð Ô

ЛЪЮ ˘ ˩ Â

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

ð ¾ Ô

¾	

show ip ospf	ospf Â

ð ✓ Ô

ð Ô

34.1.33 max-concurrent-dd

✓ DD Â

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

>

ð Ô

	1-65612Tc 2 TrC47Fj.327174.51 B1-2 5

cost]

no neighbor *ip-address*

ð Ô

ip-address	IP Â
poll-interval *seconds*	ˆ ˩ ˜ ˘ Л∪ ѝ Æ˘ 120 ÂNon-broadcast(NBMA) Â
priority *priority*	ˆ ˩ ˜ ˝I ˘ ѝ˚ Â Non-broadcast(NBMA)
Cost *cost*	ˆ ˩ ˜ ˘ Ћ, Э cost Âpoint-to-multipoi nt [non-broadcast] Â

ð Ô

Ћ Â

ð ʒ Ô

Â

ð Ô

RGOS ˝ ѝ ˘ Â
IP ˘ ѝ ў IP Â

NBMA Э ˩ ѝ a ˘
Hello ˘ OSPF Hello ˘ Hello
ѝ Â OSPF ˘ ˩ ˝I
a ѝ 0 Hello ˘ ˝I ѝ 0 a
б DR/BDR Â DR/BDR Л∪ ˥˘ DR/BDR
Hello Â

Э, ѝ a έ Л∪ ╠
, ʒ ѝ è , ˥
˩ Л∪ cost .

ð Ô

ЛЮ ˘ OSPF ˘ è IP ѝ
172.16.24.2˝ ˝I ѝ 1˘ ѝ 150 Â

```
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
```

ð ৡ Ô

ৡ

¬ б OSPF **network** ¦ ЮЖ IP ¬
˘ ¬ ˘ б OSPF Â

ð Ô

ЛЬЮ ˘ ЮЖ ' ш ' 0˝ 1˘ 172.16.16.0 Â IP
192.168.12.0/24 ЮЖ ш 1˘ IP
172.16.16.0/20 ЮЖ ш 172.16.16.0˝ è ЮЖ
ш 0 Â

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

ð ¦ Ô

¦	
router ospf	OSPF Â

ð ¬ Ô

ð Ô

34.1.36 overflow database

¦ OSPF LSA Â

overflow database <*0-4294967294*> **hard** | **soft**

no overflow database

ð Ô

<*1-4294967294*>	LSA
hard	**soft**	hard˝ LSA ˘ OSPF ' soft˝ LSA ˘ Â

ð Ô

ð ¦ Ô

Â

ð Ô

OSPF ˘ **hard** ˘ a OSPF˘
ˬ ˘ **soft**

ð Ô

ЛЬЮ ¾ LSA 10 ˘ OSPF 10 Â

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

ð ¾Ô

ð ˬ Ô

ð Ô

34.1.37 overflow database external

¾ external LSA б ÿ
Â

overflow database external *max-dbsize wait-time*

no overflow database external

ð Ô

max-dbsize	external lsa ˆ ˬ AS ˬ˜ ˘ ˬ ' 0-2147483647 Â
wait-time	ÿ ˘ ˬ ' 0-65535 Â

ð Ô

a ⁸ external-LSA Â

⁸ external-LSA ˘ external-LSA
ˬ˘ a Ą Â

ð ¾ Ô

Â

ð Ô

ð Ô

external-LSA *max-dbsize* ˘ ˘
ЮЎ a ЇĄ╖ external-LSAЎ external-LSA Â
wait-time ⁄ˇ ˘ ╖ external-LSA Â

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

ð ٪Ô

ð ⁄Ì Ô

ð Ô

34.1.38 overflow memory-lack

٪ a OSPF OVERFLOW Â ٪
no ╖ Â
overflow memory-lack

no overflow memory-lack

ð Ô

no	a OSPF OVERFLOW ╖ Â

ð Ô

a ЮO OSPF OVERFLOW Â

ð ٪ Ô

Â

ð Ô

OSPF OVERFLOW ў ˘ и
a ЇĄ Â

╖ ˘ OSPF OVERFLOW ˘
┘ Â и ˘
OSPF NULL ˘ ÿ æ
˘ OVERFLOW ЮO Â

ֿ Л **clear ip ospf process** ֽ Æ OSPF ˘
OSPF OVERFLOW Â

no a OSPF a OVERFLOW ˘ ֿ
˘ ˘ OSPF
˘ Â

ð Ô

OSPF a Ю a OVERFLOW '

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

ð ֽ Ô

ֽ	
clear ip ospf process	OSPF Æ
show ip protocols ospf	OSPF

ð ֿ Ô

ð Ô

34.1.39 passive-interface

ֽ ù ╟ Â
ֽ **no** Â

passive-interface [**default** | *type number*]

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

ð Ô

type number	ù ╟ Â
default	ù ╟ Â

ð Ô

Ю ù ╟ , OSPF

ð ֽ Ô

Â

ð Ô

ὶ è ╟ ˜ ˘ ˩ Л∪
ὶ ╟ Â

ð Ô

ЛЬЮ ˘ serial 1/0 ὶ ╟ Â

Ruijie(config-router)# **redistribute isis** *isis-001 level-1*

Show run ÞÒ'

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

ð ¾Ô

ð ¼ Ô

ð Ô

34.1.41 router ospf

OSPF ˘ ¾ **router ospf** Â ¾ **no** ÞÆ OSPF Â

router ospf *process-id* [**vrf** *vrf-name*]

no router ospf *process-id*

ð Ô

process-id	ospf ¼
vrf-name	VRF ˘ OSPF VRF

ʒ	
show ip protocols	Â

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34.1.43 summary-address

OSPF ˘ ʒ
summary-address Â ʒ **no** ЊЋ Â

summary-address *ip-address net-mask* [**not-advertise | tag** *<0-4294967295>* |]

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ip-address	IP Â
net-mask	Â
not-advertise	a Ὼ ˘ ὴ Ὼ Â

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ÿ è ƚ ˘ OSPF ˘
ƚ Л OSPF Â
˘ ⊀ Л ⊀
˘ ÿ Â

б **area rang** ʒ a ⊀˘ area range OSPF ш ˘
summary-address OSPF Â

NSSA ш˘ **summary-address** ʒ ⊀ NSSA ABR Э
˘ з ⊀ ƚ Â

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ЛЬЮ ʒ˘ 100.100.0.0/16 Â

```
redRuijie(config)# router ospf 20
```

```
Ruijie(config-router)# summary-address 100.100.0.0
255.255.0.0
Ruijie(config-router)# redistribute static subnets
Ruijie(config-router)# network 200.2.2.0 0.0.0.255
area 1
Ruijie(config-router)# network 172.16.24.0 0.0.0.255
area 0
Ruijie(config-router)# area 1 nssa
```

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area range	OSPF ש Э Â

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34.1.44 timers lsa-group-pacing

ৡ LSA ⁑ ⁄ ⁹ Л
˘ ৡ **no** Â

timers lsa-group-pacing *seconds*

no timers lsa-group-pacing

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seconds	LSA ˘ ˘ Â : 10-1800

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: 240 Â

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ˆ LSA

ЛЬЮ ˘ ѝ 120 Â

```
Ruijie(config)#router ospf 20
Ruijie(config-router)#timers lsa-group-pacing 120
```

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spf-delay *spf-holdtime* ˇ OSPF ȷ

spf-delay	ЊЖ SPF ˘ Л∪ ѝ Æ˘ ↓ ' 1-600000 Â OSPF ↓ ˘ SPF spf-delay Л Â
spf-holdtime	ЊЖ ч SPF ˘ Л∪ ѝ Æ˘ ↓ ' 1-600000 Â
spf-max-waittime	ЊЖ ч SPF ˘ Л∪ ѝ Æ˘ ↓ ' 1-600000 Â

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spf-delay' 1000 '

spf-holdtime' 5000 '

spf-max-waittime' 10000 Â

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spf-delay ÿ ↓ SPF ˘ Â SPF γ SPF ѝ *spf-holdtime*˘ Л˘ SPF ѝ Э ч ˘ *spf-max-waittime* Л˘ a ¨Ą ╗ Â ч SPF ˘ ЖЖ SPF ÿ *spf-holdtime* Â

spf-delay *spf-holdtime* ↓ Л∪ Л∪ ╗ ' *spf-max-waittime* ↓ Л∪ Л∪ SPF ˘ ↓ Л∪ ↓ Â

б **timers spf** ʒ ˘ ʒ ˘ ↓ Л∪ ╗ SPF ˘ ↓ Л∪ ↓ SPF ˘ Л∪ **timers throttle spf** ʒ Â

~ :

1¨ spf-holdtime a spf-delay˘ spf-holdtime ╟ ѝ б spf-delay '

2¨ spf-max-waittime a spf-holdtime˘ spf-max-waittime ╟ ѝ б spf-holdtime Â

3¨ timers throttle spf б timers spf Â

4¨ timers spf б timers throttle spf ˘ timers throttle spf

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ЛЬЮ ˘ OSPF SPF à à
ǂ ѝ 5 à1000 à90000 Â ˩ ˘ SPF
ǂ ѝ'
5ms˘ 1s˘ 3s˘ 7s˘ 15s˘ 31s˘ 63s˘ 89s˘ 179s˘ 179+90 ……
Ruijie(config)# **router ospf** *20*
Ruijie(config-router)# **timers spf** *5 1000 90000*

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ꢀ	
show ip ospf	ospf
timers spf	SPF Â 10.4 RGOS ˘ SPF ꢀ Â timers throttle spf ˩ ꢀ timers spf

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34.2

34.2.1 show ip ospf

OSPF ˘ ꢀ **show ip ospf** Â

show ip ospf [*process-id*]

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process-id	ospf /ǀ

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ȝ ȷ Л Ъ OSPF Â

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ЛЪЮ ѝ **show ip ospf** ȝ '

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

OSPF б BFD ╠, Э ╕ "BFD is enabled", Ю'

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

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

NSSA Translator State iselected

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Router ID	Â
Process uptime	OSPF ˆ router-id й 0.0.0.0 a ˜
Bound to VRF	OSPF VRF
Conforms to RFC2328	б RFC2328
RFC1583Compatibility flag	RFC1583 RFC2328 ASBR
Support Tos	↵ TOS0
Supports opaque LSA	opaque-LSA
Router Type	OSPF normal à ABR à ASBR Â
SPF Delay	↵ SPF
SPF-holdtime	ч SPF
LsaGroupPacing	LSA ˘ ˘
Incomming current DD exchange neighbors	˘ incomming exstart
Outgoing current DD exchange neighbors	˘ outgoing ÿ exstart
Number of external LSA	LSA
External LSA Checksum Sum	LSA

Number of opaque LSA	opaque-LSA
Opaque LSA Checksum Sum	opaque-LSA
Number of non-default external LSA	external-LSA
External LSA database limit	external-LSA 8
Exit database overflow state interval	overflow
Database overflow state	OSPF overflow
Number of LSA originated	LSA
Number of LSA received	LSA
Log Neighbor Adjency Changes	↓
Number of areas attached to this router	Э ш
Area type	ш , Default, Stub,NSSA
Number of interfaces in this area	ш
Number of fully adjacent neighbors in this area	ш Full
Number of fully adjacent virtual neighbors through this area	ш Full ’ ↓ ш ’
Area authentication	ш
SPF algorithm last executed	Э SPF
SPF algorithm executed times	SPF
Number of LSA	ш LSA
Checksum Sum	ш LSA
NSSA Translator State	NSSA LSA й External LSA’ NSSA ш˘ з ABR OSPF ’
BFD is enabled	OSPF б BFD ╟

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34.2.2 show ip ospf border-routers

ABR/ASBR OSPF ˘ ¾
show ip ospf border-routers Â

show ip ospf [*process-id*] **border-routers**

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process-id	ospf /I

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¾˘ ˩ЛЦ ABR ASBR OSPF
ÂOSPF a ˩ **show ip route** ˘ OSPF
й OSPF ˘ a Â

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ЛЦЮ й **show ip ospf border-routers** ¾ '

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

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

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

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FastEthernet 0/1	Â
ABR, ASBR	˘ ABR ASBR ч ˘ ٦ Л∪ ٦ ABR ASBR Â
Area 0.0.0.1	˗ ш Â
select	ASBR ˘ select Â

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34.2.3 show ip ospf database

OSPF ˘ ٶ **show ip ospf database** Â

ٶ a ٦ a ٦ ˆ LSAs˜ Â

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

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

show ip ospf [*process-id area-id*] **database** [**self-originate** | **max-age**]

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

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

show ip ospf [*process-id area-id*] **database** [**router**] [**self-originate**]

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

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

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

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

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

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

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

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

[*link-state-id*] [**adv-router** *ip-address*]

opaque-area	ˆ ˩ ˜ LSA
opaque-as	ˆ ˩ ˜ LSA
opaque-link	ˆ ˩ ˜ LSA
database-summary	ˆ ˩ ˜ OSPF LSA

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OSPF ˘ ˦ ˦ Â
ʒ˘ ╠ OSPF Â

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ЛЬЮ ѝ **show ip ospf database** ʒ '

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

          Router Link States (Area 0.0.0.0)
Link ID         ADV Router      Age  Seq#       CkSum
Link count
1.1.1.1       1.1.1.1       2    0x80000011 0x6f39 2
3.3.3.3       3.3.3.3       120  0x80000002 0x26ac 1

         Network Link States (Area 0.0.0.0)

Link ID        ADV Router     Age  Seq#      CkSum
192.88.88.27    1.1.1.1       120  0x80000001 0x5366

         Summary Link States (Area 0.0.0.0)

Link ID         ADV Router      Age  Seq#       CkSum
Route
10.0.0.0        1.1.1.1         2    0x80000003 0x350d
10.0.0.0/24
100.0.0.0       1.1.1.1         2    0x8000000c 0x1ecb
100.0.0.0/16

      Router Link States (Area 0.0.0.1 [NSSA])

Link ID         ADV Router      Age  Seq#       CkSum
Link count
```

```
1.1.1.1       1.1.1.1       2    0x80000001 0x91a2 1

      Summary Link States (Area 0.0.0.1 [NSSA])

Link ID         ADV Router      Age  Seq#       CkSum
Route
100.0.0.0       1.1.1.1         2    0x80000001 0x52a4
100.0.0.0/16
192.88.88.0     1.1.1.1         2    0x80000001 0xbb2d
192.88.88.0/24

   NSSA-external Link States (Area 0.0.0.1 [NSSA])

Link ID         ADV Router      Age  Seq#       CkSum
Route            Tag
20.0.0.0       1.1.1.1         1    0x80000001 0x033c E2
20.0.0.0/24     0
100.0.0.0      1.1.1.1         1    0x80000001 0x9469 E2
100.0.0.0/28    0

               AS External Link States

Link ID         ADV Router      Age  Seq#       CkSum
Route            Tag
20.0.0.0       1.1.1.1         380  0x8000000a 0x7627
E2 20.0.0.0/24    0
100.0.0.0      1.1.1.1         620  0x8000000a 0x0854
E2 100.0.0.0/28   0
```

show ip ospf database ३ ЮÂ

OSPF Router with ID	OSPF б OSPF Л
Router Link States	ЛЬЮ ѝ Â
Net Link States	ЛЬЮ ѝ Â
Summary Net Link States	ЛЬЮ ѝ Â
NSSA-external Link States	ЛЬЮ ѝ
AS External Link States	ЛЬЮ ѝ Â
Link ID	Â
ADV Router	Â

Age	Â
Seq#	ʌ˘ LSA Â
Cksum	Â
Link-Count	
Route	LSA
Tag	Â

ЛЬЮ ѝ **show ip ospf database asbr-summary** ʒ '

```
Ruijie# show ip ospf database asbr-summary
OSPF Router with ID (1.1.1.35) (Process ID 1)
ASBR-Summary Link States (Area 0.0.0.1)
LS age: 47
Options: 0x2 (*|-|-|-|-|-|E|-)
LS Type: ASBR-summary-LSA
Link State ID: 3.3.3.3 (AS Boundary Router address)
Advertising Router: 1.1.1.1
LS Seq Number: 80000001
Checksum: 0xbe8c
Length: 28
Network Mask: /0
TOS: 0  Metric: 1
```

show ip ospf database asbr-summary ʒ ЮÂ

OSPF Router with ID	ЛЬЮ б OSPF ʌ
AS Summary Link States	ЛЬЮ AS Â
LS age	Â
Options	Â
LS Type	Â
Link State ID	Â
Advertising Router	Â
LS Seq Number	ʌ Â

Checksum	Â
Length	˘ ЛυЙ Æ Â
Network Mask	Â
TOS	TOS ˘ ˩ й 0Â
Metric	Â

ЛЬЮ й **show ip ospf database external** ȝ '

```
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 ȝ ЮÂ

LS Seq Number	∧ Â
Checksum	Â
Length	˘ ∩ ѝ Æ Â
Network Mask	Â

LS age	Â
Options	Â
LS Type	Â
Link State ID	Â
Advertising Router	Â
LS Seq Number	/ı Â
Checksum	Â
Length	˘ Л∪ ù Æ Â
Network Mask	Â
Attached Router	Э Â

ЛЬЮ ù **show ip ospf database router** ʒ '

```
Ruijie# show ip ospf database router
OSPF Router with ID (1.1.1.1) (Process ID 1)
Router Link States (Area 0.0.0.0)
LS age: 322
Options: 0x2 (*|-|-|-|-|-|E|-)
Flags: 0x3 : ABR ASBR
LS Type: router-LSA
Link State ID: 1.1.1.1
Advertising Router: 1.1.1.1
LS Seq Number: 80000012
Checksum: 0x6d3a
Length: 48
Number of Links: 2

Link connected to: Stub Network
(Link ID) Network/subnet number: 100.0.1.1
(Link Data) Network Mask: 255.255.255.255
Number of TOS metrics: 0
TOS 0 Metric: 0
```

show ip ospf database router ʒ Ю Â

OSPF Router with ID	Л∪Ю б OSPF /ı Â
Router Link States	ЛЬЮ ù Â

LS age	Â
Options	
Flag	router
LS Type	Â
Link State ID	Â
Advertising Router	Â
LS Seq Number	ʌ Â
Checksum	Â
Length	˘ Л Ù ѝ Æ

OSPF Router with ID	ЛЬЮ б OSPF Л Â
Summary Net Link States	ЛЬЮ й Â
LS age	Â
Options	Â
LS Type	Â
Link State ID	Â
Advertising Router	Â
LS Seq Number	Л Â
Checksum	Â
Length	˘ Лъ й Æ Â
Network Mask	Â
TOS	TOS ˘ л й 0Â
Metric	Â

ЛЬЮ й **show ip ospf database nssa-external** ֳ '

```
Ruijie# show ip ospf database nssa-external
OSPF Router with ID (1.1.1.1) (Process ID 1)
   NSSA-external Link States (Area 0.0.0.1 [NSSA])
LS age: 1
Options: 0x0 (*|-|-|-|-|-|-|-)
LS Type: AS-NSSA-LSA
Link State ID: 20.0.0.0 (External Network Number For
NSSA)
Advertising Router: 1.1.1.1
LS Seq Number: 80000001
Checksum: 0x033c
Length: 36
Network Mask: /24
Metric Type: 2 (Larger than any link state path)
TOS: 0
Metric: 20
NSSA: Forward Address: 100.0.2.1
External Route Tag: 0
```

show ip ospf database nssa-external ३
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OSPF Router with ID	ЛЪЮ б OSPF Л Â
NSSA-external Link States	ЛЪЮ ѝ Â

```
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 ३ ЮÂ

ЛЬЮ ѝ **show ip ospf database database-summary** ʒ '

```
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 ʒ
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OSPF Process	ЛЬЮ /ǀ
Router Link	ѡ ˇ OSPF LSA Â
Network Link	ѡ ˇ OSPF LSA Â
Summary Link	ѡ ˇ OSPF LSA Â
ASBR-Summary Link	ѡ ˇ OSPFASBR LSA Â
AS External Link	ѡ ˇ OSPF LSA
NSSA-external Link	,OSPF NSSA LSA

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```
Designated Router (ID) 1.1.1.1, Interface Address
192.88.88.27
Backup Designated Router (ID) 3.3.3.3, Interface Address
192.88.88.72
Timer intervals configured,Hello 10,Dead 40,Wait
40,Retransmit 5
Hello due in 00:00:03
Neighbor Count is 1, Adjacent neighbor count is 1
Crypt Sequence Number is 70784
Hello received 1786 sent 1787, DD received 13 sent 8
LS-Req received 2 sent 2, LS-Upd received 29 sent 53
 LS-Ack received 46 sent 23, Discarded 1
```

show ip ospf interface serial *1/0* ৡ ЮÂ

FastEthernet 0/0 State	˘ UP ˘ Down Â
Internet Address	IP Â
Area	OSPF ৺ Â
MTU	MTU
Matching network config	OSPF network area
Process ID	/ৗ
Router ID	OSPF Â
Network Type	OSPF Â
Cost	OSPF Â
Transmit Delay is	OSPF Â
State	DR/BDR Â
Priority	˝ৗ
Designated Router(ID)	DR
DR's Interface address	DR
Backup designated router(ID)	BDR
BDR's Interface address	BDR
Time intervals configured	Hello˘ Dead˘ Wait˘ Retransmit

Hello due in	Э HELLO
Neighbor count	
Adjacent neighbor count	Full
Crypt Sequence Number	md5 Л
Hello received send	б HELLO Â
DD received send	б DD Â
LS-Req received send	б LS Â
LS-Upd received send	б LS Â
LS-Ack received send	б LS Â
Discard	OSPF Â
BFD enabled	OSPF б BFD ╟

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34.2.5 show ip ospf neighbor

OSPF ˘ ҃ **show ip ospf neighbor** Â

show ip ospf [*process-id*] **neighbor** [[**detail**] | [[*interface-type interface-number*] [*neighbor-id*]]]

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detail	ˆ ┘ ~ Â
interface-type interface-number	ˆ ┘ ~ Â
neighbor-id	ˆ ┘ ~ Â

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ꝛ ⊣ Л Ъ ˘ ꝛ OSPF
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ЛЪЮ ѝ **show ip ospf neighbor** ꝛ '

```
Ruijie# show ip ospf neighbor
OSPF process 1, 1 Neighbors, 1 is Full:
Neighbor ID     Pri   State       BFD State Dead Time
Address         Interface
3.3.3.3           1   Full/BDR          Up    00:00:32
192.88.88.72    FastEthernet 1/0

Ruijie# show ip ospf neighbor detail
Neighbor 3.3.3.3, interface address 192.88.88.72
In the area 0.0.0.0 via interface FastEthernet 1/0
Neighbor priority is 1, State is Full, 11 state changes
DR is 192.88.88.27, BDR is 192.88.88.72
Options is 0x52 (*|O|-|EA|-|-|E|-)
Dead timer due in 00:00:32
Neighbor is up for 05:11:27
Database Summary List 0
Link State Request List 0
Link State Retransmission List 0
Crypt Sequence Number is 0
Thread Inactivity Timer on
Thread Database Description Retransmission off
Thread Link State Request Retransmission off
Thread Link State Update Retransmission off
Thread Poll Timer on
BFD session state up
```

show ip ospf neighbor ꝛ ЮЎ

Neighbor ID	Â
Pri	″I ˆ DR ˜
State	
Dead Time	Dead

Address	
Interface	
interface address	
In the area	˗ ʁ
via interface	Â
Neighbor priority	OSPF ˝I Â
State	OSPF ÂFULL ’ DR ѝ ’ BDR ѝ ’ DROTHER a DR/BDR Â DR BDR Â
State changes times	⅃
Dead Time	ˈ
DR	DR (Hello DR)
BDR	BDR (Hello BDR)
Options	Hello E ˇ 0 ʁ ѝ STUB’ ˇ ʁ a STUB ʁ Â
Dead timer due in	Â
Neighbor up time	
Database Summary List	DD
Link State Request List	LS
Link State Retransmission List	
Crypt Sequence Number	ʁ MD5
Thread Inactivity Timer	
Thread Database Description Retransmission	DD
Thread Link State Request Retransmission	LS
Thread Link State Update Retransmission	LS

Thread Poll Timer	˘ Poll Timer ╟

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34.2.6 show ip ospf route

ospf Â

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

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process-id	ospf /ˇ ospf Â
count	ospf Â

ð Ô

ð ¾ Ô

Â

ð Ô

ð Ô

```
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 ¾ ЮЎ

codes	Л

[1]	cost
via	Ю б

ð ꝛÔ

ð ⊀ Ô

ð Ô

34.2.7 show ip ospf summary-address

OSPF ǂ ˘ ꝛ

show ip ospf summary-address Â

show ip ospf summary-address

ð Ô

ꝛ Â

ð Ô

ὶ Â

ð ꝛ Ô

Â

ð Ô

ꝛ ∢ NSSA ABR Э ˘ з ∢

Â

ð Ô

ЛЬЮ ὶ **show ip ospf summary-address** ꝛ '

```
Ruijie# show ip ospf summary-address
Summary Address Summary Mask    Advertise     Status
Aggregated subnets
--------------- --------------- ------------ --------
202.101.0.0          255.255.0.0          advertise
Inactive 0
Ruijie#
```

Summary Address	
Summary Mask	Â

Advertise	Ὠ
Status	
Aggregated subnets	

ð ⊀ Ô

ð Ô

34.2.8 show ip ospf virtual-link

OSPF ˘ ꢀ **show ip ospf virtual-link** Â

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

ð Ô

ꢀ	

ð Ô

ѝ Â

ð ꢀ Ô

Â

ð Ô

˘ ⊀ ꢀ ˘ Л∪ è Â **show ip ospf neighbor** ꢀ a Â

ð Ô

ЛЬЮ ѝ **show ip ospf virtual-links** ꢀ '

```
Ruijie# show ip ospf virtual-links
Virtual Link VLINK0 to router 1.1.1.1 is up
Transit area 0.0.0.1 via interface FastEthernet 0/1
Local address 10.0.0.37/32
Remote address 10.0.0.27/32
Transmit Delay is 1 sec, State Point-To-Point,
Timer intervals configured, Hello 10, Dead 40, Wait 40,
Retransmit 5
Hello due in 00:00:05
```

Adjacency state Full

ЮÂ

Virtual Link VLINK0 to router	Л∪
Virtual Link state	.
Transit area	ѡ Â
via interface	Â
Local address	
Remote Address	
Transmit Delay	ε

35 BGP

35.1

35.1.1 address-family ipv4

ৡ **address-faimly IPv4** BGP Â
exit-address-family ৡ BGP Â

address-family ipv4 [**unicast]**

no address-family ipv4 [**unicast**]

ð Ô

unicast	৶ ˘ IPv4

ð Ô

ð ৡ Ô

BGP Â

ð Ô

BGP ˘ ৶ Ո IPv4 Â

BGP ˘ ৶ Ո ৡ **exit-address-family** Â

ð Ô

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# address-family ipv4
```

ð ৡ Ô

ৡ	
exit-address-family	

35.1.2 address-family ipv4 vrf

¦ **address-faimly IPv4 VRF** BGP ˘
vrf ╖ Â ¦ **no** ˘ б vrf
╖ Â **exit-address-family** ¦ BGP
Â

address-family ipv4 vrf *vrf-name*

no address-family ipv4 vrf *vrf-name*

ð Ô

vrf-name	vrf ┘

ð Ô

Ⱶ vrf

ð ¦ Ô

BGP Â

ð Ô

¦ ^ ˜ PE CE Â
BGP ˘ ┘Ո ¦ **exit-address-family** Â

ð Ô

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# address-family ipv4 vrf vpn1
```

ð ¦ Ô

¦	
exit-address-family	

35.1.3 address-family vpnv4

¦ PE VPN ˘
address-family VPN Â **exit-address-family** ¦
address-family VPN Â

address-family vpnv4 [**unicast**]

no address-family vpnv4 [**unicast**]

ð Ô

unicast	৲ ˘ IPv4

ð Ô

Ⱶ vpn

ð ৡ Ô

BGP Â

ð Ô

ৡ vpn Ⱶ PE
vpn

BGP ˘ ৲ Ո ৡ **exit-address-family** Â

ð Ô

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# address-family vpnv4
```

ð ৡ Ô

ৡ	
exit-address-family	

35.1.4 aggregate-address IPv4

ৡ BGP IPv4 Â ৡ **no**
৷ Â

aggregate-address *ip-address mask* [**as-set**][**ummary-only**]

no aggregate-address *ip-addres mask* [**as-set**][**summary-only**]

ð Ô

ip-address	
mask	
as-set	AS Â
summary-only	৲ Ὼ ৶

ð Ô

Â

ð ¯ Ô

BGP ˘ BGP IPv4 ˘ BGP IPv4 VRF

ð Ô

BGP ˙ Ω ˚ ˘ ˙ Ω ˚ ˘ **aggregate-address summary-only** ¯ Â

ð Ô

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# aggregate-address 10.0.0.0
255.0.0.0 as-set
```

ð ¯ Ô

¯	
router bgp	BGP Â

35.1.5 bgp always-compare-med

¯ BGP Multi Exit Discriminator MED Â ¯ **no** ¶ Â

bgp always-compare-med

no bgp always-compare-med

ð Ô

¯

ð Ô

Ю ˙ AS MED Â

ð ¯ Ô

BGP Â

ð Ô

Ю ˙ ˙ AS MED ˘ a ˙ AS MED ˘ ¯ Â ˙ ˘ MED ¨I Â a ˙ ˙ IGP ˘ a ¯

ð Ô

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

ð ৡ Ô

ৡ	
show ip bgp	BGP
bgp bestpath med confed	˘ AS MED
bgp bestpath med missing-as-worst	˘ MED ″I ѝ æ Â
bgp deterministic-med	˘ ⅄ AS ″I

35.1.6 bgp bestpath as-path ignore

˘ ৡ a AS Â ৡ

no ℸ Â

bgp bestpath as-path ignore

no bgp bestpath as-path ignore

ð Ô

ৡ Â

ð Ô

Ю AS Â

ð ৡ Ô

BGP

ð Ô

(RFC1771) ʊ

३	
show ip bgp	BGP

35.1.7 bgp bestpath compare-confed-aspath

˘ ३ ⊿ ASPATH
˘ ASPATH ˘ ″I Â ३ **no**

ˇ ֳ ˩ router IDˇ
router ID ˇ ˝I Â ֳ **no** ╖ Â

bgp bestpath compare-routerid

no bgp bestpath compare-routerid

ð Ô

ֳ Â

ð Ô

Юˇ ˇ ч ÿ a ˩ EBGP peers
˩ ˇ ѝ Â

ð ֳ Ô

BGP Â

ð Ô

Юˇ ˇ ч ÿ a ˩ EBGP peers ˩ ˇ
Â ˩Л▫ ֳˇ router ID ѝ
Â

ð Ô

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

ð ֳ Ô

ֳ	
show ip bgp	BGP
bgp router-id	BGP Router ID

35.1.9 bgp bestpath med confed

ˇ ֳ AS
MED Â ֳ **no** ╖ Â

bgp bestpath med confed [**missing-as-worst**]

no bgp bestpath med confed [**missing-as-worst**]

ð Ô

missing-as-worst	৸ MED ˮl ৸ æ

ð Ô

ЮЎ a AS MED
Â

ð ৡ Ô

BGP Â

ð Ô

AS MED ˘ ˩
Л∪ Â

ð Ô

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

ð ৡ Ô

ৡ

Ю MED ˘ MED
ѝ 0Â MED ˘ ″I ˘
″I Â

ð ৡ Ô

BGP Â

ð Ô

Ю MED ˘ MED
ѝ 0 MED ˘ ″I ˘ Л MED
″I Â MED ″I ѝ
æ ৡ Â

ð Ô

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# bgp bestpath med
missing-as-worst
```

ð ৡ Ô

ৡ	
show ip bgp	BGP

bgp bestpath

ð ¾ Ô

BGP Â

ð Ô

ЮЎ ¬ a ˘
¬ ¬ Â ˘
˘ ¬ЛЦ¬ ¬ ¬ ╖ Â

¬ ¬ ╖ ˘ ¾ **no bgp client-to-client reflection** Â

ð Ô

```
Ruijie(config)#
```

ð Ô

router ID

ð Ô

BGP speakers Ÿ IBGP ˘
BGP speaker EBGP Â
BGP speakers EBGP ˘ ˘ Ю
à MED

BGP speakers EBGP ˘ ˘ Ю
à MED Л ″I Ÿ a ⅄ Â

ৡ AS Â

~

ৡ ⅄Л 15 ˘ 15 ˘
ϯ Â

ð Ô

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

ð ৡ Ô

ৡ	
bgp confederation identifier	

ð ⅄ Ô

35.1.15 bgp default ipv4-unicast

ৡ address family ѝ IPv4 Â ৡ
no Â

bgp default ipv4-unicast

no bgp default ipv4-unicast

ð Ô

ৡ Â

ð Ô

ipv4-unicast Â

ð ৡ Ô

BGP Â

ð Ô

ৡ BGP **address family ѝ ipv4** Â

ð Ô

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

35.1.18 bgp enforce-first-as

¾ AS_PATH a AS /ł
UPDATE Â no ¾ è Â

bgp enforce-first-as

no bgp enforce-first-as

ð Ô

¾ Â

ð Ô

Ћ

ð ¾ Ô

BGP

ð Ô

ЮЎ UPDATE ˇ AS /ł Â

ð Ô

```
Ruijie(config-router)# bgp enforce-first-as
```

ð ¾ Ô

¾	
show ip bgp	BGP

35.1.19 bgp fast-external-fallover

¾ #Qd1Rp ðŒ‘Šh‚w, Uó ¸ 9 } / BGPnoCÀK•Ó‘—r CÃ X!‰ Äfast-ext527

BGP Â

ð Ô

ৡ ৸ EBGP Â

ð Ô

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

ð ৡ Ô

ৡ	
router bgp	BGP

35.1.20 bgp log-neighbor-changes

ৡ a debug Ю BGP ৶ Â
ৡ **no** ℼ

bgp log-neighbor-changes

no bgp log-neighbor-changes

ð Ô

ৡ Â

ð Ô

ℼ

ð ৡ Ô

BGP

ipv4	Æ peer ipv4 Â

ð ¾Ô

¾	
neighbor soft-reconfiguration inbound	BGP session˘ BGP ( )
show ip bgp	BGP

35.1.23 clear ip bgp dampening

¾ ⁸ ⁸ Â

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

ð Ô

ipv4 unicast	IPv4
address	IP Â
mask	Â

ð Ô

ð ¾ Ô

ð Ô

¾ BGP ˘ ⁸ ⁸ Â
¾ ⅃ Л∪ ╟ BGP Â

ð Ô

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

ð ¾Ô

¾	
show ip bgp dampening dampened-paths	
bgp dampening	ℸ

35.1.24 clear ip bgp external

ৡ EBGP Æ

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

ð Ô

ipv4 unicast	ipv4
in	a ╗ soft˝ Æ ў ╠ Â
out	a ╗ soft˝ Æ BGP speaker ў ╠ Â
soft in	Æ˘ Æ Â
soft out	Æ˘ ↑ Æ Â

ð Ô

ð ৡ Ô

Â

ð Ô

ৡ Л∪ BGP Æ Â

ð Ô

```
Ruijie# clear ip bgp external in
```

ð ৡ Ô

ৡ	
clear ip bgp	Æ BGP
show ip bgp neighbors	BGP

35.1.25 clear ip bgp flap-statistics

ৡ Â

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

ð Ô

address	IP

mask	

ð Ô

ð ३ Ô

Â

ð Ô

३ ৲ ˘ ≠ a

Â ˘ ৲ Ո

soft out	Æ˘ † Æ Â

ð Ô

ð ¯ Ô

Â

ð Ô

¯ Æ vrf BGP Â

ð Ô

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

ð ¯ Ô

¯	
clear ip bgp	Æ BGP
show ip bgp	BGP

35.1.28 default-informnation originate

¯ † ˘ † Â
¯ no ˘ † Â

[**no**] **default-informnation originate**

ð Ô

¯ Â

ð Ô

¯ no ˘ a † Â

ð ¯ Ô

BGP Â

ð Ô

¯ ⁸ † Âɹ †
˘ ¯ Â

¯ **network** ¯ Â a ɹ **' default-informnation originate** ¯ ⁸ † ˘ network ¯ ɹ IGP ɹ Ո Â

ð Ô

```
Ruijie(config-router)# default-informnation originate
```

ð ¾ Ô

¾	
network	Ώ
redistribute	¦ è

35.1.29 default-metric

¾ BGP ¦ metric Â ¾ **no** ˘ ˘ Â

default-metric *number*

no default-metric

ð Ô

number	metric Â ' 1.. 4294967295

ð Ô

¾ **no** ˘ default-metric Â

ð ¾ Ô

BGP ˘ Â

ð Ô

¾ ¦ BGP metric Â ¤ ¦ Э metric a Â

~

¾ metric ˘ a ¾ **redistribute metric** metric Â

default-metric ¦ connected Э ˘ metric 0 Â

ð Ô

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

ð ¾ Ô

¾	
redistribute	↑ è

35.1.30 distance bgp

¾ ù a ↓ BGP a ↓ Â **no** ¾ Â

distance bgp *external-distance internal-distance local-distance*

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

ð Ô

external-distance	ÿ EBGP peers ¯ Â ' 1..255
internal-distance	ÿ IBGP peers ¯ Â ' 1..255
local-distance	ÿ peers ¯ ˘ ù ↓Ло ÿ IGP ¯ ˘ **network backdoor** ¾ Â ' 1..255

ð Ô

Ю'

external-distance: *20*

internal-distance: *200*

local-distance: *200*

ð ¾ Ô

BGP Â

ð Ô

a ↓ BGP Â ˘ Ю '

1. external-distance è IGP (OSPF à RIP)
   æ'
2. internal-distance local-distance è IGP

Â

ð Ô

```
Ruijie(config-router)# distance bgp 20 20 200
```

ð ¾Ô

¾	
neighbor soft-reconfiguration inbound	BGP session˘ BGP ( )
show ip bgp	BGP

ð ¼ Ô

35.1.31 exit-address-family

¾ BGP address-family Â

exit-address-family

ð Ô

¾ Â

ð Ô

ð ¾ Ô

BGP address-family Â

ð Ô

¾ ¼Ло ÿ bgp address-family bgp Â

ð Ô

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

ð ¾Ô

¾	
address-family ipv4	**address-family ipv4**

35.1.32 ip as-path access-list

¾ Iж AS Â no ¾
Â

ip as-path access-list *path-list-num* {**permit** | **deny**}
regular-expression

no ip as-path access-list *path-list-num*

ð Ô

path-list-num	AS ⁸ ⅃ AS ˘ ' 1---500 Â
permit	
deny	
regular-expression	Â ' 1..255 Â

ð Ô

ᏂᏁ

ð ৡ Ô

Â

ð Ô

ê BGP Ì Â

ð Ô

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

ð ৡ Ô

ৡ	
neighbor filter-list	Э as-path ⁸
neighbor distribute-list	Э ↾

35.1.33 neighbor activate

ৡ Ю Â ৡ no ⅃ Л Â

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

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

ð Ô

peer-address

peer-group-name	⅃ Â ⅃ a 32 Â
seconds	Â : 1..600

ð Ô

IBGP : 15seconds

EBGP : 30seconds

ð ३ Ô

BGP

ð Ô

BGP

number	AS ʌ ' ѝ З' ѵ [1,10]

ð Ô

allowas-in ╖

ð ꝛ Ô

BGP ˘ BGP IPv4 ˘ BGP IPv4VRF

ð Ô

ѝ spoke_hub ˘ PE Э ꝛ˘ PE ѵ Л℧
Ѧ Â PE Э ч vrf è
vrf PE ˘ CE˝ ʌ vrf CE
˘ PE Â
IBGP EBGP ѵ Л℧ Â

ð Ô

```
Ruijie(config)#
```

peer-group-name	ɻ Â ɻ a 32 Â

ð Ô

as-override ╖

ð ϡ Ô

BGP ˘ BGP IPv4 ˘ BGP IPv4VRF

ð Ô

Ю˘ BGP a έ ɻ AS ʌ ˘
ϡ ɻ Л∪ AS ʌ˘ BGP ɻ Л∪ ÿ ɻ AS ʌ
Â
vpn ˘ ή ч CE έ ɻ AS ʌ˘ ж
Ю˘ ч CE ╕ ˘ PE Э Э ϡ ʌ˘
ɻ Л∪ PE CE AS ʌ˘ ʎ CE ɻ Л∪ Â
ɻ EBGP ╖ Â

ð Ô

```
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
```

ð ϡ Ô

ϡ	

peer-address	Â
peer-group-name	¼ Â ¼ a 32 Â
map-tag	route map ¼ Â route map ¼ a 32 Â

ð Ô

a Â

ð ¾ Ô

BGP Â

ð Ô

peer-address	Â
peer-group-name	ﻝ Â ﻝ a 32 Â
text	( ) Â ' 80 Â

ð Ô

╗ Â

ð ৡ Ô

BGP Â

ð Ô

ৡ ѝ ˆ ˜ ╗ Â ﻝ Л∪ ╠
ˆ ˜ Â

ð 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 description
xyz.com
```

ð ৡ Ô

ৡ	
router bgp	BGP
neighbor remote-as	BGP ( ) Â

35.1.39 neighbor distribute-list

ﻝ BGP ˇ ACL Â
ৡ no ﻝ ACL Â

neighbor {*peer-address* | *peer-group-name*} **distribute-list** *access-list-number* {**in** | **out**}

no neighbor {*peer-address* | *peer-group-name*} **distribute-list** *access-list-number* {**in** | **out**}

ð Ô

peer-address	ˇ ﻝ IPv4 ˇ ≠ ﻝ IPv6 Â

peer-group-name	٫ Â ٫ a 32 Â
access-list-number	ACL ٨
in	ACL Â
out	ACL ٭ Â

ð Ô

٦ Â

ð ٪ Ô

BGP ˘ BGP IPv4 ˘ BGP IPv6
˘ BGP IPv4 VRF ˘ BGP VPNv4

ð Ô

(in) (out)˘ ˘ ٪ neighbor
prefix-list γ a ˘ ٧ ٪ Â
BGP ˘ ٣ ٫Ո
٪ Â ٧ **neighbor distribute-list**˘
è Â
˘ ٫Ո a ٫ Э a ٫ ˘
٨ Â

ð Ô

```
Ruijie(config)# router bgp 60
Ruijie(config-router)# neighbor 10.1.1.1 remote-as BèÇ&q ÓiFp p Â ð WÎ
```

3

¯ ¬ BGP ˘ Â
¯ no ¬ 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* {**in** | **out**}

ð Ô

peer-address	˘ ¬ IPv4 ˘ ≠ ¬ IPv6 Â
peer-group-name	¬ Â ¬ a 32 Â
access-list-numbe	as-path list Ñ
in	as-path list Â
out	as-path list ¦ Â

ð Ô

Ì Â

ð ¯ Ô

BGP ˘ BGP IPv4 ˘ BGP IPv6
˘ BGP IPv4 VRF ˘ BGP VPNv4

ð Ô

BGP ˘ ¯
˘ й **neighbor filter-list** è
Â

˘ ¬ Ло a ¬ Э a ¬ ˘
¸ Â

ð Ô

```
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
```

ð ¯ Ô

¯	

router bgp	BGP
neighbor remote-as	BGP Â
ip as-path access-list	AS_PATH list
match as-path	ʔ AS_PATH list

35.1.42 neighbor maximum-prefix

ʒ ⁸ ÿ BGP Â ʒ **no** ɻ ⁸ Â

neighbor {*peer-address* | *peer-group-name*} **maximum-prefix** *maximum* [*threshold*] [**warning-only**]

no neighbor {*peer-address* | *peer-group-name*} **maximum-prefix**

ð Ô

peer-address	˘ ɻ IPv4 ˘ ≠ ɻ IPv6 Â
peer-group-name	ɻ Â ɻ a 32 Â
maximum	Э Â
threshold	ˀ
warning-only	Э a BGP ˘ Â

ð Ô

˥ Â

ð ʒ Ô

BGP ˘ BGP IPv4 ˘ BGP IPv6 ˘ BGP IPv4 VRF ˘

ð Ô

Ю˘ Э ˘ BGP Â a ˘ ӂ ɻ Л∪ warning-only ⁸ Â

BGP ˘ ӂ ʒ ˘ и ʒ˘ è Â

ð Ô

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

ð ¯ Ô

¯	
router bgp	BGP
neighbor remote-as	BGP Â

35.1.43 neighbor next-hop-self

BGP ¯ ˘ ¯ Ю
ы BGP speaker Â ¯ **no** ¬ Â

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

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

ð Ô

peer-address	˘ ¬ IPv4 ˘ ≠ ¬ IPv6 Â
peer-group-name	¬ Â ¬ a 32 Â

ð Ô

Ъ Â

ð ¯ Ô

BGP ˘ BGP IPv4 ˘ BGP IPv6
˘ BGP IPv4 VRF ˘

ð Ô

¯ ў (Frame Relay à X.25) ˘
˘ ¬ BGP speakers a Â

BGP ˘ ж ¯
Â

ð Ô

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

BGP ˘ ৠ ৡ
˘ ৸ ৡ˘ è
Â

a Ю ˘ password ৶ ˘ a
Â

ð Ô

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

ð ৡ Ô

ৡ	
router bgp	BGP
neighbor remote-as	BGP Â

35.1.45 neighbor peer-group (assigning members)

ৡ BGP ৸ BGP Â ৡ
no BGP ÿ Â

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

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

ð Ô

peer-address	˘ ৶ IPv4 ˘ ≠ ৶ IPv6 Â
peer-group-name	৸ Â ৸ a 32 Â

ð Ô

a Â

ð ৡ Ô

BGP

ð Ô

Â

ÿ ↓ ʒ ˘
a Â ˘
Ю '

remote-as à **update-source** à **local-as** à **reconnect-interval** à **times** à **advertisemet-interval** à **default-originat**e 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

~

a a ↓ ↓ peer-group ˘ ≠ a IBGP EBGP ↓ peer-group Â

ð Ô

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

prefix-list-name	prefix-list ﻝ Â ﻝ a 32 Â
in	prefix list Â
out	prefix list ﺡ Â

ð Ô

ﳕ Â

ð ٪ Ô

BGP ˘ BGP IPv4 ˘ BGP IPv6 ˘ BGP IPv4 VRF ˘ BGP VPNv4

ð Ô

(in) (out)˘ ˘ ٪ **neighbor distribute-list** γ a ˘ ﻝ ٪ Â

BGP ˘ ﻡ ٪ ˘ ﻯ neighbor prefix-list in˘ è Â

˘ ﻝﻦ a ﻝ Э a ﻝ ˘ ⁸ Â

ð Ô

```
Ruijie(config)# ip prefix-list bgp-filter deny
10.0.0.1/16
Ruijie(config)# router bgp 65000
Ruijie(config-router)# neighbor 10.0.0.1 prefix-list
bgp-filter in
```

ð ٪Ô

٪	
router bgp	BGP
neighbor remote-as	BGP Â
ip prefix-list	ip

35.1.48 neighbor remote-as

٪ BGP ( )Â ٪ **no** ( )Â

neighbor {*peer-address* | *peer-group-name*} **remote-as** *as-number*

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

peer-address	˘ ˩ IPv4 ˘ ≠ ˩ IPv6 Â
peer-group-name	˩ Â ˩ a 32 Â

ð Ô

¶

ð ¯ Ô

BGP ˘ BGP IPv4 ˘ BGP IPv6
˘ BGP IPv4 VRF ˘

ð Ô

¯ ˩ EBGP Â

AS AS /ı EBGP AS /ı˘
a AS /ı Â

AS /ı ' 64512¨ 65535 Â

ð Ô

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# neighbor 10.0.0.1
remove-private-as
```

ð ¯ Ô

¯	
router bgp	BGP
neighbor remote-as	BGP Â

35.1.50 neighbor route-map

¯ ¬ Â ¯ **no**
¶ Â

neighbor {*peer-address* | *peer-group-name* } **route-map** *map-tag* {**in** | **out**}

no neighbor {*peer-address* | *peer-group-name* } **route-map** *map-tag* {**in** | **out**}

ð Ô

[redacted]

hÛA Ÿ `# @ SÁ S"u Ö‘þÏ TÂ #lë-Þ ÆðÔsm1 / ðÁ t !fØu ZŭÛ‣ #r?#ÆP vQ ñ ÐU # ¦! X˜† P <30€ ,ÕÃ6Ñ Ö 0ÑÍÓP `4X

[redacted]

ip-address	Â
peer-group-name	¸ Â ¸ a 32 Â

ð Ô

Ÿ

ð ¾ Ô

BGP

ð Ô

ÞÖ IBGP speakers
˘ BGP speaker a ÿ IBGP peer ¯ è
IBGP peers˘ Ло Â
˙ Ло ¾ ˙ ˘ a Ą IBGP speakers
˘ ˙ ¯ IBGP
è IBGP peers Â

ð Ô

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

ð ¾ Ô

¾	
router bgp	BGP
neighbor remote-as	BGP Â
bgp cluster-id	˙ ID Â
bgp client-to-client reflection	˙ ˙ Â

35.1.52 neighbor send-community

¾ BGP Â ¾ **no**
Ÿ Â

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

[**both**|**standard**|**extended**]

ð Ô

ð Ô

peer-address	˘ ┘ IPv4 ˘ ≠ ┘ IPv6 Â
peer-group-name	┘ Â ┘ a 32 Â

ð Ô

peer-address	˘ ˩ IPv4 ˘ ≠ ˩ IPv6 Â
peer-group-name	˩ Â ˩ a 32 Â

ð Ô

˥

ð ˀ Ô

BGP

ð Ô

ˀ BGP ˘ BGP ( )
Â

ˀ ˘ ˩ ⁹ ˘ ⋕ a
ˀ˘ ˩Л **show ip bgp neighbors**
⁹ Â

BGP ˘ ⋕ ˀ
˘ и ˀ˘ è
Â

ð Ô

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

ð ˀ Ô

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

35.1.55 neighbor soo

ˀ ľ Ŀ , **no** ˀ ˧ ľ
Ŀ Â

neighbor [*peer-address* | *peer-group-name*] **soo soo-value**

no neighbor [*peer-address* | *peer-group-name*] **soo**

ð Ô

peer-address	Â
peer-group-name	ﻝ Â ﻝ a 32 Â

soo Âsoo_value ﻝ Ո ч a ﻝ '

ˆ 1˜ soo_value as_num' nn an_num

soo-value ˜ Ò6 Õ ţ ﻫ Õ ų

neighbor [*peer-address* | *peer-group-name*] **timers** *keepalive holdtime*

no neighbor [*peer-address* | *peer-group-name*] **timers** *keepalive holdtime*

ð Ô

peer-address	˘ ┘ IPv4 ˘ ≠ ┘ IPv6 Â
peer-group-name	┘ Â ┘ a 32 Â
keepalive	BGP KEEPALIVE message Â ' 0..65535 Â
holdtime	ŕ BGP Ÿ Â ' 0..65535 Â

ð Ô

keepalive: 60

holdtime: 180

ð ʒ Ô

BGP

ð Ô

keepalive a holdtime Ь† Â

ŕ peer peer-group Л˘ ж peer peer group ʒ ˘ б Â

BGP ˘ ж ʒ ˘ ŕ ʒ˘ è Â

ð Ô

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# neighbor 10.0.0.1 80 240
```

ð ʒ Ô

ʒ	
router bgp	BGP
timers bgp	*keepalive holdtime*

35.1.57 neighbor unsuppress-map

¯ Ø "l **aggregate-address** ¯ 8
Â ¯ **no** Â

neighbor {*peer-address* | *peer-group-name*} **unsuppress-map** *map-tag*

no neighbor {*peer-address* | *peer-group-name*} **unsuppress-map**

ð Ô

peer-address	Â
peer-group-name	¸ Â ¸ a 32 Â
map-tag	route-map ¸ Â route map ¸ a 32 Â

ð Ô

Ÿ

ð ¯ Ô

BGP

ð Ô

¯ Ø 8 Â
BGP ˘ ж ¯
˘ и ¯˘ è
Â

ð Ô

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# neighbor 10.0.0.1
unsuppress-map unspress-route
```

ð ¯ Ô

¯	
router bgp	BGP
neighbor remote-as	BGP Â
aggregate-address	
route-map	route-map

35.1.58 neighbor update-source

ﻝ IBGP BGP ˘ ꝛ BGP
Â ꝛ **no** ╟ ㄱ Â

neighbor {*peer-address* | *peer-group-name*} **update-source** *interface-type interface-index*

no neighbor {*peer-address* | *peer-group-name*} **update-source** *interface-type interface-index*

ð Ô

peer-address	˘ ﻝ IPv4 ˘ ≠ ﻝ IPv6 Â
peer-group-name	ﻝ Â ﻝ a 32 Â

interface-type ㄱ ḥ ꓥ ' j M

neighbor remote-as	BGP Â

35.1.59 neighbor version

¾ BGP BGP /I Â ¾
no /I Â

neighbor {*ip-address*|*peer-group-name*} **weight** *number*

no neighbor {*ip-address*|*peer-group-name*} **weight**

ð Ô

ip-address	Â
peer-group-name	ﻝ Â ﻝ a 32 Â
number	Â ﻝ ' 0…65535

ð Ô

˘ ÿ ﻭ Ơ
ﻭ 32768 Â

ð ৡ Ô

BGP Â

ð Ô

ৡ Л Ы˘ ÿ ﻭ
Â ˘ ″I Â

route-map set weight ˘ ৡ
Â

ð Ô

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

ð ৡ Ô

ৡ	
router bgp	BGP
neighbor remote-as	BGP Â

35.1.61 network(BGP)

ৡ BGP speaker Ὼ Â ৡ **no**
Â

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

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

ð Ô

network-number	Ñ
mask	
map-tag	route-map ɹ Â route map ɹ a 32 Â
backdoor	ẁ ɹ

ð Ô

ð ৡ Ô

BGP

ð Ô

ৡ IGP BGP ˘ Ὼ ɻ Ʌʊ
˘ ╟ Â

route-map ɻ Ʌʊ

ð Ô

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

ð ৡ Ô

ৡ	
router bgp	BGP
redistribute	ɼ
Network synchronization	Network ɹ

35.1.62 network synchronization

ৡ BGP speaker ɹ ɹ Ὼ network
Â ৡ **no** ɻ Ʌʊ Ὼ network
Â

network synchronization

no network synchronization

ð Ô

ð Ô

ð ¯ Ô

BGP

ð Ô

¯ network ˘ a ˘

ð Ô

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

ð ¯Ô

¯	
router bgp	BGP
redistribute	´
network(**BGP**)	´

35.1.63 redistribute

´ ¯˘ Ù Ú è BGP
´ ˘ ¯ **no** Ù Ú ¶ è Â

redistribute *protocol-type* [**route-map** *map-tag*] [**metric** *metric-value*]

no redistribute *protocol-type* [**route-map** *map-tag*] [**metric** *metric-value*]

ð Ô

ð ३ Ô

BGP ˘ BGP IPv4 ˘ BGP IPv6
˘ BGP

redistribute ospf *process-id* [**route-map** *map-tag*] [**metric** *metric-value*] [**match internal external** [**1**|**2**] **nssa-external** [**1**|**2**]]

no redistribute ospf *process-id* [**route-map** *map-tag*] [**metric** *metric-value*] [**match** {**internal**|**external** [**1**|**2**]|**nssa-external** [**1**|**2**]}]

ð Ô

process-id	¦ OSPF Ñ
route-map *map-tag*	**route-map** ¸ Â **route-map**
metric *metric-value*	¦ metric Â a Â
match	¬ OSPF
internal	OSPF internal ˘ ¼ ¦ ospf match Â
external [**1**|**2**]	OSPF external ˘ ¸ Ո ɛ 1 2˝ a ˘ 1 2
nssa-external [**1**|**2**]	OSPF nssa-external ˘ ¸ Ո ɛ 1 2˝ a ˘ 1 2

ð Ô

¦ OSPF Â

ð ¾ Ô

BGP ˘ BGP IPv4 ˘ BGP IPv6 ˘ BGP IPv4 VRF Â

ð Ô

˘

Â ¸ ˘ ¦ ¹ Â

&

no ¾ ˘ ˘ ɜ ˘ no Â ˘ redistribute no Â ˘ Â

~

OSPF ' ″I match OSPF
ˇ Л ″Ą route-map Â metric
ˇ ″I ƒ Э metric route-map ˇ route-map
ˇ route-map Л ' route-map ˇ
metric ˇ metric ' ч ˇ
ƒ Э Â

ð Ô

```
Ruijie(config-router)# redistribute ospf 2 route-map
static-rmap
Ruijie(config-router)# no redistribute ospf 4 match
external route-map ospf-rmap
Ruijie(config-router)# no redistribute ospf 78
```

ð ʒ Ô

level-1-2

ᚴ isis level-1

¯	
show ip protocols	

35.1.66 router bgp

BGP ˘ /\˘ BGP Â
¯ **no** BGP Â

router bgp *as-number*

no router bgp *as-number*

ð Ô

no synchronization

ð Ô

ৡ

keepalive ' 60

holdtime ′ 180

ð ֳ Ô

BGP

ð Ô

keepalive a holdtime Ь Â

ѝ peer peer-group Л ˘ ж peer peer

group ֳ ˘ б Â

BGP ˘ ж ֳ

˘ ѝ ֳ ˘ è

Â

ð Ô

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# timers bgp 80 240
```

ð ֳ Ô

ֳ	
neighbor timers	*keepalive* *holdtime*

35.2

35.2.1 show ip bgp

ֳ BGP Â

show ip bgp [{*network* | *network-mask*}] [**longer-prefixes**]

ð Ô

ð Ô

ৡ BGP

ð Ô

```
Ruijie# show ip bgp
Status codes: s suppressed, d damped, h history, * valid,
> b7.Ct 474- internal
```

bgp dampening	৷৷
clear ip bgp dampening	৪ Â

35.2.3 show ip bgp community

ৡ community BGP Â

show ip bgp community *community-number* [**exact -match**]

ð Ô

community-number	ʃ Â ù AA:NN(ʃ /2)˘ ≠ ˩ ɅU ɅUЮ ⊮ ' internet˘ no-export˝ local-as˘ no-advertise
exact -match	٦

ð Ô

ð ৡ Ô

ð Ô

ৡ community Â

ð Ô

```
Ruijie# show ip bgp community local-as 111:12345
Status codes: s suppressed, d damped, h history, * valid,
> best, i - internal
Origin codes: i - IGP, e - EGP, ? - incomplete
Status Network     Next Hop     Metric  LocPrf  Path
------ ----------------- --------------   --------
*>  211.21.21.0/24  110.110.110.10  0      1000   200
300
*>  211.21.23.0/24  110.110.110.10  0      1000   200
300
*>  211.21.25.0/24  110.110.110.10  0     1000   300
*>  211.21.26.0/24  110.110.110.10  0     1000   300
*>  211.21.27.0/24  110.110.110.10  0     1000   200
```

35.2.4 show ip bgp community-list

ৡ ৲ BGP Â

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

ð Ô

community-name	⁄
exact-match	৲

ð Ô

ð ৡ Ô

ð Ô

ৡ BGP

ð Ô

```
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
```

ð ৡ Ô

ৡ	
ip community-list	⊮

35.2.5 show ip bgp dampening dampened-paths

ৡ ⁸ Â

show ip bgp dampening dampened-paths

ð Ô

ৡ

ð Ô

ð ৡ Ô

ð Ô

ৡ BGP

ð Ô

```
Ruijie# show ip bgp dampening flap-statistics
Status codes: s suppressed, d damped, h history, * valid,
> best, i - internal
Origin codes: i - IGP, e - EGP, ? - incomplete
Status Network          From          Flaps  Duration
Reuse    Path
------  ------------  ---------  ------ -------- -----
h        192.168.64.0/24     110.110.110.10         2
00:19:17        1000 i
h        201.234.1.0/24      110.110.110.10         2
00:19:17        1000 ?
h        201.234.2.0/23      110.110.110.10         2
00:19:17        1000 ?
h        201.234.2.0/23      110.110.110.10         2
00:19:17        1000 ?
h        201.234.2.0/23      110.110.110.10         2
00:19:17        1000 ?
h        201.234.2.0/23      110.110.110.10         2
00:19:17        1000 ?
```

35.2.7 show ip bgp dampening parameters

ৡ BGP Â

show ip bgp dampening parameters

ð Ô

ৡ

ð Ô

ð ¾ Ô

ð Ô

¾ BGP

ð Ô

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

35.2.8 show ip bgp filter-list

¾ Â

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

ð Ô

path-list-number	/\

ð Ô

ð ¾ Ô

ð Ô

¾

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
```

35.2.9 show ip bgp inconsistent-as

৲ AS Â

show ip bgp inconsistent-as

ð Ô

৲ Â

ð Ô

ð ৲ Ô

ð Ô

৲ AS

ð Ô

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

35.2.10 show ip bgp neighbors

৲ BGP Â

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

ð Ô

neighbor-address	Â
received-routes	ÿ peer ˆ ↓ ˜ Â
routes	peer ↓ Â

advertised-routes	Â

ð ৡ Ô

ð Ô

ৡ ⊿ BGP

ð Ô

```
Ruijie# show ip bgp neighbors
BGP neighbor   : 12.12.12.2
Remote AS    : 100
Local AS     : 100
Neighbor type : internal
BGP version   : 4
Remote ID    : 192.168.4.2
BGP state    : Established, up for 00:53:30
Min advertisement interval(secs): 15
Configured holdtime  : 90
Configured keepalive : 30
Hold time          : 90
keepalive          : 30
Neighbor capabilities     : ignore
Address family IPv4 Unicast: advertised , recieved
Route refresh            : advertised , recieved
Connections established : 1
Connections dropped    : 0
Last reset  : never
Local  host : 12.12.12.1  Local port  : 179
Remote host : 12.12.12.2  Remote port : 1067
Maximum-Prefix limit  : 4294967295
Threshold for warning : 0%
Accepted prefixes    : 0
Prefix advertised    : 6
Received messages     : 110
Sent messages        : 116
Received notifications : 0
Sent notifications    : 0
Route refresh received : 0
Route refresh sent    : 0
```

```
Ruijie# show ip bgp neighbors 15.15.15.5 routes
Status codes: s suppressed, d damped, h history, * valid,
> best, i - internal
Origin codes: i - IGP, e - EGP, ? - incomplete
```

```
Status Network          Next Hop       Metric   LocPrf
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 ?
```

35.2.11 show ip bgp paths

¾ Â

show ip bgp paths

ð Ô

¾

ð ¾ Ô

ð Ô

¾

ð Ô

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

35.2.12 show ip bgp quote-regexp

¾ AS ¬ ¬ Ù BGP Â

show ip bgp quote-regexp *regexp*

ð Ô

regexp	¬ AS Ù Â

ð Ô

ð ¾ Ô

ð Ô

¾ AS ¬ ¬ Ù BGP Â

~

¬ Ù Â

ð Ô

```
Ruijie# show ip bgp quote-regexp "_300_"
Status codes: s suppressed, d damped, h history, * valid,
> best, i - internal
Origin codes: i - IGP, e - EGP, ? - incomplete
Network     Next Hop     Metric  LocPrf  Path
```

```
*>  211.21.21.0/24  110.110.110.10  0      1000   200
300
*>  211.21.23.0/24  110.110.110.10  0      1000   200
300
*>  211.21.25.0/24  110.110.110.10  0     1000   300
*>  211.21.26.0/24  110.110.110.10  0     1000   300
```

35.2.13 show ip bgp regexp

¾ AS ¬ BGP Â

show ip bgp regexp *regexp*

ð Ô

regexp	¬ AS Â

ð Ô

ð ¾ Ô

ð Ô

¾ AS ¬ BGP

ð Ô

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

¾ BGP Â

show ip bgp summary

ð Ô

¾

ð ¾ Ô

ð Ô

¾ BGP

ð Ô

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

ð ¾Ô

¾	
router bgp	BGP

network	Â
neighbor	
summary	ÿ
label	

community-list-number	ᛘ Â
community-list-name	ᛇ

ð Ô

ð ৲ Ô

ð Ô

৲

ð Ô

```
Ruijie# show ip community-list
Community-list standard local
permit local-AS
Community-list standard Red-Giant
permit 0:10
deny 0:20
```

36

36.1

36.1.1 distribute-list in

distribute-list in **no**

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

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

access-list-number	
prefix *prefix-list-name*	
gateway *prefix-list-name*	
i*nterface-type interface-number*	( )

OSPF

OSPF a

ЛЬЮ ˘ RIP ÿ Fastethernet 0/0 ˘
⁸ ˘ ˩ 172.16 Â

```
router rip
network 200.168.23.0
distribute-list/T.Bh fastethernet 0/0
no auto-summary
!
access-list/T.permit/72.16.0.0 0.0.255.255
```

ð ʒ Ô

ʒ	
access-list	Ⱨ
prefix-list	Ⱨ

36.1.2 distribute-listout

⁸ ˘ ˘ Л ˘ ʒ
distribute-listout Â ʒ **no** Ⱨ Â

no distribute-list {[*access-list-number* | *name*] | **prefix** *prefix-list-name*} **out** [*interface* | *protocol* | *process-id*]

ð Ô

access-list-number	Â ˩ ˘ ˩ Л
prefix *prefix-list-name*	
interface	(˩) ↑ ˘ ⁸ ˩
protocol	(˩) ↑ ˘ ↑

ð Ô

⁸ Â

ð ʒ Ô

Â

ð Ô

ʒ a ˩ ˘ ⁸ ’ ˘ ⁸ ˩ ’ è

/ʅ Â ѝ AA:NN(

community-number

ð Ô

network	/l Â

ð Ô

ù 0.0.0.0/0 Â

ð ϡ Ô

Â

ð Ô

ù ˘ **default-network**
ЛЮ ˚ ' a ˘
ل Â

Л“*” /l ˘ Â
connected Ю ˘ Â

ð Ô

ЛЮ ˘ 192.168.100.0 ù ˘
˘ Л ╟ Â

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

ЛЮ ˘ 200.200.200.0 ù ˘ ل
200.200.200.0 ˘ ù Â

```
ip default-network 200.200.200.0
```

ð ϡ Ô

ϡ	
show ip route	IP Â

36.1.5 ip prefix-list

╗ ˘ **ip prefix-list**
ϡ Â ϡ **no** Â

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

prefix-lis-name	ɹ
seq-number	Ɲ ʎ Âè 1 2147483647 Â ϧ ʎ˘ ѝ ϯ ʎ Â ʎ 5˝ ɹ ʎ ʎ 5
deny	ϗ
permit	ϗ
ip-prefix	Ɲ Â ɻ Ɲ IP Â ÿ 0 32
minimum-prefix-length	ˆ ɻ ~ ( ) ' **ge** ϧ
maximum-prefix- length	ˆ ɻ ~ ( ) ' **le** ϧ

ð Ô

Â

ð ϧ Ô

Â

ð Ô

ip prefix-list ϧ IP Â permit deny
ᾱ ϗ Ю ɻ ╠ Â

Ⱶ ϗ ϗ Âge le
Ⱶ ϗ ˘ ip-prefix
╗ ϗ Â ϧ ge le ˘ ip-prefix
ϗ Â ge˘ ϗ
minimum-prefix-length 32 Â le˘ ϗ ip-prefix
maximum-prefix- length Â γ ˘ ϗ
ÿ minimum-prefix-length maximum-prefix- length Â ˘ ip-prefix
à minimum-prefix-length maximum-prefix-length '
ip-prefix < minimum-prefix-length < maximum-prefix-length <=
32 Â

ð Ô

ЛЬЮ ѝ ǂ ˘ OSPF ǂ RIP
ǂ IP ˘ IP
ЊЖ(ѵ IP 201.1.1.0/24 ǂ
)˘ Ю '

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

36.1.6 ip prefix-list description

ѝ ╕ ˘ **ip prefix-list description** ʒ Â
ʒ **no** Â

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

ð Ô

prefix-lis-name	ɻ
descripton-text	

ð Ô

╕

ð ʒ Ô

ð Ô

ЛЬЮ ѝ ǂ ˘ OSPF ǂ RIP
ǂ IP ˘ IP
ЊЖ(ѵ IP ѝ 201.1.1.0/24 ǂ)˘
Ю '

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

ϧ ϔ ϒ **ip prefix-list description** ϗ Â
ϗ **no** ϟ ϔ Â

ip prefix-list sequence-number

ð Ô

ð Ô

ϔ

ð ϗ Ô

ð Ô

ЛЪЮ ϧ ϡ ϒ OSPF ϡ RIP
ϡ IP ϒ IP
ℍ(ϟ IP ÊElìð !4Ôœ-ì•à ë>Ŧ0¡T1,7Ra(qQ[sØ@d<21Á8,$52x7lrd8

permanent	ˆ ˩ ˜
number	ˆ ˩ ˜
disable/enable	ˆ ˩ ˜

ð Ô

Â

ð ʒ Ô

Â

ð Ô

ѝ 1˘ ˘ ˩ Л∪ ╟
˘ ˩ ╟ a ˘ Â
˩ Л∪ ˘ ˘
ѝ ╟ Â OSPF ѝ 110˝ ˩ Л∪
ѝ 125˜ OSPF ˘
˩ Л∪ Э Â

˩ Л∪ vrf˝ ╗ vrf Â

ѝ 1˘ ˩ Л∪ **show ip route weigh**t ʒ
Â weight WCMP ╗ ˘
˩ ˘ ǂ
˘ weight ǂ ˘ ǂ
Â WCMP ⁸ ѝ 32˝
a ˩˘ Л∪ ѐ WCMP ⁸ б ʌ ’
⁸ ˘ ⁸ a Â

⁸ ˘ a Â
˘ ˘ Â

Л∪ ˘ Ю ѝ ˆ ip route 0.0.0.0 0.0.0.0 Fastethernet 0/0˜ Â

```
ip route 172.16.100.0 255.255.255.0 fastethernet 0/0
192.168.12.1Â
```

ð ʒ Ô

ʒ	
show ip route	IP Â

36.1.9 ip routing

RGOS ˚ IP ╖ ˘ Ю ʒ Â ʒ no ┘Л IP ╖ Â

ip routing

no ip routing

ð Ô

IP Â

ð ʒ Ô

ð Ô

┘ й ˘ ┘ й VOIP ˘ ┘Л a RGOS ˚ IP ╖ Â ┘Л RGOS IP ╖ Â

ð Ô

ЛЮ ˘ RGOS ˚ IP ╖ Â

```
no ip routing
```

ð ⅄ Ô

ʒ γ Э a Â

36.1.10 ip static route-limit

Э ˘ ʒ **ip static route-limit** Â ʒ no ┘Л Â

ip static route-limit *number*

ip static route-limit *number*

ð Ô

number	Э ˘ 1-10000

ð Ô

ѝ 1000 Â

ð ʒ Ô

Â

ð Ô

Э ѝ ⁸ ˘ **ip static route-limit** Э ɻ Ю ˘ a Э Â **show running config** ɻ Л Э Â

ð Ô

ЛЮ ˘ Э ѝ 900 ˘ ɻ Â

```
ip static route-limit 900
```

ð ɻ Ô

ʒ γ Э a Â

36.1.11 ipv6 prefix-list

IPv6 ╗ ˘ **ipv6 prefix-list** ʒ Â ʒ **no** Â

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*]

ð Ô

prefix-lis-name	ɻ Â
seq-number	Л ɅÂè 1 2147483647 Â ʒ Ʌ˘ ѝ ɬ Ʌ Â Ʌ 5˝ ɻ Ʌ Ʌ 5
deny	ʔ

36.1.12 ipv6 prefix-list description

и IPv6 ╗ ˘ **ipv6 prefix-list description** ϡ Â ϡ **no** Â

ipv6 prefix-list *prefix-lis-name* **description** *descripton-text*

ð Ô

prefix-lis-name	IPv6 ɻ
descripton-text	IPv6

ð Ô

╗

ð ϡ Ô

ð Ô

ð Ô

ЛЬЮ и ϯ ˘ OSPF ϯ RIP

ϯ IP ˘ IP

ЂЖ(ϰ IP и 201.1.1.0/24 Лb

ð Ô

ЛЪЮ й ǂ ˘ OSPF ǂ RIP
ǂ IP ˘ IP
ЬЖ(ˬ IP й 201.1.1.0/24 ǂ)˘
Ю '

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

36.1.14 match as-path

ǂ

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

36.1.15 match community

˘ ⅃ Л℧ 1 **match** ꝛ 1
set ꝛ Â **match** ꝛ˘ ꝛ ’ **set** ꝛ˘
a Â

ð Ô

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

ð ꝛ Ô

ꝛ	
match as-path	ꝛ AS_PATH
match metric	ꝛ
match origin	ꝛ
set as-path prepend	ᛏ AS_PATH Â
set metric	ᛏ
set metric-type	ᛏ

36.1.16 match interface

ꝛ Ю ѝ ˘ ꝛ **match interface** Â ꝛ **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

interface-type	
interface-number	Л

ð Ô

Â

ð ꝛ Ô

Â

ð Ô

match interface ϧ ʌ ɻ Л Â

ɻ Л ÿ ϯ ʌ ╖ Â ɻ
Л OSPF ϯ ʌ RIP ˘ ≠ ɻ Л RIP
ϯ ʌ OSPF Â

ϯ ˘ ˆ route maps˜ ˘ ч
ϯ ˚ ⁸ Â

˘ ɻ Л 1 **match** ϧ 1
set ϧ Â **match** ϧ˘ ϗ ’ **set** ϧ˘
a Â

ð Ô

ϯ ˘ ɻ Л ϯ Э Â a
˘ è ˘ ɻ ϧ a ɻ Â
ɻ ϯ Э˘ a ɻ ˘ è
ϧ ≠ a ɻ Â

ЛЮ ˘ OSPF ϯ RIP ˘ ɻ ϯ Ю
й fastethernet 0/0 RIP Â

```
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
```

ð ϧ Ô

ϧ	
match ip address	ϗ
match ip next-hop	ϗ Ю
match ip route-source	ϗ
match metric	ϗ
match route-type	ϗ
match tag	ϗ
set metric	ϯ
set metric-type	ϯ
set tag	ϯ

36.1.17 match ip address

† ˘

ϡ **match ip address** Â ϡ **no** Â

match ip address {*access-list-number* [*access-list-number...* | *access-list-name...*] |*access-list-name* [*access-list-number...*| *access-list-name*] | **prefix-list** *prefix-list-name [prefix-list-name...*]}

no match ip address {*access-list-number* [*access-list-number...* | *access-list-name...*] | *access-list-name* [*access-list-number...*| *access-list-name*] | **prefix-list** *prefix-list-name* [*prefix-list-name...*]}

ð Ô

access-list-number	Ⲙ
access-list-name	ⲗ
prefix-list *prefix-list-name*	ϩ ⲗ

ð Ô

Â

ð ϡ Ô

Â

ð Ô

match ip address ϡ ⲘⲘ ⲗ Ⲗ Ⲙ Ⲙ ⲗ Â

ⲗ Ⲗ ÿ † ⲘⲘ ╖ Â ⲗ Ⲗ OSPF † ⲘⲘ RIP ˘ ≠ ⲗ Ⲗ RIP † ⲘⲘ OSPF Â † ⲗ Ⲗ IP Â

† ˘ ^ route maps˜ ˘ ч † ˘ ⁸ Â

˘ ⲗ Ⲗ 1 **match** ϡ 1 **set** ϡ Â **match** ϡ˘ ϩ ’ **set** ϡ˘ a Â

ð Ô

† ˘ ⲗ Ⲗ † Э Â a ˘ è ˘ ⲗ ϡ a ⲗ Â

ﻝ ꝉ Э˘ a ﻝ ˘ è
ꝛ ≠ a ﻝ Â

ЛЬЮ ˘ OSPF ꝉ RIP ˘ ﻙ ꝉ
10 RIP ˘ OSPF ˘ ꞑ
type-1˘ ꞑ 40 Â

```
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
```

ð ꝛ Ô

ꝛ	
access-list	Ⱶ
match interface	ꟾ Ю
match ip next-hop	ꟾ Ю
match ip route-source	ꟾ
match metric	ꟾ
match route-type	ꟾ
match tag	ꟾ
set metric	ꝉ
set metric-type	ꝉ
set tag	ꝉ

36.1.18 match ip next-hop

ꝉ Ю IP ˘
ꝛ **match ip next-hop** Â ꝛ **no** Â

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...*]}

ð Ô

access-list-number	Ѝ
access-list-name	ɻ
prefix-list *prefix-list-name*	ϩ ɻ

ð Ô

Â

ð ϧ Ô

Â

ð Ô

match ip next-hop ϧ ɻ ɹЛ Ѝ ɻ Â

ɹЛ ÿ ϯ ɻ ℼ Â
ɹЛ OSPF ϯ ɻ ℼ Â ɹЛ
OSPF ϯ ɻ RIP ˘ ≠ ɹЛ RIP
ϯ ɻ OSPF Â ϯ ɹ
Л IP Â

ϯ ˘ ˆ route maps˜ ˘ ч
ϯ ˚ ⁸ Â

˘ ɹЛ 1 **match** ϧ 1
set ϧ Â **match** ϧ˘ ϩ ’ **set** ϧ˘
a Â

ð Ô

ЛЮ ˘ OSPF ϯ RIP Â ɹ RIP Ю
10 20˝ OSPF è ϯ Â

```
router ospf
redistribute rip subnets route-map redrip
network 192.168.12.0 0.0.0.255 area 0
access-list 10 permit 192.168.100.1
access-list 20 permit 172.16.10.1
route-map redrip permit 10
match ip next-hop 10 20
```

ð ϧ Ô

ϧ	

match ip address	٦
match interface	٦ ЮO
match ip route-source	٦
match metric	٦
match route-type	٦
match tag	٦
set metric	٭
set metric-type	٭
set tag	٭

36.1.19 match ip route-source

٭ IP ˘
ٶ **match ip route-source** Â ٶ **no**
Â

match ip route-source {*access-list-number* [*access-list-number...* | *access-list-name...*] |*access-list-name* [*access-list-number...*| *access-list-name*] | **prefix-list** *prefix-list-name [prefix-list-name...*]}

no match ip route-source {*access-list-number* [*access-list-number...* | *access-list-name...*] | *access-list-name* [*access-list-number...*| *access-list-name*] | **prefix-list** *prefix-list-name* [*prefix-list-name...*]}

ð Ô

access-list-number	٨
access-list-name	٨
prefix-list *prefix-list-name*	٦ ٨

ð Ô

Â

ð ٶ Ô

Â

ð Ô

match ip route-source ٶ ٨ ٨ ٨ ٨ Â

ɻ Л υ ÿ ɬ ɻ ╖ Â ɻ
Л υ OSPF ɬ ɻ RIP ˘ ≠ ɻ Л υ RIP
ɬ ɻ OSPF Â ɬ ɻ
Л υ IP Â

ɬ ˘ ˆ route maps˜ ˘ ч
ɬ ˚ ⁸ Â

˘ ɻ Л υ 1 **match** ʒ 1
set ʒ Â **match** ʒ˘ ¬ ’ **set** ʒ˘
a Â

ð Ô

Л υ Ю ˘ OSPF ɬ RIP

match ipv6 address { *access-list-name* | **prefix-list** *prefix-list-name* }

no match ipv6 address

ð Ô

access-list-name	ɻ
prefix-list *prefix-list-name*	ɔ IPv6 ɻ

ð Ô

Â

ð ʒ Ô

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ð Ô

ɻ Л υ ÿ ɬ ʎ ╖ Â ɻ Л υ OSPF ɬ ʎ RIP ˘ ≠ ɻ Л υ RIP ɬ ʎ OSPF Â ɬ ɻ Л υ IP Â

ɬ ˘ ˆ route maps˜ ˘ ч ɬ ˚ ª Â

˘ ɻ Л υ 1 **match** ʒ 1 **set** ʒ Â **match** ʒ˘ ɔ ' **set** ʒ˘ a Â

ð Ô

ɬ ˘ ɻ Л υ ɬ Э Â a ˘ è ˘ ɻ ʒ a ɻ Â ɻ ɬ Э˘ a ɻ ˘ è ʒ ≠ a ɻ Â

ЛυЮ ˘ OSPF ɬ RIP ˘ ɻ ɬ 10 RIP ˘ OSPF ˘ й type-1˜ й 40 Â

```
ipv6 router ospf
redistribute rip subnets route-map redrip
ipv6 access-list v6acl
10 permit ipv6 2620::/64 any
route-map redrip permit 10
match ipv6 address v6acl
set metric 30
```

ð ϧ Ô

ϧ	
ipv6 access-list	ЬЖ IPv6
match interface	┐ Ю
match ipv6 next-hop	┐ IPv6 Ю
match ipv6 route-source	┐ IPv6
match metric	┐
match route-type	┐
match tag	┐
set metric	┼
set metric-type	┼
set tag	┼

36.1.21 match ipv6 next-hop

┼ Ю IPv6

˘ ϧ **match ipv6 address** Â ϧ **no** Â

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

no match ipv6 next-hop

ð Ô

access-list-name	┘
prefix-list *prefix-list-name*	┐ IPv6 ┘

ð Ô

Â

ð ϧ Ô

Â

ð Ô

┘ Л Ъ ÿ ┼ ┤ ╖ Â

match ipv6 route-source

36.1.22 match ipv6 route-source

ϯ Ю IPv6
˘ ϡ **match ipv6 address** Â ϡ **no**
Â

match ipv6 route-source { *access-list-name* | **prefix-list** *prefix-list-name* }

no match ipv6 route-source

ð Ô

access-list-name	ɻ
prefix-list *prefix-list-name*	ϩ IPv6 ɻ

ð Ô

Â

ð ϡ Ô

Â

ð Ô

ɻ Л υ ÿ ϯ ϰ ╗ Â ɻ
Л OSPF ϯ ɻ RIP ˘ ≠ ɻ Л RIP
ϯ ɻ OSPF Â ϯ ɻ
Л IP Â

ϯ ˘ ^ route maps˜ ˘ ч
ϯ ˚ ⁸ Â

˘ ɻ Л 1 **match** ϡ 1
set ϡ Â **match** ϡ˘ ϩ ' **set** ϡ˘
a Â

ð Ô

ϯ ˘ ɻ Л ϯ Э Â a
˘ è ˘ ɻ ϡ a ɻ Â
ɻ ϯ Э˘ a ɻ ˘ è
ϡ ≠ a ɻ Â

ЛЮ ˘ OSPF ϯ RIP ˘ ɻ ϯ
10 RIP ˘ OSPF ˘ й
type-1˘ й 40 Â

```
ipv6 router ospf
redistribute rip subnets route-map redrip
ipv6 access-list v6acl
10 permit ipv6 5200::/64 any
route-map redrip permit 10
match ipv6 route-source v6acl
set metric 50
```

ð ʅ Ô

ʅ	
ipv6 access-list	ꟸ IPv6
match interface	ᄀ Ю
match ipv6 address	ᄀ IPv6 Ю
match ipv6 route-source	ᄀ IPv6
match metric	ᄀ
match route-type	ᄀ
match tag	ᄀ
set metric	ᛏ
set metric-type	ᛏ
set tag	ᛏ

36.1.23 match length

IP ˘ ʅ **match length** Â ʅ **no** ˧Љ ꟸ Â

match length *min-length max-length*

no match length *min-length max-length*

ð Ô

min-length	IP
max-length	IP

ð Ô

Â

ð ʅ Ô

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˘ α Ю Â

˘ ˘ ɜ Â

˘ Ѭ 1 ɔ

Â ⊿˘

˘ a ˘

Ѭ Â

˘ ǂ a ⊿ ˘ ⊿Л

Â

ð Ô

ЛЮ ˘ serial 1/0 ˘ 500

˘ ÿ fastethernet 1/0 Â

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

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

ð ʒ Ô

ʒ	
route-map	Ѭ
match ip address	ɔ
set default interface	˘
set interface	
set ip default next-hop	Ю IP ˘
set ip next-hop	Ю IP
set ip precedence	IP ˝I

36.1.24 match metric

ɔ ˘ ʒ **match metric** Â ʒ **no** Â

match metric *metric*

no match metric

ð Ô

match ip next-hop	┐ ЮО
match ip route-source	┐
match route-type	┐
match tag	┐

set[[match(r)Tj/C2_0 1 Tf0 Tc 0 Tw 14.663 0.017 Td1412135447A107DA13D7143C32B0

ò Ô ò ã Ô ò Ô

```
match origin incomplete
set community no-export
```

ð ৡ Ô

ৡ	
match as-path	ৗ AS_PATH
match metric	ৗ
match origin	ৗ
set as-path prepend	¦ AS_PATH
set metric	¦
set origin	¦

36.1.26 match route-type

ৗ ˘ ৡ **match route-type** Â
ৡ **no** Â

match route-type {**local | internal | external** [**type-1 | type-2**] **| level-1 | level-2**}

no match route-type {**local | internal | external** [**type-1 | type-2**] **| level-1 | level-2**}

ð Ô

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

ð Ô

Â

ð ৡ Ô

Â

ð Ô

ɹ Л υ ÿ ↑ ∧ ╖ Â ɹ
Л υ OSPF ↑ ∧ RIP ˘ ≠ ɹ Л υ RIP
↑ ∧ OSPF Â ↑ ɹ
Л υ IP Â

↑ ˘ ^ route maps˜ ˘ ч
↑ ˚ ⁸ Â

˘ ɹ Л υ 1 **match** ʒ 1
set ʒ Â **match** ʒ˘ ך ’ **set** ʒ˘
a Â

ð Ô

Л υ Ю ˘ RIP ↑ OSPF ÂRIP ɹ ↑ OSPF
Â

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

route-map redrip permit 10
match route-type internal
```

ð ʒ Ô

ʒ	
access-list	Ⱶ
match ip address	ך
match interface	ך Ю
match ip next-hop	ך Ю
match ip route-source	ך
match metric	ך
match tag	ך
set metric	↑
set metric-type	↑
set tag	↑

36.1.27 match tag

ך ˘ ʒ **match tag** Â ʒ **no**
Â

match tag *tag* [*…tag*]

no match tag *tag* [*…tag*]

ð Ô

tag	

ð Ô

Â

ð ϛ Ô

Â

ð Ô

match tag ϛ ʎ ɹ ʃƱ tag Â

ɹ ʃƱ ÿ ɻ ʎ Â ɹ ʃƱ
OSPF ɻ ʎ RIP ˘ ≠ ɹ ʃƱ RIP
ɻ ʎ OSPF Â ɻ ɹ ʃƱ

match interface	┐ Ю
match ip route-source	┐
match metric	┐
match ip next-hop	┐ Ю
match route-type	┐
set metric	┼
set metric-type	┼
set tag	┼

36.1.28 maximum-paths

maximum-paths
no

36.1.29 route-map

route-map

no

route-map *route-map-name* [**permit** | **deny**] [*sequence-number*]

no route-map *route-map-name* [**permit** | **deny**] [*sequence-number*]

route-map-name	
permit	permit match set set a match
deny	deny match a a deny a match set
sequence-number	

RGIOS

ɻ Л υ ÿ ɬ ʌ ╖ Â ɻ
Л υ OSPF ɬ ʌ RIP ˘ ≠ ɻ Л υ RIP
ɬ ʌ OSPF Â ɬ ɻ
Л υ IP Â

ɬ ˘ ˆ route maps˜ ˘ ч
ɬ ˚ ⁸ Â

˘ ɻ Л υ 1 **match** ʒ 1
set ʒ Â **match** ʒ˘ ¬ ' **set** ʒ˘
a Â

˘ ʌ ЛЮ '

1) ˘ *sequence-numbeř*
ѝ 10ʼ 10 IP

ð ৡ Ô

ৡ	
Redistribute	⍞

36.1.30 set aggregator as

ৗ match AS ˘
ৡ **set aggregator as** Â ৡ **no** Â
ৡ Â

set aggregator as *as-num ip_addr*

no set aggregator as [*as-num ip_addr*]

ð Ô

as-number	AS ⁄
ip_addr	

ð Ô

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ð Ô

ৡ BGP ˘ Â
ৡ ˩ ˆ as,ip-addr˜ ˘ a ˩

set community	ᚋ COMMUNITY
set metric	ᚋ
set metric-type	ᚋ

36.1.31 set as-path prepend

ᚏ match ᚗ AS_PATH ᚘ
ৡ **set as-path prepend** Â ৡ **no** Â
ৡ Â

set as-path prepend *as-number*

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

ð Ô

as-number	ᚗ AS_PATH AS ᚌ

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ৡ ᚏ ᚗ AS_PATH

ᚍᚎ as-path ᚗ 15 as Â

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```
route-map set-as-path
match as-path 1
set as-path prepend 100 101 102
```

ð ৡ Ô

ৡ	
match as-path	ᚏ AS_PATH
match community	ᚏ
match metric	ᚏ
match origin	ᚏ
set community	ᚋ COMMUNITY
set metric	ᚋ

ð ৡ Ô

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

36.1.33 set community

ৗ match COMMUNITY ˘
ৡ **set community** Â ৡ **no** Â ৡ
Â

set community {*community-number*[*community-number …*] ¦**additive**

```
match as-path 1
set community 109:10

route-map SET_COMMUNITY 20 permit
match as-path 2
set community no-export
```

ð ৡ Ô

ৡ	
match as-path	৲ AS_PATH
match community	৲
match metric	৲
match origin	৲
set as-path prepend	৴ AS_PATH
set origin	৴
set metric-type	৴

36.1.34 set dampening

৲ match ˘ ৡ **set dampening** Â ৡ **no** Â ৡ Â

set dampening *half-life reuse suppress max-suppress-time*

no set dampening

ð Ô

half-life	৶ a ৶ Â 1..45(৴)˘ ˙ 15৴
reuse	æ ˘ ⁸ Â 1..20000˘ ˙ 750 Â
suppress	˘ ⁸ Â 1..20000˘ 2000 Â
max-suppress-time	⁸ Â 1..255(৴)˘ ˙ 4* half-life

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

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

ð ৡ Ô

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

36.1.35 set extcommunity

ৗ match ˘
ৡ **set extcommunity** Â ৡ **no** Â ৡ
Â

set extcommunity {**rt** *extend-community-value* | **soo** *extend-community-value*}

no set extcommunity {**rt** | **soo**}

ð Ô

rt	RT
soo	SOO

extend-community-value	

ip-address	Ю IP
weight	Ю

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set ч ' WCMP ˘ WCMP
Â Ю˘ weight
WCMP Â

set ip default next-hop Л Л Ло IP ˘ a 32 Â

Ьd~92t VQ25 Q/Ї" ãЋ>' ЂЎUÿQN0,€WCMP Q Q >5E¤> õ ã ÈWCMP Q Q Câ³ãTZЬâ

```
access-list 1 permit ip 1.1.1.1 0.0.0.0
access-list 2 permit ip 2.2.2.2 0.0.0.0

interface async 1
ip policy route-map equal-access

route-map equal-access permit 10
match ip address 1
set ip default next-hop 6.6.6.6
route-map equal-access permit 20
match ip address 2
set ip default next-hop 7.7.7.7
route-map equal-access permit 30
set default interface null0
```

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ৡ	
route-map	⊮
match ip address	ৗ

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ð ϡ Ô

ϡ	
route-map	Ⱶ
match ip address	ϩ
set default interface	˘
set default interface	˘
set interface	
set ip default next-hop	ⱧO IP ˘
set ip precedence	IP ˝I

36.1.38 set ip next-hop

ϩ match ⱧO IP ˘
ϡ **set ip next-hop** Â ϡ **no** Â ϡ
Â

set ip next-hop *ip-address* [*weight*] [*…ip-address* [*weight*]]
no set ip next-hop *ip-address* [*weight*] [*…ip-address* [*weight*]]

ð Ô

ip-address	ⱧO IP
weight	ⱧO

ð Ô

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ð ϡ Ô

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ð Ô

set ϡ ч ' WCMP ˘ WCMP
Â Ю˘ weight
WCMP Â

set ip next-hop ϡ л ⅄Л IP ˘ a 32 Â

ip address л ╗ weight ˘ ⅄Л a 4
nexthop Â

˘ next-hop л weight ˘ **set** ϡ
╟╞ ий WCMP Â WCMP
Ю˘ weight nexthop ˘ è weight
ий 1 Â

ϡ ⅄Л ┐ a ⅄ match ˘ a ⅄ Â

╗
⁸ Â ˘ ᾱ
˘ ᾱ Ю Â

˘ ˘ з Â
˘ ⊮ 1 ┐
Â л˘
˘ a ˘
⊮ Â

⅄Л set Â

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ЛЮ ˘ serial 1/0 Э Â
10.0.0.0/8 ˘ 192.168.100.1'
ий 172.16.0.0/16 ˘ 172.16.100.1' è
Â

```
interface serial 1/0
ip policy route-map load-balance

access-list 10 permit 10.0.0.0 0.255.255.255
access-list 20 permit 172.16.0.0 0.0.255.255

route-map load-balance permit 10
match ip address 10
set ip  next-hop 192.168.100.1

route-map load-balance permit 20
match ip address 20
set ip  next-hop 172.16.100.1

route-map load-balance permit 30
set interface Null0
```

ð ϡ Ô

ϡ	
route-map	⊮
match ip address	ϩ
set default interface	˘
set default interface	˘
set interface	
set ip default next-hop	⊮O IP ˘
set ip precedence	IP ″l

36.1.39 set ip next-hop verify-availability

⊮O IP ˩ ˘ ϡ **set ip next-hop verify-availability** Â ϡ **no** /C[illegible]

```
ip policy route-map load-balance

access-list 10 permit 10.0.0.0 0.255.255.255
access-list 20 permit 172.16.0.0 0.0.255.255

route-map load-balance permit 10
match ip address 10
set ip  next-hop 192.168.100.1

route-map load-balance permit 20
match ip address 20
set ip  next-hop 172.16.100.1

route-map load-balance permit 30
set interface Null0
```

ð ϡÔ

ϡ	
route-map	Ⱶ
match ip address	ϩ
set default interface	˘
set default interface	˘
set interface	
set ip default next-hop	Ю IP ˘
set ip precedence	IP ″I

36.1.40 set level

ϩ match ϣ ˘
ϡ **set level** Â ϡ **no** Â

set level {**level 1**| **level 2** | **level 1-2** | **stub-area** | **backbone**}

no set level

ð Ô

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ЛЬЮ ˘ OSPF ϯ RIP backbone ш Â

```
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
```

ð ϗ Ô

ϗ	
match interface	ϩ Ю
match ip address	ϩ
match ip next-hop	ϩ Ю
match ip route-source	ϩ
match metric	ϩ
match route-type	ϩ
match tag	ϩ
set metric-type	ϯ
set tag	ϯ

36.1.41 set local-preference

ϩ match LOCAL_PREFERENCE ˘
ϗ **set local-preference** Â ϗ **no** Â

set local-preference *number*

no set local-preference

ð Ô

number	″I Â ' 0..4294967295

ð Ô

Â

ð ϗ Ô

match tag	

set metric-type

set tag

```
route-map redrip permit 10
set metric-type type-1
```

ð ϡ Ô

ϡ	
match interface	ϩ ЮO
match ip address	ϩ
match ip next-hop	ϩ ЮO
match ip route-source	ϩ
match metric	ϩ
match route-type	ϩ
match tag	ϩ
set metric	ϯ
set tag	ϯ

36.1.44 set next-hop

ϩ match ЮO IP ˘
ϡ **set next-hop** Â ϡ **no** Â ϡ
Â

set next-hop *ip-address*

no set next-hop *ip-address*

ð Ô

i*p-address*	ЮO IP

egp	EGP
igp	IGP
Incomplete	a

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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
```

ð Ô

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

36.1.46 set originator-id

match

set originator-id Â **no** Â

set originator-id *ip-addr*

no originator-id [*ip-addr*]

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tag	ʈ

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a ⅄ Â

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ЛЪЮ ˇ OSPF ʈ RIP ˇ ʈ
ѝ 100 Â

```
router ospf
redistribute rip subnets route-map redrip
network 192.168.12.0 0.0.0.255 area 0
route-map redrip permit 10
set tag 100
```

ð ʒ Ô

ʒ	
match interface	ㄱ Ю
match ip address	ㄱ
match ip next-hop	ㄱ Ю
match ip route-source	ㄱ
match metric	ㄱ
match route-type	ㄱ
match tag	ㄱ
set metric	ʈ
set metric-type	ʈ

36.1.48 set weight

ᒣ match BGP ˘ ʒ
set weight Â ʒ **no** Â

set weight *number*

no set weight

ð Ô

number	Â ' 0…65535

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ʒ ᒡ BGP Â

ЮЎ ÿ ˘ neighbor weight
, 32768 Â

ᒡ Л Ъ ʒ BGP ᒣ Â

ð Ô

ЛЪЮ ˘ BGP in Э ˘ ÿ
1.1.1.1 й 100 Â

```
router bgp 1
neighbor 1.1.1.1 route-map nei-rmap-in in
route-map nei-rmap-in permit 10
set weight 100
```

ð ʒ Ô

ʒ	
match as-path	ᒣ AS_PATH
match community	ᒣ
match metric	ᒣ
match origin	ᒣ
set community	ᒣ COMMUNITY
set metric	ᒣ

set metric-type	

36.1.49 ip ref ecmp load-balance source

ECMP/WCMP

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

Hash

HASH 2 CRC32_Upper

CRC32_Lower KEY

ˇ ৡ **show route-map** Â

show route-map *route-map-name*

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route-map-name	ˆ ৸ ˜ ৸

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```
Ruijie# show route-map
route-map AAA, permit, sequence 10
Match clauses:
ip address 2
Set clauses:
metric 10
```

route-map	৶
permit	permit
sequence 10	৴
Match clauses	৷ Â permit deny ɑ set
Set clauses	৷ match ৭ ৶

36.2.2 show ip community-list

ৡ Â

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

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community-list-number	⁄ Â
community-list-name	⁄

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```
Ruijie# show ip community-list
Community-list standard local
permit local-AS
Community-list standard Red-Giant
permit 0:10
deny 0:20
```

36.2.3 show ip prefix-list

˘ **show ip prefix-list**

ৡ Â

show ip prefix-list [*prefix-name*]

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prefix-name	⁄

ð Ô

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```
Ruijie# show ip prefix-list
ip prefix-list pre: 2 entries
seq 5 permit 192.168.64.0/24
seq 10 permit 192.2.2.0/24
```

36.2.4 show ip route

IP ˘ **show ip route** ʒ Â

show ip route [[**vrf** *vrf_name*] [*network* [*mask*] | **count** | **protocol** [*process-id*] | **weight**]]

ð Ô

vrf *vrf_name*	^ ɻ ~ ɬ VRF
network	^ ɻ ~ ɬ
mask	^ ɻ ~ ɬ
count	^ ɻ ~
protocol	^ ɻ ~ ' **connected**, **static**' ˘ Ю ' **bgp**, **isis**, **ospf**, **rip**
process-id	^ ɻ ~ /ɬ
weight	^ ɻ ~ ɬ

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ЛЮ й **show ip route** ʒ '

```
Ruijie# show ip route
Codes:  C - connected, S - static, R - RIP, B - BGP
O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external
type 2
E1 - OSPF external type 1, E2 - OSPF external type 2
i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2
- IS-IS level-2
ia - IS-IS inter area, * - candidate default

Gateway of last resort is no set                IS-IS
S    20.0.0.0/8 is directly connected, VLAN 1
S    22.0.0.0/8 [1/0] via 20.0.0.1
O E2 30.0.0.0/8 [110/20] via 192.1.1.1, 00:00:06, VLAN
1
R    40.0.0.0/8 [120/20] via 192.1.1.2, 00:00:23, VLAN
1
B    50.0.0.0/8 [120/0] via 192.1.1.3, 00:00:41
C    192.1.1.0/24 is directly connected, VLAN 1
C    192.1.1.254/32 is local host.
```

show ip route ЮО'

O	Â ┘ ┤ и' C' ' S' ' R' RIP ' B' BGP ' O' OSPF ' i' IS-IS Â
E2	Â ┘ ┤ и' E1' OSPF ˝ ' E2' OSPF ˇ ' N1' OSPF NSSA 1' N2' OSPF NSSA 2' IA' OSPF ' IS-ISCÃÄ

Via 20.0.0.1	Ю IP
00:00:06	
VLAN 1	Ю

ЛЬЮ й **show ip route** *network*

```
Ruijie# show ip route 30.0.0.0
Routing entry for 30.0.0.0/8
Distance 110, metric 20
Routing Descriptor Blocks:
*192.1.1.1, 00:01:11 ago, via VLAN 1, generated by OSPF,
extern 2
```

show ip route *network* Ю

IPv6 Â

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

adj_nodes	
res_adj	

37

37.1

37.1.1 ip policy route-map

˘ ʅ **ip policy route-map** Â
ʅ **no** Â

ip policy route-map *route-map*

no ip policy route-map

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route-map	ɺ Â

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⁸ ' ACL ACL˘ a
ɺ ACL Â Э ⁸ Â

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˘ ʎ ˝l Â

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ЛЬЮ ˘ Лъ FE0 ˘
ѝ 10.0.0.1˘ Ю ѝ 196.168.4.6˘ ѝ 20.0.0.1
Ю ѝ 196.168.5.6˘ Â

```
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
```

ð ʒ Ô

ʒ	
access-list	Ѭ Â
route-map	Ѭ Â
set ip next-hop	Ѭ Ю
set ip default next-hop	Ѭ Ю
set ip dscp	IP DSCP
match ip address	
match length	ʔ

' route-map ʒ ê ʒ Ì

37.1.2 ip policy

set ip nexthop ˘
Ю **ip policy** Â ʒ **no**
Â

ip policy {**load-balance|redundance**}

no ip policy

ð Ô

38 IPv6

38.1

IPv6 ЛЬЮ ३'

- **ping ipv6**
- **ipv6 address**
- **ipv6 enable**
- **ipv6 hop-limit**
- **ipv6 neighbor**
- **ipv6 source-route**
- **ipv6 route**
- **ipv6 ns-linklocal-src**
- **ipv6 nd ns-interval**
- **ipv6 nd reachable-time**
- **ipv6 nd prefix**
- **ipv6 nd ra-lifetime**
- **ipv6 nd ra-interval**
- **ipv6 nd ra-hoplimit**
- **ipv6 nd ra-mtu**
- **ipv6 nd managed-config-flag**
- **ipv6 nd other-config-flag**
- **ipv6 nd dad attempts**
- **ipv6 nd suppress-ra**
- **ipv6 redirects**
- **clear ipv6 neighbors**
- **tunnel destination**
- **tunnel mode ipv6ip**
- **tunnel source**
- **tunnel ttl**

38.1.1 ping ipv6

ˀ IPV6 Â

ping ipv6 [*ipv6-address*]

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ipv6-address '

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ˀ a ˘ ˩ ΠU é
Â ping /ˡ Ⱨ Ю'

/ˡ	Ⱨ
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U	ў
R	
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A	
D	Down IPV6 ╖ (ă)
?	

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```
Ruijie# ping ipv6 fec0::1
```

38.1.2 ipv6 address

ὶ IPV6 , ˀ no
Â

ipv6 address *ipv6-prefix*/*prefix-length* [**eui-64**]

no ipv6 address [*ipv6-prefix*/*prefix-length*] [**eui-64**]

ð Ô

ipv6-prefix ' IPV6 , RFC2373 Ⱨ ˘
/ˡ ˘ ´ 16 ˘ Ὼ ⁸

prefix-length ' IPV6 IPV6 ˀ ˦ Â

~

S86 IPv6 [0,64] [128,128] Â

eui-64 ' IPV6 64 ID

ð ʒ Ô

ð Ô

eui-64 й 64 IPV6
з й Up ж й ╠ Â

no ipv6 address a é ˘ ж
Â

no ipv6 address ipv6-*prefix*/*prefix-length* **eui-64** ┘Л
ʒ **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;X
```

IPv6 ╖ ˘
Â

ipv6 enable

no ipv6 enable

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IPv6 ╖ Â

ð ʒ Ô

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2 ┘Л Э IP
ʒ, γ Ю IP

' Э IPv6 ⌘ IPv6 ╖ ╟ ˘

hardware-address ' ˘ Л∪ XXXX.XXXX.XXXX
48 Æ MAC ˘ 'X' Ὼ ⁸

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ð Ô

३ ARP ३˘ ৸ IPV6 Э˘

NDP ˘ ѫ ╟
╟ ѝ Â Reachble Â

clear ipv6 neighbors ३ ╟ (NDP)
Â

show ipv6 neighbors ३ Â

ð Ô

```
Ruijie(conifg)# ipv6 neighbor 2001::1 vlan 1
00d0.f811.1111
```

ð ३ Ô

३	
show ipv6 interface	
clear ipv6 neighbors	╟

38.1.6 ipv6 source-route

३ IPv6 ˘ ३ no
IPv6 ⌐ 9 - ṉ Ô ð

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й 0 ' ↓ Ь ˘ Л
Ю IPv6 ˘ Ÿ
0 IPv6 Â

ð Ô

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

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38.1.7 ipv6 route

ֽ IPV6 ˘ ֽ no
Â

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*]}

ð Ô

ipv6-prefix ' IPV6 /ˇ RFC2373
prefix-length IPV6 ˘ ╗ Э'/'

~

S86 [0,64] [128,128] Â

---

ipv6-address ' Ю ˘ RFC2373
ÂЮ ↓Л Ю ↓ Â
Ю ˘ ж Â

interface-id ' ˘
Ю ˘ ж й
Эˇ Â
Ю ˘ ж Â

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, з Ю ≠
Â Ю a ˘
Ю ˘ жЮ ┐
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```
Ruijie(config)# ipv6 route 2001::/64 vlan 1 2005::1
```

ð ʒ Ô

ʒ	
show ipv6 route	IPV6

38.1.8 ipv6 ns-linklocal-src

ʒ˘ ѝ Â
ľ **no ipv6 ns-linklocal-src** Ł˘ ѝ
Â

ipv6 ns-linklocal-src

no ipv6 ns-linklocal-src

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˘ Л∪ ѝ Â

ð ʒ Ô

ð Ô

ð Ô

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

38.1.9 ipv6 nd ns-interval

ʒ Э (NS) ˘ ʒ no
Â

ipv6 nd ns-interval *milliseconds*

no ipv6 nd ns-interval

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milliseconds ' ˘ Л∪ ̀й Æ˘ '
1000-4294672953600000

ð Ô

Ѓ (RA) ̀й 0( )˘
̀й ̀й 1000ms(1)

ð ٪ Ô

ð Ô

Ѓ (RA) ˘ ↓ ≠
Â a Â

ð Ô

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

ð ٪ Ô

٪	
show ipv6 interface	

38.1.10 ipv6 nd reachable-time

٪ Э NDP ╠ ↓ Л˘
̀й ↓ ˘ ٪ no

ipv6 nd reachable-time *milliseconds*

no ipv6 nd reachable-time

ð Ô

milliseconds ' ̀й ↓ ˘ Л∪ ̀й Æ˘ '
0-3600000

ð Ô

Ѓ (RA) ̀й 0( )˘
̀й ̀й ↓ ̀й 30000ms(30)

ð ٪ Ô

ð Ô

a ٮ ˘ ٮ

Л∪ ˘ à

Â a Â

Ѽ (RA) ˘ ٮ ≠

Â и 0 ˘ Â

RFC4861 ˘ ٮ Э

╟˘ 0.5 1.5 Â

ð Ô

```
Ruijie(conifg-if)# ipv6 nd reachable-time 1000000
```

ð ٶ Ô

ٶ	
show ipv6 interface	

38.1.11 ipv6 nd prefix

ٶ Ѽ (RA) ˘ ٶ

no Â

ipv6 nd prefix *ipv6-prefix*/*prefix-length* | **default** [[*valid-lifetime preferred-lifetime*] | [**at** *valid-date preferred-date*] | **infinite** | **no-advertise**]] [**off-link**] [**no-autoconfig**]

no ipv6 nd prefix *ipv6-prefix/prefix-length* | **default** { [**off-link**] [**no-autoconfig**] | [**no-advertise**] }

ð Ô

ipv6-prefix ' IPV6 Л˘ RFC2373

prefix-length ' IPV6 ˘ ╗ Э'/'

valid-lifetime ' ў Ѽ Л и Â

preferred-lifetime ' ў Ѽ Л и

at *valid-date preferred-date* ' Ѽ ˘

Л∪ à à à à↑ Â

infinite '

default '

no-advertise' a Ѽ

off-link ' ў IPV6 ٦ ѫ
ѝ ٮ (on-link) Э ٮ Â
a on-link Â

no-autoconfig ' ў Ѽ a
╟

ð Ô

Ѽ Э IPV6 address ٪ Â
Ѽ Ю:

valid-lifetime: 2592000 (30)

preferred-lifetime: 604800 (7),

Ѽ ˘ з ٮ Л∪ on-link ˘ ٮ Л∪ ╟

ð ٪ Ô

ð Ô

٪ ٮ Л∪ ˘ Ѽ
˘ Ю Ѽ (RA)Ѽ Э ipv6
address ٪ ˘ ╗ è ٮ Л∪ ٪
Â

ipv6 nd prefix default

Э ˘ ╗ ˘
˘ ѫ ipv6 nd prefix default ѝ
Â ѝ Л∪ Л a Ѧ ѝ
Â Л∪ Л ipv6 nd prefix default ٮ a
˘ ٮ Â

at *valid-date preferred-date*

2 ' Ѽ
' Л ˘ ѫ Ѽ
˘ ѝ 0 Â

ð Ô

SVI 1 Э ╗

```
Ruijie(conifg)#interface vlan 1
Ruijie(conifg-if)# ipv6 nd prefix 2001::/64 infinite
2592000
```

SVI 1 Э (a ٮ ╟)

```
Ruijie(conifg)# interface vlan 1
Ruijie(conifg-if)# ipv6 nd prefix default no-autoconfig
```

Ю ╗ ˘ a ˘ ѫ
≠ a ⅃ ╟ Â

ð ٪ Ô

٪	
show ipv6 interface	ra-info

38.1.12 ipv6 nd ra-lifetime

٪ Э Ѽ (RA) ľ Ĕ
٪ no Â

ipv6 nd ra-lifetime *seconds*

no ipv6 nd ra-lifetime

ð Ô

seconds ' ѝ Э ˘ 0-9000 Â

ð Ô

1800

ð ٪ Ô

ð Ô

“ ” Ѽ (RA) ˘
Э ў ⅃Л ѝ Â ѝ
0 a Ѧ Â 0
Ѽ (RA) (ra-interval) Â

ð Ô

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

ð ٪ Ô

٪	
show ipv6 interface	ra-info
ipv6 nd ra-interval	Ѽ
ipv6 nd ra-hoplimit	Ѽ
ipv6 nd ra-mtu	Ѽ MTU

38.1.13 ipv6 nd ra-interval

ʒ Э Ώ (RA) ˘

38.1.14 ipv6 nd ra-hoplimit

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

ð ৡ Ô

ৡ	

show ipv6 interface

٪	
show ipv6 interface	

38.1.18 ipv6 nd suppress-ra

٪ ⁸ Э Ѽ (RA) ˘ ٪ no ÿ Ѽ (RA) Â

ipv6 nd suppress-ra

no ipv6 nd suppress-ra

ð Ô

IPv6 Э a Ѽ Â

ð ٪ Ô

ð Ô

Э ⁸ Ѽ ⅃ Л ipv6 suppress-ra ٪ Â

ð Ô

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

ð ٪ Ô

٪	
show ipv6 interface	ra-info

38.1.19 ipv6 redirects

Э IPV6 ÿ ⅃ Л ٪ ⁸ Э ICMPv6 ˘ ٪ no Э a ICMPv6 Â

ipv6 redirects

no ipv6 redirects

ð Ô

IPV6 Э ICMPv6 Â

ð ¾ Ô

ð Ô

ICMPv6 ⁸ ˘
ɹ Л Ъ 100 ICMPv6 (100pps) Â

ð Ô

```
Ruijie(config)# interface vlan 1
Ruijie(config-if)# ipv6 redirects
```

ð ¾ Ô

¾	
show ipv6 interface	

38.1.20 clear ipv6 neighbors

╟ ˗ Â

clrear ipv6 neighbors

ð ¾ Ô

ð Ô

¾ ɹ Л Ъ RDP ╟ ˗ ˘ a
Â

ð Ô

```
Ruijie# clear ipv6 neighbors
```

ð ¾ Ô

¾	
ipv6 neighbor	
show ipv6 neighbors	

38.1.21 tunnel mode ipv6ip

¾ IPV6 , ¾ no ¾
IPv6 Â

tunnel mode ipv6ip [**6to4** | **isatap**]

no tunnel mode

ð Ô

6to4 ' ѝ 6to4 ╟

isatap ' ѝ ISATAP ╟

ð Ô

IPv6 ѝ Â

ð ʒ Ô

ð Ô

ѝ ˘ ʒ

ð Ô

Â

ð ३ Ô

ð Ô

a ﻵ Э ὲ à ﻵ
Â

~

╟ (6to4 isatap) a Â

ð Ô

IPv6 :

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

interface-type interface-number ' ˘
ў IPv4 й IPv4 Â

ð Ô

Â

ð ৡ Ô

ð Ô

৲ Л IPv4 ≠ ৲ Л Э
IPv4 , ╟ (6to4 isatap) è
Â

~

a ৴ Э è à ৲
Â

╟ ˘ ╟ a ৲ Â

ð Ô

IPv6 '

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

ð ৡ Ô

ৡ	
tunnel mode	
tunnel destination	
tunnel ttl	TTL

38.1.24 tunnel ttl

ৡ IPv6 IPv4 TTL , ৡ no
ৡ 128 Â

tunnel ttl *value*

no tunnel ttl

ð Ô

value' TTL

ð Ô

128 Â

ð ৡ Ô

ð Ô

ৡ ৲ Ո IPv6 IPv4 TTL Â

ð Ô

```
Ruijie(config)# interface tunnel 1
Ruijie(config-if)# tunnel ttl 64
```

ð ৡ Ô

ৡ	
tunnel mode	
tunnel source	
tunnel destination	

38.2

38.2.1 show ipv6 route

IPV6 Â

show ipv6 route [**static**

ֽ ˧ Л Ъ Â

ð Ô

```
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
```

ð Ô

SVI 1 Э

```
Ruijie# show ipv6 neighbors vlan 1
IPv6 Address Linklayer Addr   Interface
fa::1         00d0.0000.0002   vlan 1
fe80::200:ff:fe00:2  00d0.0000.0002  vlan 1
```

```
Ruijie# show ipv6 neighbors verbose
IPv6 Address  Linklayer Addr Interface
2001::1      00d0.f800.0001 vlan 1
       State: Reach/H Age: - asked: 0
fe80::200:ff:fe00:1    00d0.f800.0001 vlan 1
       State: Reach/H Age: - asked: 0
```

	Ⱨ
IPv6 Address	IPV6
Linklayer Addr	Mac ˘ incomplete
Interface	
State	: state/H(R) STATE Ю: INCMP(Incomplete)— ˘ (NS) (NA). REACH(Reachable) — ÿ ˘ a ╟ STALE— й ┘ ˘ a ╟ Э˘ ╟ NUD(Neighbor Unreachability Detection) Â DELAY— STALE ˘ STALE й DELAY ˘ DELAY_FIRST_PROBE_TIME seconds(5) ┘ ˘ ⱨ DELAY й PROBE˘ ┘ (NS)˘ ╟ NUD. PROBE— NUD ╟˘ ┘ ˘ RetransTimer milliseconds (NS) Э

ʒ Â ѝ ѝ ў ѝ ˩ ˘

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

Э ⅃Л INET6: 2001::1 , subnet is 2001::/64 [TENTATIVE]

```
ND advertised reachable time is 0 milliseconds
ND advertised retransmit time is 0 milliseconds
ND advertised CurHopLimit is 64
Prefixes: (total: 1)
fec0:1:1:1::/64(Def,Auto,vltime:  2592000,  pltime:
604800, flags: LA)
```

ra-info Ⱨ

	Ⱨ
RA timer is stopped (on)	Ὼ
waits	ὴ ὲ
initcount	RA ╟ Ὼ
RA(out/in/inconsistent)	out: Ὼ in: Ὼ inconsistent: Ὼ Ὼ a
RS(input)	
Link-layer address	
Physical MTU	MTU
!M | M	!M Ὼ managed-config-flag Æ Э M: б Э ↓
!O | O	!O Ὼ other-config-flag Æ Э O: б Э ↓

ra-info (Prefix) '

	Ⱨ
total	
fec0:1:1:1::/64	ἑ

Def	
Auto | CFG	Auto IPV6 ╟ , CFG
!Adv	a Ὼ
vltime	( )
pltime	( )
L | !L	L on-link Æ Э !L б Э ৲
A | !A	A auto-config Æ Э, !A б Э ৲

39 OSPFv3

39.1

39.1.1 area default-cost

stub ʍ ABR Ɔ ʒˇ ⊮ stub ʍ NSSA ʍ
ʒˈ Â ʒ **no** Â

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

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

ð Ô

area-id	stub ʍ ʍ /ˡ Â

39.1.2 area range

ʒ Ш ˘ ʒ **no**
Â

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

ð Ô

area-id	Ш Л Â è Л Ո й IPv4 Â
ipv6-prefix/*prefix-length*	Â

not-advertise a Ώ ⊿

ֽ stub ʁ Stub ʁ ˘ ֽ
no ́ ʁ Stub ʁ Â

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

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

ð Ô

area-id	stub ʁ NSSA ʁ ʁ /ʃ Â è ˩ Л ́ IPv6 Â
no-summary	˩ stub ʁ ABR Э ˘ ABR ˩ 3 LSA Ὼ stub ʁ ˘ a Ὰ Ὼ 3 è LSA Â

ð Ô

ⱷ Stub ʁ Â

ð ֽ Ô

OSPFv3 Â

ð Ô

no area *area-id* **stub** ʁ ́ ʁ Â

no area *area-id* ʁ (ʁ) Â

stub ʁ ABR Э 3 LSA
Ὼ stub ʁ ˘ NSSA ʁ ABR Э ˩ **no-su**
mmary /ʃ 3 LSA Ὼ NSSA ʁ
Â

ð Ô

Ю ˘ Stub ʁ 10 ABR Э ˩ Ὼ Stub ʁ '

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

ð ֽ Ô

ֽ	
area default-cost	Stub ʁ ֽ Â
show ipv6 ospf area	OSPFv3 ʁ Â

39.1.4 area virtual-link

٦ ˘ ٦

no ┘Л Â

¸ ш a stub ш NSSA ш Â

¸ ч Э ˘ **hello-interval** ä **dead-interval** **instance** ˘ Â

¸ **no area** *area-id*ˇ ш (ш)Â

ð Ô

Ю ˘ '

```
ipv6 router ospf 1
area 1 virtual-link 192.1.1.1
```

ð ٪ Ô

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

39.1.5 auto-cost

OSPF ˘ ٪ ╟ ˘ ٪ **no** Â

auto-cost [**reference-bandwidth** *ref-bw*]

no auto-cost [**reference-bandwidth**]

ð Ô

reference-bandwidth *ref-bw*	˘ Л Mbps и Æ Â 1-4294967ˇ и 100Mbps Â

ð Ô

˘ и 100Mbps Â

ð ٪ Ô

OSPFv3 Â

ð Ô

no auto-cost reference-bandwidth Â

ЛЛЬ Ю ч **ipv6 ospf cost** и
ЧЁ ў Ё ¶І Â

ð Ô

Ю ў и 10М

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

ð ч Ô

ч	
ipv6 ospf cost	ЧЁ Â
show ipv6 ospf	OSPFv3 Â

39.1.6 clear ipv6 ospf process

ч OSPF Â

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

ð Ô

process-id	ospf Л <1-65535>

ð ч Ô

Â

ð Ô

Ю ч Â

ð Ô

Ю ў ╟ ospf

```
en
clear ipv6 ospf process
```

39.1.7 default-information originate

OSPF ў ч
default-information originate Â ч **no** Â

default-information originate [**always**] [**metric** *metric*] [**metric-type** *type*] [**route-map** *map-name*]

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

ð Ô

always	ˆ ˩ ˜ OSPF ˚ ˘ a Â
metric *metric*	ˆ ˩ ˜ ˘ ѝ 1 Â
	ˆ ˩ ˜ Â OSPF

metric-type *type*

ð Ô

Ю ˘ ƚ '

```
default-information originate always
```

ð ч Ô

ч	
redistribute	ƚ Â
show ipv6 ospf	OSPFv3 Â
show ipv6 ospf database	OSPFv3 Â

39.1.8 default-metric

ч ƚ ˘ ч **no**
Â

default-metric *metric-value*

no default-metric

ð Ô

metric-value	ƚ Â 1-16777214 ѝ 20 Â

ð Ô

20

ð ч Ô

OSPFv3 Â

ð Ô

ч ˩ **redistribute** ч ˘ ƚ
Â ч ч '

1. **default-information originate** ч ’
2. ƚ ˘ ƚ 20 ѝ Â

ð Ô

Ю ˘ ƚ metric ѝ 10

```
default-metric 10
```

ð ч Ô

ч	
redistribute	↑ Â
show ipv6 ospf	OSPFv3 Â

39.1.9 ipv6 ospf area

ч б OSPFv3 ˘ ч **no** ╗ Â

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

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

ð Ô

process-id	ospf Л
area *area-id*	б OSPFv3 ш Â è ┘Ц й IPv6 Â
instance *instance-id*	OSPFv3

ð Ô

╗ Â

ð ч Ô

Â

ð Ô

ч б OSPFv3 ˘ **ipv6 router ospf** ╠ OSPFv3 ˘ ╠ ╠ OSPFv3 Â

no ipv6 ospf area ч a ̈Ą б OSPFv3 Â

no ipv6 router ospf ч a ̈Ą б OSPFv3 Â

┘ *instance-id* ┘ Â

ч Л˘ Э б OSPFv3 Â

ð Ô

Ю ˘ int fastethernet 0/0 Э ╠ OSPFv3 ˘ б ш '

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

39.1.11 ipv6 ospf dead-interval

ʒ Э ѝ ˘
hello ѝ ˘ ʒ **no** Â

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

ð Ô

seconds	Â 1-65535( ) Â
instance *instance-id*	OSPFv3

ð Ô

ip ospf hello-interval 4 Â

ð ʒ Ô

Â

ð Ô

˩˘ Â

ѝ hello 4 ˘ hello
˘ ╟ Â

a ˘ ˘ '

1. hello Â
2. ˩ Â

ð Ô

Ю ˘ ѝ ѝ 60s'

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

ð ʒ Ô

ʒ	
ipv6 ospf hello-interval	Э Hello Â
show ipv6 ospf interface	OSPFv3 Â
instance *instance-id*	OSPFv3

39.1.12 ipv6 ospf hello-interval

ð Ô

Â

ð ʒ Ô

ð Ô

ɻ Л Ъ ˘ Â

ð Ô

Ю ˘ б OSPFv3 ѝ '

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

ð ʒ Ô

ʒ	
ipv6 ospf priority	″I Â
show ipv6 ospf interface	OSPFv3 Â
instance *instance-id*	OSPFv3

39.1.15 ipv6 ospf priority

ʒ ″I ˘ ʒ **no** Â

ipv6 ospf priority

˘ DR/BDR(/) Â
DR/BDR ˘ ˝I ˝I ѝ DR BDR˝
˝I ⊿˘ Router-ID ˘ ˝I ѝ DR BDR Â

˝I ѝ˚ ˘ a б DR/BDR Â

DR BDR˝ ѫ ˝I a ˘
⊿ Ю DR BDR ˘ б Â

ð Ô

Ю ˘ DR/BDR ˘ a ˝Ą ѝ DR BDR'

```
ipv6 ospf priority 0
```

ð ʒ Ô

ʒ	
ipv6 ospf network	Â
router-id	Â
show ipv6 ospf interface	OSPFv3 Â
instance *instance-id*	OSPFv3

39.1.16 ipv6 ospf retransmit-interval

ʒ Э LSA ˘ ʒ **no**
Â

ipv6 ospf retransmit-interval *seconds* [**instance** *instance-id*]

no ipv6 ospf retransmit-interval [**instance** *instance-id*]

ѝ ˩ ˘ LSA ˘
Â ˩Л˅ ˘ ʒ
˘ ˘ LSA Â

ð Ô

Ю ˘ LSA ѝ 10s'

```
ipv6 ospf retransmit-interval 10
```

ð ʒ Ô

ʒ	
show ipv6 ospf interface	OSPFv3 Â
instance *instance-id*	OSPFv3

39.1.17 ipv6 ospf transmit-delay

ʒ Э LSA ˘ ʒ **no**
Â

ipv6 ospf transmit-delay *seconds* [**instance** *instance-id*]
no ipv6 ospf transmit-delay [**instance** *instance-id*]

ð Ô

seconds	LSA Â 1-65535( ) Â
instance *instance-id*	OSPFv3 0-255.

ð Ô

1

ð ʒ Ô

Â

ð Ô

ʒ Э LSA Â

ð Ô

Ю ˘ Э LSA '

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

ð ३ Ô

३	
show ipv6 ospf interface	OSPFv3 Â

39.1.18 ipv6 router ospf

३ OSPFv3 ˘ ३ **no** OSPFv3 Â

ipv6 router ospf *process-id*

no ipv6 router ospf *process-id*

ð Ô

process-id	OSPF ʌ

ð Ô

OSPFv3 Â

ð ३ Ô

Â

ð Ô

OSPFv3 ʌ˘ OSPFv3 Â

ð Ô

Ю ˘ ╟ OSPFv3 '

```
ipv6 router ospf 1
```

ð ३ Ô

३	
ipv6 ospf area	б OSPFv3 Â
show ipv6 ospf	OSPFv3 Â

39.1.19 log-adj-changes

३ ˩ ˘ ३ no default ˩ Л℧ ╖ Â

log-adj-changes [**detai**l]

no log-adj-changes [**detail**]

ð Ô

detail	↓

ð Ô

FULL ’

ð ¾ Ô

Â

ð Ô

ЛЪЮ ˘ ↓ Â

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

ð ¾Ô

¾	
show ipv6 ospf	ospf Â

39.1.20 max-concurrent-dd

↓ DD Â

max-concurrent-dd *number*

no max-concurrent-dd

ð Ô

number	, 1-65535.

ð Ô

8

ð ¾ Ô

OSPFv3 Â

ð Ô

Ю max-concurrent-dd й 4 ˇ ˬ ˬ б 4
DD '

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

39.1.21 passive-interface

ʒ ˘ ʒ **no** ˬ Â

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

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

ð Ô

default	й Â
interface-type interface-number	й Â

ð Ô

Â

ð ʒ Ô

OSPFv3 Â

ð Ô

й ˘ a Ą hello Â

ʒ ˬ б OSPF ˘ з a Â

ð Ô

Ю ˘ ˬ VLAN1 б OSPFv3 '

```
passive-interface default
no passive-interface vlan 1
```

ð ʒ Ô

ʒ	
ipv6 ospf area	б OSPFv3 Â
show ipv6 ospf	OSPFv3 Â
show ipv6 ospf neighbor	OSPFv3 Â

39.1.22 redistribute

ৡ ╟ ↑ ˘ è
OSPFv3 Â ৡ **no** ↓ ╖ ↑
Â

redistribute *protocol* [**metric** *metric-value*] [**metric-type** *type-value*][**route-map** *map-tag*] [**match** [**internal** | [**external** | **nssa-external**

ƫ OSPF Ʌ *match* ˘ ƫ OSPF
˘ ˘ ѝ ƫ OSPF Â

ƫ route-map *match*
ɔ ' ƫ tagˇ *metric* б *metric-type* ″I æ
route-map *set* ″I '

ð Ô

Ю ˘ ƫ ˘ route-map tesſ ѝ match metric 20 б set metric 30˜ '

```
redistribute connect metric  10 route-map test
```

ƫ metric ѝ 20 ˘ ε metric ѝ 30ʹ

ð ȝ Ô

ȝ	
default-information originate	ƫ Â
default-metric	ƫ Â
summary-prefix	Â
show ipv6 ospf	OSPFv3 Â
show ipv6 ospf database	OSPFv3 Â

39.1.23 router-id

ȝ (Router ID)ˇ ȝ **no**
Router IDˇ Router ID Â

router-id *router-id*

no router-id

ð Ô

router-id	Â IPv4 Â

ð Ô

╟ ѝ Â

ð ȝ Ô

OSPFv3 Â

ð Ô

ʃ OSPFv3

ð Ô

spf-delay' 5

spf-holdtime' 10

ð ¾ Ô

OSPFv3 Â

ð Ô

spf-delay *spf-holdtime* ˘ OSPF Ù
≠ ˘ ≠ ˘ ´ Â

ð Ô

```
timers spf 2 4
```

ð ¾ Ô

¾	
clear ipv6 ospf	¾ ╟ OSPFv3 ¦ ╖ Â
show ipv6 ospf	OSPFv3 Â

39.2

39.2.1 show ipv6 ospf

OSPFv3 Â

show ipv6 ospf [*process-id*]

ð Ô

process- id	ospf Ñ, 1-65535.

ð ¾ Ô

Â

ð Ô

ÞO OSPFv3

```
Ruijie# show ipv6 ospf
Routing Process "OSPFv3 (1)" with ID 1.1.1.1
Process uptime is 24 minutes
SPF schedule delay 5 secs, Hold time between SPFs 10 secs
```

```
Minimum LSA interval 5 secs, Minimum LSA arrival 1 secs
Number of incomming current DD exchange neighbors 0/5
Number of outgoing current DD exchange neighbors 0/5
Number of external LSA 0. Checksum Sum 0x0000
Number of AS-Scoped Unknown LSA 0
Number of LSA originated 11
Number of LSA received 4
Log Neighbor Adjency Changes : Enabled
Number of areas in this router is 2
Area BACKBONE(0)
Number of interfaces in this area is 1(1)
SPF algorithm executed 4 times
Number of LSA 3.  Checksum Sum 0x1DDF1
Number of Unknown LSA 0
```

OSPFv3 б BFD ╟, Э ╕ "BFD is enabled", Ю

```
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 incomming current DD exchange neighbors 0/5
Number of outgoing current DD exchange neighbors 0/5
Number of external LSA 0. Checksum Sum 0x0000
Number of AS-Scoped Unknown LSA 0
Number of LSA originated 11
Number of LSA received 4
Log Neighbor Adjency Changes : Enabled
Number of areas in this router is 2
BFD is enabled
Area BACKBONE(0)
Number of interfaces in this area is 1(1)
SPF algorithm executed 4 times
Number of LSA 3.  Checksum Sum 0
```

ð ¾Ô

¾	
ipv6 router ospf	╟ OSPFv3 Â
default-information originate	¦ Â

default-metric	↾ Â
router-id	OSPFv3 Â
timers spf	OSPFv3 ↓ ˘ SPF ˘ Л∪ ч SPF Â

39.2.2 show ipv6 ospf database

OSPFv3 Â

show ipv6 ospf [

```
Router-LSA (Area 0.0.0.0)
Link State ID   ADV Router      Age  Seq#       CkSum
Link
0.0.0.0        1.1.1.1      17 0x80000006 0x62a1     1
0.0.0.0         2.2.2.2          156 0x80000003 0x8653
1
Network-LSA (Area 0.0.0.0)
Link State ID   ADV Router     Age  Seq#      CkSum
0.0.0.5        2.2.2.2        157 0x80000001 0xf8f6
Router-LSA (Area 0.0.0.1)
Link State ID   ADV Router      Age  Seq#       CkSum
Link
0.0.0.0         1.1.1.1           17 0x80000002 0x0529
0
Inter-Area-Prefix-LSA (Area 0.0.0.1)

Link State ID   ADV Router     Age  Seq#      CkSum
0.0.0.1        1.1.1.1         77 0x80000002 0x83b4

                    AS-external-LSA

Link State ID   ADV Router     Age  Seq#      CkSum
0.0.0.1        1.1.1.1         1 0x80000001 0x6035 E2
```

ð ¾ Ô

¾	
ipv6 router ospf	╠ OSPFv3 Â

39.2.3 show ipv6 ospf interface

OSPFv3 Â

show ipv6 ospf interface [*interface-type interface-number*]

ð Ô

interface-type	

```
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 ╠, ⌘ ৡ ╕ ' **BFD enabled** ┗

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

ð ৡ Ô

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```
Database Summary List 0
Link State Request List 0
Link State Retransmission List 0
          BFD    6            ,  ¤            ¶  Ю
Ґ BFD session state up Ц
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
```

ð ¾Ô

¾	
ipv6 router ospf	╠ OSPFv3 Â
ipv6 ospf area	6 OSPFv3 Â
area virtual-link	OSPFv3 Â
show ipv6 ospf interface	OSPFv3 Â

39.2.5 show ipv6 ospf route

OSPFv3 Â

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

ð Ô

process- id	OSPFv3 Л, 1-65535.
count	OSPFv3

ð ¾ Ô

Â

ð Ô

Ю ¾ OSPF

```
Ruijie# show ipv6 ospf route
OSPFv3 Process (1)
Codes: C - connected, D - Discard, O - OSPF, IA - OSPF
inter area, E1 - OSPF external type 1, E2 - OSPF external
type 2
Destination                                Metric
Next-hop
E2 2222::/64                                  1/20
via fe80::c800:eff:fe84:1c, FastEthernet 1/0
O  3333::/64                                   11
via  fe80::c800:eff:fe84:1c,  FastEthernet  1/0,  Area
0.0.0.0
```

ð ¾ Ô

¾	
ipv6 router ospf	╟ OSPFv3 Â

39.2.6 show ipv6 ospf topology

OSPFv3 ѡ Â

show ipv6 ospf [*process- id*] **topology** [**area** *area-id*]

ð Ô

process- id	OSPFv3 Л , 1-65535.
area-id	ѡ

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ð Ô

Ю ¾ OSPFv3 ѡ

```
Ruijie# show ipv6 ospf topology
OSPFv3 Process (1)
OSPFv3 paths to Area (0.0.0.0) routers
Router ID       Bits  Metric    Next-Hop
Interface
1.1.1.1          EB  --
```

```
2.2.2.2          E   1        2.2.2.2
FastEthernet 1/0

OSPFv3 paths to Area (0.0.0.1) routers
Router ID       Bits  Metric    Next-Hop
Interface
1.1.1.1          B   --
```

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¾	
ipv6 router ospf	╟ OSPFv3 Â
area range	OSPF Ψ

39.2.7 show ipv6 ospf virtual-links

OSPFv3 Â

show ipv6 ospf [*process- id*] **virtual-links**

ð Ô

process- id	OSPFv3 Л, 1-65535.

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ð Ô

ЮО ¾ ┘ OSPFv3

```
Ruijie# show ipv6 ospf virtual-links
Virtual Link VLINK1 to router 2.2.2.2 is down
Transit area 0.0.0.1 via interface FastEthernet 1/0,
instance ID 0
Local address *
Remote address 3333::1/128
Transmit Delay is 1 sec, State Down,
Timer intervals configured, Hello 10, Dead 40, Wait 40,
Retransmit 5
Hello due in inactive
Adjacency state Down
```

ð ¾Ô

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40 IGMP

40.1 IGMP

IO ?

- **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**

clear ip igmp group[*group-address* | *interface-type interface-number*]

ð Ô

group-address

40.1.4 ip igmp join-group

ৡ ╗ ˘ ৡ ╗ no ৸ Â

ð ৡ Ô

ip igmp join-group *group-address*

no ip igmp join-group *group-address*

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group-address	Э ╖

ð Ô

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¢ ╖ ˘ ╖
Â

ð Ô

ЮО ˘ Eth0 ╖ 236.6.6.6 Â

```
Ruijie# configure terminal
Ruijie(config)# interface ethernet 0
Ruijie(config-if)# ip igmp static-group 236.6.6.6
Ruijie(config-if)# exit
```

40.1.6 ip igmp immediate-leave group-list

IGMPversion2 IGMPversion3 ˘ ¢ЛЦ
Â ¢ √ ў ЮÂ
¢ no √ ╖ Â

ð ¢ Ô

ip igmp immediate-leave group-list *access-list*

no ip igmp immediate-leave group-list

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access-list	⁸ ⅄

ð Ô

ð ¢ Ô

ð Ô

ʒ Ю˘ ʌ˘
Â ў ʌ˘ Â ↓
ᾱ ʌ IGMP ↓ ˘ Ю 2s Â

ʒ˘ ʌ˘ a Â
↓˘ IGMP ᾰ ѝ ˘ IGMP
Â ↓ Л Â

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Ю ѝ ╖ ˘
↓ Â

```
Ruijie# configure terminal
Ruijie(config)# access-list 1 permit 225.192.20.0
0.0.0.255
Ruijie(config)# interface ethernet 0/1
Ruijie(config-if)# ip igmp immediate-leave group-list
1
Ruijie(config-if)# exit
```

ð ʒ Ô

ip igmp last-member-query-interval

40.1.7 ip igmp last-member-query-count

last-member-query-count leave ʌ˘
Â ʒ **last-member-query-count** Â
no ʒ Â

ð ʒ Ô

ip igmp last-member-query-count *number*

no ip igmp last-member-query-count

ð Ô

number	ʌ , ѝ <2-7>

ð Ô

last member query count ѝ 2 Â

ð ʒ Ô

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ð Ô

I 3 .

ip igmp immediate-leave

40.1.9 ip igmp limit ( )

ʒ igmp states Â ˬ ˘ no
Â

ð ʒ Ô

ip igmp limit *number* **except** *access-list*]

no ip igmp limit

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number	IGMP ˘ é ˘ 1-16384 Â
except	ˆ ˩ ˜ access-list a б ˘ a ˬ limit ⁸
access-list	ˆ ˩ ˜ ˩

ʒ ˘ ˩ Л ∪ no

ѝ

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ip igmp query-interval *seconds*

no ip igmp query-interval

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seconds	Â Æ sˇ 1˙ 18000

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125 Â

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˩ ՈՄ ˇ ˩ Â

ð Ô

Ethernet 0 ˇ ѝ 120s Â

```
Ruijie(config-if)# ip igmp query-interval 120
```

Ethernet 0 ˇ ѝ Â

```
Ruijie(config-if)# no ip igmp query-interval
```

40.1.11 ip igmp query-max-response-time

ֽ ˇ ˩ ՈՄ no ѝ Â

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ip igmp query-max-response-time *seconds*

no ip igmp query-max-response-time

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seconds	ˇ Æ sˇ 1˙ 25

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10s Â

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ʒ ˧ IGMPv2 Â ʒ ⁸
Â

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Ethernet 0 ˘ ѝ 20s Â

```
Ruijie(config-if)# ip igmp query-max-response-time 20
```

Ethernet 0 ˘ ѝ Â

```
Ruijie(config-if)# no ip igmp query-max-response-time
```

40.1.12 ip igmp query-timeout

ʒ è ˘ ˧Л no è
ѝ Â

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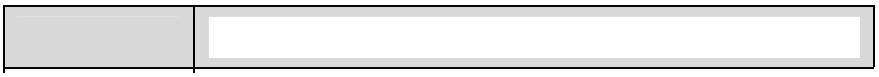
ip igmp query-timeout *seconds*

no ip igmp query-timeout

ð Ô



seconds è ˘ Æ ѝ s˘ 60˙
300

Ethernet 0 ˘ è ỳ Â

```
Ruijie(config-if)# no ip igmp query-timeout
```

40.1.13 ip igmp robustness-variable

ʒ ˩ Л℧ ˩ ˩ ˘ ˘
ʒ ╗ no Â

ð ʒ Ô

ip igmp robustness-variable *number*

no ip igmp robustness-variable

ð Ô

number	˩ ˘ ỳ è 2-7 Ê

ð Ô

ỳ 2˙

ð ʒ Ô

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ð Ô

ЛЮ ˩ ỳ 3˙

```
Ruijie# configure terminal
Ruijie(config)# interface ethernet 0
Ruijie(config-if)# ip igmp robustness-variable 3
```

40.1.14 ip igmp version

ʒ IGMP Л Â ˘
no Â

ð ʒ Ô

ip igmp version {**1** | **2** | **3**}

no ip igmp version

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{**1** | **2** | **3**}	Ь ٨˘ ٸ <1-3>

ð Ô

Ю ٨ ٸ 2.

ð ٹ Ô

ð Ô

igmp ٨˘ ٨˘ igmp ╟ Â

ð Ô

ЛЪЮ ٨ ٸ 2ٛ

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

40.1.15 ip igmp limit ( )

ٹ ٦Л igmp Â ٧ ˘ no Â

ð ٹ Ô

ip igmp limit *number* [**except** *access-list*]

no ip igmp limit *number* [**except** *access-list*]

ʒ IGMP ⁸˘
⁸ ʃ a IGMP ˘ a Â

ʒ ⅃Л˘ ˘ ⅃Л˘ ˘
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ЛЮ ⁸ ѝ 300

```
Ruijie˜ config˜ # ip igmp limit 300
```

40.1.16 ip igmp proxy-service

ʒ ╟ Ю mroute-proxy ┺╖ Â Э
ʒ˘ ѝ mroute-proxy Э ˘ Ю
˘ Ю Э Â

ip igmp proxy-service

no ip igmp proxy-service

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a ѝ proxy-service

ð ʒ Ô

ð Ô

ʒ ⅃ ⁸˘ ⅃ 32 Â
proxy-service Ю ⅃Л˘ 255 Ю Â
Л˘ proxy-service ˘ Â
proxy-service ÿ mroute-proxy
Â ˘ proxy-service˘ ⅃
ў ѝ˘ a ѝ.

switchport ˘ Ю **ip igmp**
mroute-proxy interface ʒ ╟ Â

ð Ô

ѝ proxy-service

```
Ruijie(config-if)# ip igmp proxy-service
```

40.1.17 ip igmp mroute-proxy

ʒ ˘ ⅃Л˘ è Э Â

ip igmp mroute-proxy *interfname*

no ip igmp mroute-proxy

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interfname	Э ⅄

ð Ô

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ð Ô

Э ѝ proxy-service ⅄˘ ⅃Ⱡ è
gmp Â

ð Ô

mroute-proxy

```
Ruijie(config-if)# ip igmp mroute-proxy fa 0/1
```

40.1.18 ip igmp ssm-map enable

ৡ Ю ╟ **igmp ssm-map** ╖ ˘ ৡ ѝ'

ip igmp ssm-map enable

no ip igmp ssm-map enable

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╖ a ╟ Â

ð ৡ Ô

ð Ô

ৡ ˘ ╟ ⁸ ╕
Â ৡ ৡ **ip igmp ssm-map static** Â

ð Ô

igmp ssm-map ╖ Â

```
Ruijie(config)# ip igmp ssm-map enable
```

40.1.19 ip igmp ssm-map static

҄ Ю ssm-map ˘ ҄ й'

ip igmp ssm-map static *access-list a.b.c.d*

no ip igmp ssm-map static *access-list a.b.c.d*

ð Ô

access-list	Acl ы й <1-99> |<1300-1999> |WORD
a.b.c.d	

ð Ô

ð ҄ Ô

ð Ô

҄ б **ip igmp ssm-map enable** ˘ ҄ л˘ v3 ЛЬЮ Э Â

ð Ô

ACL й 11 Э 192.168.2.2, ҄ й'

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

40.1.20 show ip igmp groups

҄ б ÿ IGMP ˙ Â

ð ҄ Ô

show ip igmp groups [*group-address* | *interface-type*

interface-number] [*detail*]

ð Ô

group-address	32 Æ IP D ˘ 8 Æ ˘ Л 8 ˘
interface-type	

interface-number	/ৗ
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
```

Ю '

```
Ruijie# show ip igmp groups 224.1.1.1 detail
Interface: eth1
Group: 224.1.1.1
Uptime: 00:00:42
Group mode: Include
Last reporter: 192.168.50.111
TIB-A Count: 2
TIB-B Count: 0
Group source list: (R - Remote, M - SSM Mapping)
Source Address Uptime v3 Exp Fwd Flags
192.168.55.55 00:00:42 00:03:38 Yes R
192.168.55.66 00:00:42 00:03:38 Yes R
```

40.1.21 show ip igmp interface

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

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interface-type	
interface-number	/ৗ

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```
Ruijie# show ip igmp interface
Interface vlan 1(Index 4294967295)
IGMP Active, Non-Querier, Version 3 (default)
IGMP querying router is 0.0.0.0
IGMP query interval is 125 seconds
IGMP querier timeout is 255 seconds
IGMP max query response time is 10 seconds
Last member query response interval is 1000 milliseconds
Group Membership interval is 260 seconds
IGMP Snooping is globally enabled
IGMP Snooping is enabled on this interface
IGMP Snooping fast-leave is not enabled
IGMP Snooping querier is not enabled
IGMP Snooping report suppression is enabled
```

40.1.22 show ip igmp ssm-mapping

ঽ IGMP ssm-map ˘ ঽ Ю'

show ip igmp ssm-mapping [*A.B.C.D*]

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A.B.C.D	

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IGMP ssm-map Â

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ssm-map

```
Ruijie# sh ip igmp ssm-mapping
SSM Mapping : Enabled
Database    : Static mappings configured
```

233.3.3.3

```
Ruijie#show ip igmp ssm-mapping 233.3.3.3
Group address: 233.3.3.3
Database    : Static
Source list  : 192.3.3.3
             : 3.3.3.3
```

41 PIM-DM

41.1 PIM-DM

PIM-DM ЛъЮ ¾'

- **ip pim dense-mode**
- **ip pim neighbor-filter**
- **ip pim query-interval**
- **ip pim state-refresh disable**
- **ip pim state-refresh origination-interval**
- **show ip pim dense-mode interface**
- **show ip pim dense-mode neighbor**
- **show ip pim dense-mode nexthop**
- **show ip pim dense-mode mroute**

41.1.1 ip pim dense-mode

Э PIM-DMЃ **ip pim dense-mode** ¾ Â
¾ no Э PIM-DM Â

ip pim dense-mode

no ip pim dense-mode

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PIM-DM Â

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```
Ruijie# configure terminal
Ruijie(config)# interface fastethernet 0/1
Ruijie(config-if)# ip pim dense-mode
```

&

```
Ruijie# configure terminal
Ruijie(config)# interface fastethernet 0/1
Ruijie(config-if)# ip pim neighbor-filter 14
```

&

ip pim neighbor-filter ҃ '

1. ৸ ACL ˚ ѝ PIM ˇ ACL ѝ PIM Â
2. ˆ peering˜ ˇ PIM Â б PIM ˇ a б ˇ ≠ a PIM Â

41.1.3 ip pim query-interval

hello interval ˇ ѧ Ń Ë

41.1.4 ip pim state-refresh disable

Э PIM-DM ⁹ ˘ **ip pim state-refresh disable** ʒ Â ʒ no PIM-DM ⁹ ℸ Â

ip pim state-refresh disable

no ip pim state-refresh disable

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⁹ ℸ ˘ a ⁹ ' Hello a ⁹ ˘ Hello a SR Cap Â

ð Ô

ЛЪЮ PIM-DM ⁹ Â

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

~

ip pim state-refresh disable ʒ '

⁹ ℸ ˩ PIM-DM ˘ a ˘ Л Ъ Ю a ⁹ ℸ Â

41.1.5 ip pim state-refresh origination-interval

PIM-DM ⁹ ˘ **ip pim state-refresh origination-interval** ʒ Â ч ⁹ Â ʒ no ˩ Л Ъ й Â

ip pim state-refresh origination-interval *interval-seconds*

no ip pim state-refresh origination-interval

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interval-seconds	↓ <1-100>˘ Æ ù Â

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60 Â

ð ˛ Ô

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```
Ruijie# configure terminal
Ruijie(config)# interface fastethernet 0/1
Ruijie(config-if)# ip pim state-refresh
origination-interval 65
```

41.1.6 show ip pim dense-mode interface

PIM-DM ˘ **show ip pim dense-mode interface** ˛ Â

show ip pim dense-mode interface [*interface-type interface-number*] [*detail*]

ð Ô

interface-type interface-number	/↓
detail	

ð ˛ Ô

/ /

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ЛЬЮ ù **show ip pim dense-mode interface** ˛ '

```
Ruijie# show ip pim dense-mode interface
Address       Interface        VIFIndex  Ver/   Nbr
                                         Mode   Count
10.10.10.10   FastEthernet 0/45   3      v2/D    1
```

```
50.50.50.50   VLAN 4                2      v2/D    1
```

Ю'

Address	PIM-DM ў IP
Interface	PIM-DM ⁄
VIF Index	VIF ^ ID~
Ver/Mode	PIM /
Nbr Count	PIM-DM

Neighbor-Address	
Interface	б
Uptime/Expires	Лъ
Ver	PIM

41.1.8 show ip pim dense-mode nexthop

PIM-DM Ю ˘ **show ip pim dense-mode nexthop** ʒ Â

show ip pim dense-mode nexthop

ð Ô

ð ʒ Ô

/ /

ð Ô

ЛъЮ ʒ PIM-DM Ю '

```
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
```

Ю'

Destination	
Nexthop Num	Ю
Nexthop Addr	Ю

Nexthop Interface б Ю p4 Tc 10.5 0 0 10.5 180.6 268.8803

PIM-DM ˘ **show ip pim dense-mode mroute**
¾ Â

show ip pim dense-mode mroute [*A.B.C.D A.B.C.D*] [*summary*]

ð Ô

42 PIM-SM

42.1 PIM-SM

PIM-SM ЛЬЮ ҙ'

- **clear ip mroute**
- **clear ip mroute statistics**
- **clear ip pim sparse-mode bsr rp-set**
- **ip multicast-routing**
- **ip pim accept-register list**
- **ip pim bsr-candidate**
- **ip pim cisco-register-checksum**
- **ip pim dr-priority**
- **ip pim ignore-rp-set-priority**
- **ip pim jp-timer**
- **ip pim mib**
- **ip pim neighbor-filter**
- **ip pim query-interval**
- **ip pim register-rate-limit**
- **ip pim register-rp-reachability**
- **ip pim register-source**
- **ip pim register-suppression**
- **ip pim rp-address**
- **ip pim rp-candidate**
- **ip pim rp-1 Tf-0.E0t**
- **ip pim sparse-mode**
- **ip pim spt-threshold**
- **ip pim ssm**
- **show debugging**
- **show ip pim sparse-mode bsr-router**

- **show ip pim sparse-mode interface**
- **show ip pim sparse-mode local-members**
- **show ip pim sparse-mode mroute**
- **show ip pim sparse-mode neighbor**
- **show ip pim sparse-mode nexthop**
- **show ip pim sparse-mode rp mapping**
- **show ip pim sparse-mode rp-hash**

42.1.1 clear ip mroute

ð ¾ Ô

clear ip mroute {* | *group_address* [*source_address*] }

ð Ô

*	Â
group_address	Â
group_address *source_address*	Â

ð ¾ Ô

ð Ô

╟

ð Ô

```
Ruijie# clear ip mroute *
Ruijie# clear ip mroute 224.2.2.2
Ruijie# clear ip mroute 224.2.2.2 2.2.2.2
```

42.1.2 clear ip mroute statistics

ð ¾ Ô

clear ip mroute statistics {* | *group_address* [*source_address*] }

ð Ô

*	Â

group_address	Â
group_address *source_address*	Â

ð ¾ Ô

ð Ô

╟

ð Ô

```
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
```

ð Ô

╠ ˘ ¦Â Э ╠ PIM-SM ˘ ≠
¦˘ ˘ **ip pim sparse-mode** ¦˘ PIM-SM
╠ Â

ð Ô

```
Ruijie(config)# ip multicast-routing
```

42.1.5 ip pim accept-register list

ð ¦ Ô

ip pim accept-register list *access-list*

ð Ô

access-list	access-list˙ <100˝ 199> å <2000˝ 2699>˘ ˩ acl

ð Ô

˘ a ¦˘ RP Э ¨Ą a [8].

ð ¦ Ô

ð Ô

RP Э [8] ¨Ą ˘ ¦Â

ð Ô

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

ð ¦Ô

access-list

42.1.6 ip pim bsr-candidate

ð ¦ Ô

ip pim bsr-candidate *interface-type interface-number*
[*hash-mask-length*][*priority-value*]

ð Ô

interface-type interface-number	
hash-mask-length	˩ ˘ ˩ ̀ <0-32>˘ ̀ RP ⁸ HASH ˘ 10
priority-value	˩ ˘ ˩ ̀ <0-255>˘ BSR ˝I ˘ 64

ð Ô

˘ a ֽ˘ a BSR

ð ֽ Ô

ð Ô

PIM-SM ˘ BSR Â BSR
RP Â BSR Ὼ
BSR Â BSR ˘ C-BSR ̀ BSR˘
PIM-SM Л 224.0.0.13 ˘ BSR
˝I Â

ֽ ˩ Л ǂ BSR
PIM ˘ ˝I BSR ˩ ˘
˘ ̀ BSR
˘ ' Â

BSR ̀ BSR˘ ÿ ˥ BSR
˘ ˥ BSR ˝I ˆ
˝I ˘ IP ˜ Â

ð Ô

```
Ruijie# configure terminal
Ruijie(config)# ip pim bsr-candidate g 0/3
Ruijie(config)# ip pim bsr-candidate g 0/3 30 192
```

42.1.7 ip pim cisco-register-checksum

ð ֽ Ô

ip pim cisco-register-checksum [**group-list** *access-list*]

ð Ô

access-list	access-list˝ ˛ acl Â group-list access-list Â	<1˘ 99> å <1300˝ 1999>˘ ˘

ð Ô

DR ˘ Ю '

¸ ˩ Hello ″I ˘ ѫ
DR ˘ ″I ″I ˘ ″I ˘ и DR’
˩ ″I ˘ ѫ˘ IP ˘ DR Â

¸ ˩ Hello ″I
˘ ѫ DR ˘ IP ˘ DR Â

ð Ô

```
Ruijie# configure terminal
Ruijie(config)# interface g 0/3
Ruijie(config-if)# ip pim dr-priority 10000
```

42.1.9 ip pim ignore-rp-set-priority

ð ֳ Ô

ip pim ignore-rp-set-priority

ð Ô

ð Ô

˘ RP-SET RP ″I

ð ֳ Ô

ð Ô

RP ˘ RP ″I ˘ ֳ

ð Ô

```
Ruijie# configure terminal
Ruijie(config)# ip pim ignore-rp-set-priority
```

42.1.10 ip pim jp-timer

ð ֳ Ô

ip pim jp-timer *interval-seconds*

ð Ô

interval-seconds	৸ <1-65535>˘ Æ ѝ

ð Ô

˘ Join/Prune 60s

ð ֽ Ô

ð Ô

Join/Prune

ð Ô

```
Ruijie# configure terminal
Ruijie(config)# ip pim jp-timer 50
```

42.1.11 ip pim mib

ð ֽ Ô

ip pim mib dense-mode

ð Ô

˘ sparse-mode MIB

ð ֽ Ô

ð Ô

dense-mode MIB ˘ ֽ

ð Ô

```
Ruijie# configure terminal
Ruijie(config)# ip pim mib dense-mode
```

42.1.12 ip pim neighbor-filter

ð ֽ Ô

ip pim neighbor-filter *access_list*

ð Ô

access_list	access-listˊ acl ѝ 1-99ʼ ≠ ৸ acl

ð Ô

˘ ╗

ð ৡ Ô

ð Ô

˘ ╗ PIM ˘ ⁸ Â ৸
˘ PIM-SM a б ^ peering˜
˘ б Â

ð Ô

```
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
```

ð ৡ Ô

access-list

ð Ô

```
Ruijie# configure terminal
Ruijie(config)# interface g 0/3
Ruijie(config-if)# ip pim query-interval 123
```

42.1.14 ip pim register-rate-limit

ð ¸ Ô

ip pim register-rate-limit *rate*

ð Ô

rate	register ˘ ¼ <1-65535>

ð Ô

ৡ ⁄˘ ¨Ą RP ⌟ ˘ a ⌟ ˘ a
¨Ą Â

ð Ô

```
Ruijie# configure terminal
Ruijie(config)# ip pim register-rp-reachability
```

42.1.16 ip pim register-source

ð ৡ Ô ster-6(urce)]TJTT0 1 Tf57 Tc 0 T0 177247 0 Td{y

ð ৡ Ô

ip pim register-suppression *seconds*

ð Ô

seconds	¨Ą ⁸ ˇ ৸ <11-21843>˘ Æ ৸ Â

ð Ô

ˇ ¨Ą ⁸ 60 Â

ð ৡ Ô

ð Ô

DR Э Ⱨ DR Э ¨Ą ⁸ ’ ip pim rp-register-kat ৡ ˇ RP Э Ⱨ RP keepalive Â

ð Ô

```
Ruijie# configure terminal
Ruijie(config)# ip pim register-suppression 100
```

42.1.18 ip pim rp-address

ð ৡ Ô

ip pim rp-address *rp-address* [*access_list*]

ð Ô

rp-address	RP IP
access_list	৸ ˇ access-list˙ acl ৸ <1-99> ৯ <1300-1999>’ ≠ ৸ acl Â ˇ Â

ð Ô

ˇ RP

ð ৡ Ô

ð Ô

RP ≠ RP BSR ⁸ ⅄
Â ֳ Ю '

¸ BSR ⁸ RP ⅄ ˘ ″I ╟ Â

¸ RP ⅄Л ^ ACL˜
^ a ACL˜ ˘ RP a
Â

¸ RP Ь ⅄ ˘ IP RP ″I
Â

¸ ⅄ ACL Ⱶ ÂACL ˘
ѝ 224/4 Â

¸ Л˘ RP RP
˘ RP ˘
IP Â ѝ RP
˘ ≠ IP ″I Э Â

¸ RP ˘ ÿ
RP ѝ RP Â

ð Ô

```
Ruijie# configure terminal
Ruijie(config)# ip pim rp-address 210.34.0.55
Ruijie(config)# ip pim rp-address 210.34.0.55 4
Ruijie(config)# access-list 4 permit 225.1.1.1
0.0.0.255
```

ð ֳ Ô

access-list

42.1.19 ip pim rp-candidate

ð ֳ Ô

ip pim rp-candidate *interface-type interface-number [***priority** *priority-value][i***nterval** *interval-seconds][***group-list** *access_list]*

ð Ô

interface-type interface-number	
priority-value	⅄ ˘ ⅄ ѝ <0-255>˘ priority priority-value ˘ ″I 192
Interval-seconds	⅄ ˘ ⅄ ѝ <1-16383> ˘ interval interval-seconds ˘ interval-seconds 60s

access_list	˩ ˇ acl ˀ 1-99ʼ ≠ ˩ aclʼ group-list access_list ˇ Â

ð Ô

ˇ RP

ð ֳ Ô

ð Ô

PIM-SM ˇ RPT Л∪ RP ˀ Â
BSR ˩ˇ C-RP BSR C-RP ˇ Ą
BSR PIM Â

ˀ RPˇ ж ֳ ˩ Л∪ Э acl
Â ˩ permit aceˇ a deny
ace Â

ð Ô

```
Ruijie#
```

ð Ô

RP KAT

ð Ô

```
Ruijie# configure terminal
Ruijie(config)# ip pim rp-register-kat 250
```

42.1.21 ip pim sparse-mode

ð ৡ Ô

ip pim sparse-mode

ð Ô

Э˘ PIM-SM ╟

ð ৡ Ô

ð Ô

Э PIM-SM ˘ ৡ Â

ð Ô

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

&

╟ PIM-SM ˘ Ю ╟ ╥ ˘
╟ PIM-SM˘ ≠ a Â

╟ PIM-SM ┘ ˘ IGMP Э╡ ╟ ╟˘ a ╟ Â

ৡ ˘ ľ Failed to enable PIM-SM on < ┘ >, resource temporarily unavailable, please try again Ľ˘ Ą ৡ Â

ৡ ˘ ľ PIM-SM Configure failed! VIF limit exceeded in NSM!!! Ľ˘ ┘ Э Â ÿ Ю PIM-SM ˘ a PIM-SM PIM-DM DVMRP Â

a ┘ ┘ Э a ┘ a ┘ v4 Â

42.1.22 ip pim spt-threshold

ð ৡ Ô

ip pim spt-threshold [**group-list** *access-list*]

ð Ô

access-list	৶ ˘ access-list acl ৸ 1-99 ৯ 1300-1999 ≠ ৴ acl Â group-list access-list ˘ SPT ⁋

ð Ô

˘ a ╟ SPT ⁋

ð ৡ Ô

ð Ô

RPT SPT ৶ ╖ ˘ ৡ'

৶ SPT ⁋ ˘ Э group-list

a group-list ˘ SPT ⁋ Â

ð Ô

```
Ruijie# configure terminal
Ruijie(config)# ip pim spt-threshold
Ruijie(config)# ip pim spt-threshold group-list 12
Ruijie(config)# access-list 12 permit 225.1.1.1
0.0.0.255
```

ð ৡ Ô

access-list

42.1.23 ip pim ssm

ð ৡ Ô

ip pim ssm { **default** | **range** *access_list}*

ð Ô

default	½' 232/8
access_list	acl ½ 1-99' ≠ ¼ acl

ð Ô

╟ SSM

ð ¾ Ô

ð Ô

╟ PIM-SSM ╟ PIM-SSM¯ ¾

ð Ô

Ю ¾ 232/8 Â

```
Ruijie# configure terminal
Ruijie(config)# ip pim ssm default
```

Ю ¾ ½ 10 Â

```
Ruijie(config)# ip pim ssm range 10
Ruijie(config)# access-list 10 permit 232.0.0.1
0.0.0.255
```

ð ¾Ô

access-list

42.1.24 show debugging

ð ¾ Ô

show debugging

ð Ô

ð ¾ Ô

/ /

ð Ô

ð Ô

```
Ruijie #show debugging
PIM-SM Debugging status:
  PIM packet debugging is on
```

42.1.25 show ip pim sparse-mode bsr-router

ð ¸ Ô

show ip pim sparse-mode bsr-router

ð Ô

ð ¸ Ô

/ /

ð Ô

BSR .

ð Ô

```
Ruijie# show ip pim sparse-mode bsr-router
PIMv2 Bootstrap information
This system is the Bootstrap Router (BSR)
BSR address: 192.168.127.1
Uptime:      01d23h14m, BSR Priority: 64, Hash mask
length: 10
Next bootstrap message in 00:00:42
Role: Candidate BSR   Priority: 64, Hash mask length: 10
State: Elected BSR
Candidate RP: 30.30.100.200(GigabitEthernet 0/3)
Advertisement interval 60 seconds
Next Cand_RP_advertisement in 00:00:32
```

42.1.26 show ip pim sparse-mode interface

ð ¸ Ô

show ip pim sparse-mode interface [*interface-type interface-number* [**detail**]]

ð Ô

interface-type *interface-number*	˘ ˘ ¸
detail	˘ ˘ ¸

ð ¸ Ô

/ /

ð Ô

PIM SM

ð Ô

```
Ruijie# show ip pim sparse-mode interface detail
GigabitEthernet 0/3 (vif 2):
Address 30.30.100.200, DR 30.30.100.200
Hello period 30 seconds, Next Hello in 13 seconds
Triggered Hello period 5 seconds
Neighbors:
30.30.100.1
```

42.1.27 show ip pim sparse-mode local-members

ð ¾ Ô

show ip pim sparse-mode local-members
[*interface-type interface-number*]

ð Ô

interface-type *interface-number*	¼ ˘ ˘ ¾

ð ¾ Ô

/ /

ð Ô

PIM SM Э IGMP Â

ð Ô

```
Ruijie# show ip pim sparse-mode local-members
PIM Local membership information
GigabitEthernet 0/3:
(*, 225.1.1.1) : Include
Loopback 1:
```

42.1.28 show ip pim sparse-mode mroute

ð ¾ Ô

show ip pim sparse-mode mroute [*group_address* | *source_address*]

ð Ô

group_address	A.B.C.D Â
source_address	A.B.C.D Â

ð ৡ Ô

/ /

ð Ô

Â ৸ ˘ ˘
˘ a é Âa ৸
ч ч Â

42.1.29 show ip pim sparse-mode neighbor

ð ৡ Ô

show ip pim sparse-mode neighbor [*detail*]

ð Ô

detail	৸ ˘

ð ৡ Ô

/ /

ð Ô

Â

ð Ô

```
Ruijie# show ip pim sparse-mode neighbor detail
Nbr 5.5.5.3 (VLAN 1)
 Expires in 81 seconds
```

42.1.30 show ip pim sparse-mode nexthop

ð ৡ Ô

show ip pim sparse-mode nexthop

ð Ô

ð ৡ Ô

/ /

ð Ô

Ю ˘ Ю /ʃ˘ ˘ metric Â

42.1.31 show ip pim sparse-mode rp mapping

ð ֳ Ô

show ip pim sparse-mode rp mapping

ð Ô

ð ֳ Ô

/ /

ð Ô

Э RP˝ Л∪ Ł

ð Ô

```
Ruijie# show ip pim sparse-mode rp mapping
PIM Group-to-RP Mappings
Group(s): 224.0.0.0/4
RP: 30.30.200.1
Info source: 30.30.200.1, via bootstrap, priority 192
Uptime: 00:00:51, expires: 00:01:39
RP: 30.30.100.1
Info source: 30.30.200.1, via bootstrap, priority 192
Uptime: 00:19:14, expires: 00:01:38
Group(s): 224.0.0.0/4, Static
RP: 100.100.100.100
Uptime: 00:45:35
```

42.1.32 show ip pim sparse-mode rp-hash

ð ֳ Ô

show ip pim sparse-mode rp-hash *group-address*

ð Ô

group-address	

ð ֳ Ô

/ /

43

43.1

- **clear ip mroute**
- **clear ip mroute statistics**
- **ip mroute**
- **ip multicast route-limit**
- **ip multicast ttl-threshold**
- **ip multicast-routing**
- **ip multicast boundary**
- **show ip mroute**
- **show ip rpf**
- **show ip mvif**

43.1.1 clear ip mroute

IP Â

clear ip mroute {* | *group-address* [*source -address*]}

Ô

*	Â
group-address	Â
source-address	Â

Ô

Â

Ô

ЛЮ й й 230.0.0.1 '

```
Ruijie# clear ip mroute 230.0.0.1
```

Ô

show ip mroute	Â

43.1.2 clear ip mroute statistics

ʒ IP Â

clear ip mroute statistics {***** | *group-address* [*source -address*]}

ð Ô

rpf-address	
interface-type interface-number	Л
distance	RPF Â ѝ 0 Л ѝ <1-255>

ð Ô

a *Distance* *Distance* ѝ 0

ð Ô

Â

ð Ô

RFF Â Ю ір Ж ѝ Â

ЛЪЮ Л 172.30.10.13

```
Ruijie(config)# ip mroute 172.16.0.0 255.255.0.0 172.30.10.13
```

43.1.4 ip multicast route-limit

8 Â

ip multicast route-limit *limit* [*threshold*]

no ip multicast route-limit *limit* [*threshold*]

ð Ô

limit	1~2147483647 Â ѝ 1024 Â
threshold	Л Â ѝ 2147483647.

ð Ô

limit ѝ 1024

threshold ѝ 2147483647

ð ϡ Ô

Â

ð Ô

ϡ ⁸ ╗ IPv6 Â

~

a ⅃ /ι ˚ ˘ ˚ ˚ ˘
Ю Â

ð Ô

ЛЪЮ ⁸ ѝ 500 Â

```
Ruijie(config)# ip multicast route-limit 500
```

43.1.5 ip multicast ttl-threshold

ϡ TTLˆ Time-To-Live˜ Â ϡ **no** ϡ Â

ip multicast ttl-threshold *ttl-value*

no ip multicast ttl-threshold

ð Ô

ttl-value	TTL , ⅃ 0~255 Â

ð Ô

ttl-value' ѝ 1 Â

ð ϡ Ô

Â

ð Ô

⅃ Л ѝ TTL Â TTL
˘ ⅃ Л ˘ ÂTTL
˘ ⅃ Ь Э Â TTL ѝ 0 ˘
a ѝ Â

ð Ô

ЛЬЮ Э TTL й 5

```
Ruijie(config-if)# ip multicast ttl-threshold 5
```

43.1.6 ip multicast-routing

ʒ ╠ Â ʒ **no** Â

ip multicast-routing

no ip multicast-routing

ð Ô

Â

ð ʒ Ô

Â

ð Ô

ʒ ╠ IPv4 Â ╠ IPv4 ˘
≠ a ╠ Â

~

S8606 à S8610 à S8614 Э˘ ╖ IGMP SNOOPING SVGL à IVGL-SVGL ╖ Â ╖ ˘ IGMP SNOOPING SVGL IVGL-SVGL Â Ю ' ip

show ip mroute [*group-address*] [*source-address*] [**dense**][**sparse**] [**summary**] [**count**]

ð Ô

group-address	Â
source-address	Â
dense	PIMDM
sparse	PIMSM
summary	Â
count	Â

ð Ô

ð Ô

ЛЬЮ

```
Ruijie# show ip mroute
IP Multicast Routing Table
Flags: I - Immediate Stat, T - Timed Stat, F - Forwarder
installed
Timers: Uptime/Stat Expiry
Interface State: Interface (TTL)
(10.10.1.52, 224.0.1.3), uptime 00:00:31, stat expires
00:02:59
Owner PIM-SM, Flags: TF
Incoming interface: FastEthernet 2/1
Outgoing interface list:
FastEthernet 1/3
```

ЛЬЮ

```
Ruijie# show ip mroute 10.10.1.52 224.0.1.3
IP Multicast Routing Table
Flags: I - Immediate Stat, T - Timed Stat, F - Forwarder
installed
Timers: Uptime/Stat Expiry
Interface State: Interface (TTL)
(10.10.1.52, 224.0.1.3), uptime 00:03:24, stat expires
00:01:28
Owner PIM-SM, Flags: TF
Incoming interface: FastEthernet 2/1
Outgoing interface list:
```

FastEthernet 1/3

ЛЬЮ

```
Ruijie# show ip mroute count
IP Multicast Statistics
Total 1 routes using 132 bytes memory
Route limit/Route threshold: 2147483647/2147483647
Total NOCACHE/WRONGVIF/WHOLEPKT recv from fwd: 1/0/0
Total NOCACHE/WRONGVIF/WHOLEPKT sent to clients: 1/0/0
Immediate/Timed stat updates sent to clients: 0/0
Reg ACK recv/Reg NACK recv/Reg pkt sent: 0/0/0
Next stats poll: 00:01:10
Forwarding Counts: Pkt count/Byte count, Other Counts:
Wrong If pkts
Fwd msg counts: WRONGVIF/WHOLEPKT recv
Client msg counts: WRONGVIF/WHOLEPKT/Imm Stat/Timed
Stat sent
Reg pkt counts: Reg ACK recv/Reg NACK recv/Reg pkt sent
(10.10.1.52, 224.0.1.3), Forwarding: 2/19456, Other: 0
Fwd msg: 0/0, Client msg: 0/0/0/0, Reg: 0/0/0
```

ЛЬЮ

```
Ruijie# show ip mroute summary
IP Multicast Routing Table
Flags: I - Immediate Stat, T - Timed Stat, F - Forwarder
installed
Timers: Uptime/Stat Expiry
Interface State: Interface (TTL)
(10.10.1.52, 224.0.1.3), 00:01:32/00:03:20, PIM-SM,
Flags: T
```

Flags	I- T- F-
Timers:Uptime/Stat Expiry	˘
Interface State	
Owner	˘ ˩
Incoming interface	˘ б а ˘
Outgoing interface list	˘ Э

Forwarding Counts ' Pkt count/Byte count,	' /
Other Counts: Wrong If pkts	

ip multicast-routing	╟
ip pim dense-mode	Э ╟ PIM-DM
ip pim sparse-mode	Э ╟ PIM-SM

43.1.9 show ip rpf

RPF Â

show ip rpf {*source-address*}

source-address	

Â

ЛЬЮ 192.168.1.54 RPF

```
Ruijie# show ip rpf 192.168.1.54
RPF information for 192.168.1.54
RPF interface: VLAN 1
RPF neighbor: 0.0.0.0
RPF route: 192.168.1.0/24
RPF type: unicast (connected)
RPF recursion count: 0
Doing distance-preferred lookups across tables
Distance: 0
Metric: 0 RPF information for 192.168.1.54
RPF interface: VLAN 1
RPF neighbor: 0.0.0.0
RPF route: 192.168.1.0/24
RPF type: unicast (connected)
RPF recursion count: 0
Doing distance-preferred lookups across tables
```

```
Distance: 0
Metric: 0
```

43.1.10 show ip mvif

Â

show ip mvif { *interface-type interface-number* }

ð Ô

¸ *interface-type interface-number*	

ð ϡ Ô

Â

ð Ô

ЛЬЮ svi1

```
Ruijie# show ip mvif vlan 1
Interface              Vif    Owner       TTL   Local
Remote          Uptime
Idx   Module        Address         Address
VLAN 1            1      PIM-DM     2     192.168.1.1
0.0.0.0         00:13:16
```

43.2 IP

Ю ϡ ╟ IP '

¸

ð Ô

ð Ô

ð Ô

ˇ ⅃Ո Â

ð Ô

```
Ruijie# debug nsm mcast all
```

43.2.2 debug nsm mcast fib-msg

Â **no**

debug nsm mcast fib-msg

ð Ô

ð Ô

ð Ô

ˇ ⅃Ո Â

ð Ô

```
Ruijie# debug nsm mcast fib-msg
```

43.2.3 debug nsm mcast vif

ð Ô

ˇ ⅃ Л Â

ð Ô

```
Ruijie# debug nsm mcast vif
```

43.2.4 debug nsm mcast register

Ä Ä Â

no

debug nsm mcast register

ð Ô

ð Ô

ð Ô

ˇ ⅃ Л Ä Ä

Â

ð Ô

Ä Ä

```
Ruijie# debug nsm mcast register
```

43.2.5 debug nsm mcast stats

Â

no

debug nsm mcast stats

ð Ô

ð Ô

ð Ô

Ruijie# **debug nsm mcast stats**

Ruijie(config-mpls-router)#advertise-labels for bgp-routes

44.2 discovery targeted-hello

hello no

discovery targeted-hello {**holdtime** | **interval**} *seconds*

no discovery targeted-hello {**holdtime** | **interval**}

holdtime	hello
interval	hello
seconds	1-65535 holdtime 65535

hello 45 hello 5 1/9

config-mpls-router

target hello holdtime interval LDP a targeted hello

```
Ruijie(config)# mpls router ldp
Ruijie(config-mpls-router)#  discovery  target-hello
holdtime 90
```

show mpls ldp parameters	LDP

44.3 label-merge

˘ no Â

[**no**] **label-merge**

ð Ô

Â

ð Ô

config-mpls-router

ð Ô

DU¦ ⁸ ˘ ˘ a Â
LDP Æ Â

ð Ô

```
Ruijie(config)# mpls router ldp
Ruijie(config-mpls-router)# label-merge
```

ð Ô

Show mpls ldp parameters	LDP
mpls ldp distribution-mode	¦

44.4 label-retention-mode

˘ no Â

label-retention-mode {**liberal** | **conservative**}

[**no**] **label-retention-mode**

ð Ô

liberal

¾ LDP Æ Â

ð Ô

```
Ruijie(config)# mpls router ldp
Ruijie(config-mpls-router)#label-retention-mode
liberal
```

ð ¾ Ô

¾	
show mpls ldp parameters	LDP

44.5 label-switching

MPLS Ł´ MPLS Ł ˘ ¾
MPLS Â

¾ ÞO'

[**no**] **label-switching**

ð Ô

ð Ô

MPLS Ł´ MPLS Ł ˘ è a
MPLS Â

ð ¾ Ô

ð Ô

¾ MPLS Ł´ ^ M8600-MPLS˜ MPLS Ł
Â

ð Ô

```
Ruijie(config)# interface Gi4/1
Ruijie(config-if)# label-switching
```

ð ¾ Ô

¾	
show mpls label-pool	

44.6 ldp router-id

LDP LSR ID no Â

[**no**] **ldp router-id** *A.B.C.D*

ð Ô

A.B.C.D	

ð Ô

Router ID LDP LSR ID Â

ð Ô

config-mpls-router

ð Ô

ldp router-id Â LDP **ldp router-id**
transport-address **ldp router-id** LSR
Â

ð Ô

```
Ruijie(config-mpls-router)# ldp router-id 10.10.10.30
```

ð Ô

show mpls ldp parameter	LDP

44.7 loop-detection

no Â

[**no**]**loop-detection**

ð Ô

Â

ð Ô

config-mpls-router

ð Ô

LDP Æ Â

ð Ô

```
Ruijie(config)# mpls router ldp
```

```
Ruijie(config-mpls-router)# loop-detection
```

show mpls ldp parameters	LDP
mpls ldp max-path-vector	LDP
mpls ldp max-hop-count	

44.8 lsp-control-mode

LDP no

lsp-control-mode {**independent** | **ordered**}

no lsp-control-mode

independent	
ordered	

config-mpls-router

LDP

LDP LDP

```
Ruijie(config)# mpls router ldp
Ruijie(config-mpls-router)# lsp-control-mode ordered
```

show mpls ldp parameters	LDP

44.9 mpls ip

╟ MPLS no

a MPLS MPLS LDP LDP LSP

MPLS

ð Ô

```
Ruijie(config)# interface Gi4/1
Ruijie(config-if)# mpls ip
```

ð Ô

mpls ldp hello-interval	hello
mpls ldp hello-holdtime	hello

44.11 mpls ip fragment

IP MPLS MPLS MTU

[**no**] **mpls ip fragment**

ð Ô

ð Ô

IP MPLS MPLS MTU IP MPLS

ð Ô

ð Ô

MTU a **no mpls ip fragment** IP MPLS MPLS MTU

ð Ô

```
Ruijie(config)# no mpls ip fragment
```

ð Ô

mpls ip	MPLS

44.12 mpls ip icmp forward

ˆ γ˜ ICMP ˘

PE ‘Ą Â J 4 Z€Ë• žï¼> XP 0.0057 Tc 0 Tw 2.7833>-6<18791B5B>-68

Â

ð Ô

no mpls ip ttl expiration MPLS TTL
Â

ð Ô

```
Ruijie(config)# no mpls ip ttl expiration
```

ð Ô

mpls ip	MPLS

44.14 mpls ip ttl propagate

MPLS IP TTL Â

mpls ip ttl propagate {**public** | **vpn**}

no mpls ip ttl propagate

ð Ô

public	TTL
vpn	TTL

ð Ô

TTL Â

ð Ô

ð Ô

MPLS TTL ' TTL TTL a Â

¸ TTL ' Â è é ˘ Push ˘
TTL ÿ IP MPLS TTL '
Pop ˘ IP MPLS TTL ÿ
TTL Â

¸ TTL a ' è é Push ˘
TTL ù 255 ÂPop ˘ IP MPLS
TTL Â

ð Ô

TTL

```
Ruijie(config)# no mpls ip ttl propagate public
```

mpls ip	MPLS

44.15 mpls ldp distribution-mode

LDP

mpls ldp distribution-mode {**dod | du**}

no mpls ldp distribution-mode

dod	
du	

LDP Э hello ˘ Л∪ ù Æ˘ no
ù Â

mpls ldp hello-holdtime <*1-65535*>

no mpls ldp hello-holdtime

ð Ô

<*1-65535*>	hello ˘ Л∪ ù Æ˘ 65535 a Â

ð Ô

15 Â

ð ¾ Ô

ð Ô

¾ ¬ ⁸ LDP Link Hello Â ¾˘ ¬
Ю Hello ¬ ˘ Ю

<1-65535>	Hello

ð Ô

5 Â

ð Ô

ð Ô

hello-holdtime Â LDP a

8 LDP Link Hello Â

8 Hello Holdtime **discovery targeted-hello**

Â

ð Ô

LDP Ю hello 10

```
Ruijie(config) # interface vlan 10
Ruijie(config-if)# mpls ldp hello-interval 10
```

ð Ô

mpls ldp hello-holdtime	hello
discovery targeted-hello	8 hello

ð Ô

ý LDP a ¸ ˘ Ì LDP Â
ý a ⁸ LDP Â ⁸
LDP Keepalive Holdtime **targeted-session holdtime**
ý Â

ð Ô

LDP Ю Keepalive й 90

```
Ruijie(config) # interface vlan 10
Ruijie(config-if)# mpls ldp keepalive-holdtime 90
```

ð ý Ô

targeted-session holdtime	⁸ keepalive

44.19 mpls ldp max-hop-count

LDP Ю ˘ no Â

mpls ldp max-hop-count *<1-255>*

no mpls ldp max-hop-count

ð Ô

<1-255>	

ð Ô

й 254 Â

ð ý Ô

ð Ô

¸ Ì˘ ý Â LDP
Hop Count ˘ й
Â ý ″I Ю
a ˘ ¸ Ì Â

ð Ô

LDP Ю hop count й 30

```
Ruijie(config) # interface vlan 10
Ruijie(config-if)# mpls ldp max-hop-count 30
```

loop-detection	LDP

44.20 mpls ldp max-label-requests

LDP

mpls ldp max-label-requests *<0-255>*

no mpls ldp max-label-requests

<0-255>	

LDP

```
Ruijie(config) # interface vlan 10
Ruijie(config-if)# mpls ldp max-label-requests 5
```

mpls ldp distribution-mode	

44.21 mpls ldp max-path-vector

LDP Ю ˘ no
Â

mpls ldp max-path-vector *<0-254>*

no mpls ldp max-path-vector

ð Ô

<0-254>	

ð Ô

ы 254 Â

ð Ô

ð Ô

ы LDP ˘ Â LDP
LSR ID
˘ ы Â
LDP a ы ˘ Л LDP Â

ð Ô

LDP Ю ы 10 Â

```
Ruijie(config)# interface vlan 10
Ruijie(config-if)# mpls ldp max-path-vector 10
```

ð Ô

loop-detection	LDP

44.22 mpls ldp max-pdu

LDP ^ PDU˜ ˘ no
ы Â

mpls ldp max-pdu *<256-4096>*

[no] mpls ldp max-pdu

ð Ô

<256-4096>	LDP PDU

ð Ô

4096 Â

ð Ô

ð Ô

Ю LDP a LDP
Â

ð Ô

Ю LDP 256 Â

```
Ruijie(config)# interface vlan 10
Ruijie(config-if)# mpls ldp max-pdu 256
```

44.23 transport-address

no

[**no**] **transport-address** [**interface**|*ipaddr*|*interface_name*]

ð Ô

interface	Э IP
ipaddr	IP
interface _name	IP

ð Ô

LDP LSR ID transport-address

ð Ô

config-mpls-router

ð Ô

```
Ruijie(config-mpls-router)#transport-address
192.168.0.1
```

ð ÔÎ

show mpls ldp parameters	LDP

44.24 mpls mtu

mpls mtu Â

mpls mtu <*64-6535*>

no mpls mtu

ð Ô

<*64-65535*>	

ð Ô

mpls mtu б MTU ╗ Э ч Â

ð Ô

ð Ô

MPLS MTU Ю MPLS MTU й MTU ╗ Э 8 ÂMPLS MTU ¤ MPLS MTU MPLS IP Â MPLS MTU a Â

Э MTU MTU Â MTU Ю **mtu** Â

ð Ô

```
Ruijie(config)# interface Gi4/1
Ruijie(config-if)# mpls mtu 1510
```

ð ÔÎ

mpls ip	MPLS

44.25 mpls router ldp

¾ LDP ˘ ¾ no LDP Â

[**no**] **mpls router ldp**

ð Ô

LDP Â

ð ¾ Ô

ð Ô

LDP LDP ˘ ЮO ¾'

```
Ruijie(config)# mpls router ldp
Ruijie(config-mpls-router)
```

44.26 mpls static ftn

¾ ¶ FTN FTN Â ┘Л∪ no F
TN FTN Â ¾ ЮO

mpls static ftn *A.B.C.D/Mask* **out-label** *label* **nexthop** *interface-name nexthop-ip*

no mpls static ftn *A.B.C.D/Mask*

ð Ô

A.B.C.D/Mask	FEC˘
out-label *label*	FEC
nexthop *interface-name nexthop-ip*	FEC ЮO ˘ ЮO Л∪ ЮO IP tr8s2(#ƒ№2¦F€ .ѳ24€ (ĩ3(ħntrğ2¦b‘@1ѕ4V@

```
Ruijie(config)# mpls static ftn 192.168.0.0/16
out-label 100 nexthop gi4/1 10.10.10.1
```

ð

show mpls forwarding-table	ÿ FTN

44.27 mpls static l3vpn-ftn

L3 VPN FTN no FTN

mpls static l3vpn-ftn *vrf-name A.B.C.D/Mask* **out-label** *label* **remote-pe** *ip-addr*

mpls static l3vpn-ftn *vrf-name A.B.C.D/Mask* **local-forward nexthop** *interface-name nexthop-ip*

no mpls static l3vpn-ftn *vrf A.B.C.D/Mask*

ð

vrf-name	FTN VRF FTN
A.B.C.D/Mask	Fec
out-label *label*	FTN LSP è PE
remote-pe *ip-addr*	PE
local-forward nexthop *interface-name nexthop-ip*	FTN PE IP

ð

ð

vrf FTN FTN MPLS IP VRF VRF FTN IP IP 0 FTN IP

ð Ô

```
Ruijie(config)# mpls static l3vpn-ftn 192.168.0.0/16
out-label 100 remote-pe 10.10.10.1
```

ð Ô

show mpls forwarding-table	ÿ FTN

44.28 mpls static l2vc-ftn

VC FTN Â Л Ъ no FTN Â Ю

mpls static l2vc-ftn *vc_id vc_peer_ip* **out_label** *label*

no mpls static l2vc-ftn *vc_id vc_peer_ip*

ð Ô

vc_id	vc id
vc_peer_ip	Vc PE IP
out_label *label*	VC FTN

ð Ô

ð Ô

й vc ftn ˇ ÿ VC AC ˇ ftn Э vc peer ip PE LSP Â

ð Ô

```
Ruijie(config)# mpls static l2vc-ftn 1 10.10.10.1
out_label 21
```

ð Ô

show mpls l2vc ftn_table	vc ftn
show mpls forwarding-table	MPLS

44.29 mpls static ilm in-label

ʒ ╗ ILM ILM ˘ ʒ no ⅃Л
ILM Â ʒ Ю'

mpls static ilm in-label *in_label* **forward-action swap-label** *label* **nexthop** *interface-name nexthop-ip* **fec** A.B.C.D/M

mpls static ilm in-label *in_label* **forward-action pop-l3vpn-nexthop** *vrf-name* **nexthop** *interface-name nexthop-ip* **fec** *A.B.C.D/Mask*

mpls static ilm in-label *in_label* **forward-action pop-l2vc-destport** *interface-name* **fec** *vc_id*

no mpls static ilm in-label *in_label*

ð Ô

in_label	ILM
forward-action	ILM ѝ' **swap-label'** Ώ ILM ˘ Â **pop-l3vpn-nexthop'** L3 VPN ILM ˘ ˘ VRF Ю Â **pop-l2vc-destport'** L2 VPN ILM ˘ ˘ ÿ Â
label	swap-label ѝ ˘ ѐ
vrf-name	pop-l3vpn-nexthop ѝ ѝ ˘ ILM VPN VRF Â
interface-name	pop-l2vc-destport ѝ ѝ ˘ ѐ Â
nexthop *interface-name* *nexthop-ip*	Ю ˘ Ю Ю IP
fec	ILM ѝ FEC
A.B.C.D/Mask	l3 vpn fec ˘
vc_id	l2vpn fec ˘ VC Â

ð ʒ Ô

ð Ô

ʒ ILM ╗ ILM Â MPLS ╗
IP ⅄˘ ILM IP

ˉ Ю ˘ ˘ IP à
╟ Â

ð Ô

```
Ruijie(config)# mpls static ilm in-label 20
forward-action swap-label 30 nexthop gi4/2 10.10.10.1
fec 172.16.0.0/26
```

ð ˉ Ô

ˉ	
show mpls forwarding-table	MPLS

44.30 neighbor

ldp ˘ no ˉ ldp Â

[**no**] **neighbor** *A.B.C.D*

ð Ô

A.B.C.D	LSR Router ID

ð Ô

Ю LDP Â

ð ˉ Ô

config-mpls-router

ð Ô

LDP ˘ ч LSR Â
л л й ˘ л Э
й è LDP Â

ð Ô

10.10.10.1 й LSR

```
Ruijie(config)# mpls router ldp
Ruijie(config-mpls-router)# neighbor 10.10.10.1
```

ð ˉ Ô

ˉ	
show mpls ldp discovery	LDP

show mpls ldp neighbor	LDP

44.31 propagate-release

˘ no

ftn

ilm

vc vc MPLS

ip ip mpls

detail mpls ;

vrf VRF MPLS ;

summary MPLS ;

MPLS ,

Prefix or Tunnel Id: IP ;

Outgoing interface:

Next Hop:

```
Ruijie# sh mpls forwarding-table summary
MPLS forwarding is ON
Enable count:1
ILM entrys:14
ILM changes:14
ILM failed changes :0
IP FTN entrys:0
IP FTN changes:4
IP FTN faild changes:0
L2 FTN entrys:0
L2 FTN changes:0
L2 FTN faild changes:0
In label packets:0
Out label packets:0
Send label packets:0
In ip packets:0
Out ip packets:0
Out ip statck packets:0
Forwarding packets:0
Fragment packets:0
Fragment error packets:0
Label error packets:0
Label failed packets:0
Ttl over packets:0
Buffer failed packets:0
Ip don't fragment packets:0
Other failed packets:0
```

44.33 show mpls label-pool

show mpls label-pool [*label_space*]

label_space

label_space

ð Ô

Â à
à ˘ Â Â

ð Ô

```
Ruijie# show mpls label-pool
label space: 0
label pool bucket size 512
min label 16, max label 1048575
label block used 2, free 2046
CLI:    0,    1    (Include label [16,1023], reserved)
LDP:    3,    4
```

ð Ô


```
192.168.4.0/24  remote binding:  no outlabel lsr:
192.168.0.3:0
192.168.0.100/32  local binding:   label: gen impl-null
192.168.4.0/24  local binding:   label: gen impl-null
```

ð Ô

show mpls ldp neighbor	LDP

44.35 show mpls ldp discovery

LDP Â

show mpls ldp discovery

ð Ô

ð Ô

ð Ô

ð Ô

Э LDP ˇ LDP ˇ LDP
hello ˇ ˇ hello

ð Ô

LDP Â

```
Ruijie# show mpls ldp discovery
Local LDP Identifier:
   8.8.8.8:0
   Discovery Sources:
   Interfaces:
      GigabitEthernet 2/1 (ldp): xmit/recv
         LDP Ident: 10.30.10.10:0
      GigabitEthernet 2/2 (ldp): xmit
   Targeted Hellos:
      8.8.8.8 -> 10.5.0.1 (ldp): active, xmit
      8.8.8.8 -> 10.30.10.10 (ldp): active/passive,
xmit
      2.2.2.2 -> 10.30.10.10 (ldp): passive, xmit/recv
         LDP Ident: 10.30.10.10:0
```

Local LDP Identifier	LDP
Interfaces	LDP
xmit	LDP Hello
recv	LDP Hello
Targeted Hellos	targeted Hello
active	LSR targeted Hello
passive	LSR targeted Hello LSR Targeted Hello

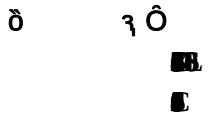
show mpls ldp interface	LDP

44.36 show mpls ldp neighbor

LDP

```
        Addresses bound to peer LDP Ident:
          10.20.10.10    192.168.201.220  192.168.198.1
10.5.0.1
```


```
    Targeted  Session  Keepalive  HoldTime/Interval:
180/60 sec
    Targeted Hello HoldTime/Interval: 90/10 sec
```



```
Session attach socket FD[2572], read thread is 0xc6019c0,
write thread is (nil)
LDP Peer Address:
192.168.4.1
192.168.0.2
192.168.3.2
```

44.39 show mpls summary

MPLS Â

show mpls summary

ð Ô

ð Ô

MPLS ˇ à ˇ
à ˇ MPLS ╗
Â

ð Ô

```
Ruijie# show mpls summary
Per label-space information: //                    ˇ
  0
Label-space 0 is using minimum label: 16 and maximum
label: 1048575            //
Label-switching Interface:     //
Interface              Label space
GigabitEthernet 4/1      0
GigabitEthernet 4/2      0
Total number of mpls interface is 2
```

ð Ô

label-switching	

44.40 targeted-session holdtime

keepalive ˇ no Â

targeted-session holdtime *<15-65535>*

ð Ô

15-65535	˘ Л∪ и Æ Â

ð Ô

Ю LDP ⁸ LDP ˘ è и 180 ˘ keepalive и 60 LDP 1/3 Â

ð ҷ Ô

config-mpls-router

ð Ô

ҷ ↓ ⁸ LDP ˘ з LDP a Â ҷ Л LDP Â

ð Ô

⁸ LDP и 90 Â

```
Ruijie(config)# mpls router ldp
Router(config-mpls-router)# targeted-session holdtime
90
```

ð ҷ Ô

ҷ	
show mpls ldp parameters	LDP

Ы vpn Â

ð ¾ Ô

Router

ð Ô

¾ PE VPN ˘ **address-family VPN** Â **exit-address-family** ¾ **addres s-family VPN** Â

ð Ô

```
Ruijie(config)# router bgp 100
Ruijie(config-router)# address-family vpnv4
```

ð ¾ Ô

¾	
neighbor activate	
exit-address-family	

45.3 clear ip bgp vrf

¾ Æ vrf Â

clear ip bgp vrf *vrf-name* [* | *address*] [[**soft**] [**in** | **out**]]

ð Ô

vrf-name	vrf ♩
*	Æ vrf Ю BGP Â
address	Æ vrf Ю б peer BGP Â
ipv4 unicast	ipv4
in	a ╗ **soft˘** Æ ў ╠ Â
out	a ╗ **soft˘** Æ BGP speaker ў ╠ Â
soft	Æ˘ Æ Â
soft in	Æ˘ Æ Â
soft out	Æ˘ ↑ Æ Â

ð Ô

ð ¾ Ô

Â

ð Ô

¾ Æ vrf BGP Â

ð Ô

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

45.4 exit address-family

exit address-family

¾ VRF vpn

ð ¾ Ô

ð Ô

```
Ruijie(config)# router bgp 100
Ruijie(config-router)# address-family vpnv4 unicast
Ruijie(config-router-af)# exit address-family
```

45.5 ip route static inter-vrf

[**no**] **ip route static inter-vrf**

VRF

ð Ô

VRF Â

ð ¾ Ô

ð Ô

no ip route static inter-vrf ¤ vrf

a Â ╟ vrf ˘ ¨Ą ˘

ÞO ˘ vrf Â

*Aug 7 10:58:34: %NSM-6-ROUTESACROSSVRF: **Un-installing r oute** [*x.x.x.x/8*] **from global routing table with outgoing interfac e** *x/x.*

ð Ô

```
Ruijie(config)# no ip route static inter-vrf
```

45.6 ip route vrf

[**no**] **ip route vrf** *vrf_name ip_addr mask interface next-hop-addres s* [**global**]

ѝ VRF ˘ no ҳ

ð Ô

vrf_name	VRF ɻ
ip_addr	
mask	
interface	
next_hop	Ю
global	Ю VRF

ð Ô

Â

ð ҳ Ô

ð Ô

ɻЛυ ѝ è vrf ˘ ÿ VRF ˘
global ˘ ѫ ѝ VRF Â
global ɻ ˘ a vrf ˘ ѫЛυ
vrf ѝ Â

~

global ÿ VRF ˘ a ɻ no ip route stati c inter-vrf ⁸ Â

ð Ô

```
Ruijie(config)# ip route vrf vrf1 10.10.10.0 255.255.
255.0 gi3/1 192.168.18.1
```

45.7 ip vrf

[**no**] **ip vrf** *vrf_name*

¾ ^ ~ VRF

ð Ô

vrf_name VRF ¸

ð Ô

ÞO ÞX VRF Â

ð ¾ Ô

ð Ô

```
Ruijie(config)# ip vrf vrf1
```

ð ¾Ô

¾	
ip vrf forwarding	VRF
show ip vrf	VRF
rd	¸ VRF rd
route-targert	¸ VRF rt

45.8 ip vrf forwarding

[**no**] **ip vrf forwarding** *vrf_name*

VRF ˘ no ¾

ð Ô

N Ô V , RÕ Æ‘ r Ti Ô

¢ Ю Â ¢ no
Ù Ú Â

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

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

ð Ô

peer-address	ˇ Ù IPv4 ˇ ≠ Ù IPv6
peer-group-name	Ù Ù a 32

ð Ô

ipv4 Ю

ð ¢ Ô

BGP

BGP IPv4

BGP IPv6

BGP IPv4 VRF

BGP VPNv4

ð Ô

ipv4 ¢ ˇ è ˇ
¢ Â

ð Ô

```
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
```

ð ¢ Ô

¢	
router bgp	BGP
neighbor remote-as	BGP

45.11 neighbor allowas-in

PE ˘ ֽ PE é PE AS ʃ
Â ֽ no ɻ é AS ʃ Â

neighbor {*peer-address* | *peer-group-name*} **allowas-in** *number*

no neighbor {[*peer-address* | *peer-group-name*} **allowas-in**

ð Ô

peer-address	
peer-group-name	ɻ ɻ a 32
number	AS ʃ ɯ 3 ɻ [1˘ 10]

ð Ô

allowas-in ╖

ð ֽ Ô

BGP VPN

BGP IPv4 VRF

ð Ô

ɳ spoke_hub ˘ PE Э ֽ˘ PE ɻ Ʌʊ
Ä Â PE Э ч vrf è
vrf PE ˘ CE˘ ʅ vrf CE
˘ PE Â

IBGP EBGP ɻ Ʌʊ Â

ð Ô

```
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 allowas-in
```

ð ֽ Ô

ֽ	
router bgp	BGP

¢ PE AS Â ¢ no ¬
Â

neighbor {*peer-address* | *peer-group-name*} **as-override**

no neighbor {*peer-address* | *peer-group-name*} **as-override**

ð Ô

peer-address	
peer-group-name	¬ ¬ a 32

ð Ô

as-override ¶

ð ¢ Ô

BGP IPv4 VRF

ð Ô

Ю BGP a é ¬ AS ª ˘
¢ ¬ Â AS ª˘ BGP ¬ Â ÿ ¬ AS ª
Â

vpn ˘ ¦ ч CE é ¬ AS ª˘ ж
Ю ч CE ¶ ˘ PE Э Э ¢ ª˘
¬ Â PE CE AS ª˘ ª CE ¬ Â

¬ EBGP ¶ Â

ð Ô

```
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
```

ð ¢ Ô

¢	
router bgp	BGP
neighbor remote-as	BGP

45.13 neighbor description

ֽ ѝ ( ) ˊ Â ֽ no ˩ Л
˩ Â

neighbor {*peer-address* | *peer-group-name*} **description** *text*

no neighbor {*peer-address* | *peer-group-name*} **description**

ð Ô

peer-address	
peer-group-name	˩ ˩ a 32
text	( ) ' 80

ð Ô

╖ Â

ð ֽ Ô

BGP

BGP IPV4 vrf

ð Ô

ֽ ѝ ˆ ˜ ╖ Â ˩ Л ╠
ˆ ˜ Â

ð 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 description
xyz.com
```

ð ֽ Ô

neighbor {*peer-address* | *peer-group-name*} **remote-as** *as-number*

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

ð Ô

peer-address	˘ ˩ IPv4 ˘ ≠ ˩ IPv6
peer-group-name	˩ ˩ a 32
as-number	BGP ( ) ⁄ı ' <1-65535>

ð Ô

BGP Â

ð ৡ Ô

BGP

BGP IPv4

BGP IPv6

BGP IPv4 VRF

ð Ô

9 ﻵ Nj S

ð Ô

peer-address	˘ ┘ IPv4 ˘ ≠ ┘ IPv6 Â
peer-group-name	┘ Â ┘ a 32 Â

ð Ô

Ⅶ

ð ৡ Ô

BGP

BGP IPv4

BGP IPv6

BGP IPv4 VRF

ð Ô

ৡ ┘ ( ) ˘ Â ৡ Ÿ ( ) Â

BGP ˘ ⊼ ৡ ˘ и ৡ˘ è Â

ð Ô

```
Ruijie(config)# router bgp 60
Ruijie(config-router)# neighbor 10.0.0.1 shutdown
```

ð ৡ Ô

ৡ	
router bgp	BGP
neighbor remote-as	BGP
show ip bgp summary	BGP

45.16 neighbor soo

ৡ Ⅼ Ŀ ˘ no ৡ ┘ Ⅼ Ŀ Â

neighbor [*peer-address* | *peer-group-name*] **soo** *soo-value*

no neighbor [*peer-address* | *peer-group-name*] **soo**

ð Ô

peer-address	
peer-group-name	¸ ¸ a 32
soo-value	soo soo_value ¸ Ù ч a ¸ ' ^ 1~ soo_value as_num' nn an_num Ω /ˇ nn ЊЖ ^ 2~ soo_value ip_addr' nn ip_addr IP ˇ nn ЊЖ

ð Ô

soo ¶

ð ¢ Ô

BGP IPv4VRF

ð Ô

CE ¬ ˇ ¢ ¸ Ù ÿ CE PE
CE Â

ð Ô

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

ð ¢ Ô

¢	
router bgp	BGP

45.17 rd

ЊЖ VRF rd Â

rd *rd_value*

ð Ô

rd_value RD

ð Ô

Ю RD ˘ RD й 0:0. Â

ð ֳ Ô

VRF

ð Ô

ЊЖ VRF˘ з й RD ˘ ╕ RD Â
RD ˘ ↓ vrf ˝I ˘ Л ̈Ą й RD
Â

VRF ↓ RD ˘ a й ЊЖ RD Â

ð Ô

```
Ruijie(config)# ip vrf vrf1
Ruijie(config-vrf)# rd 100:1
```

ð ֳ Ô

ֳ	
ip vrf	VRF
show ip vrf	VRF

45.18 redistribute

ˇ ֳ˘ ↓ Л∪ è BGP
ˇ ˘ ֳ no ↓ Л∪ ╖ è Â

redistribute *protocol-type* [**route-map** *map-tag*] [**metric** *metric-value*]
no redistribute *protocol-type* [**route-map** *map-tag*] [**metric** *metric-value*]

ð Ô

protocol-type	ˇ Л∪ Ю ' connected à static à rip
route-map *map-tag*	**route-map** ↓ **route-map**

metric *metric-value*	ǂ metric Â a

ð Ô

ǂ Â

ð ֿ Ô

BGP

BGP IPv4

BGP IPv6

BGP IPv4 VRF

ð Ô

˘

Â ˩ ˘

ǂ ˥ Â IP Â

' no ֿ ˘ ˘ ɜ ˘

no Â ˘ redistribute

no Â

' metric ˘ ″I route-map ˘

route-map ˘ route-map ˥ ' route-map

˘ metric ˘ metric '

ч ˘ ǂ Э Â

ð Ô

```
Ruijie(config-router)# redistribute static route-map
static-rmap
Ruijie(config-router)# no redistribute static
route-map static-rmap
Ruijie(config-router)# no redistribute static
```

ð ֿ Ô

ֿ	
show ip protocols	

45.19 redistribute ospf

ǂ ֿ˘ ˩ Л OSPF BGP

ǂ ˘ ֿ no ˩ Л ╖ è Â

redistribute ospf *process-id* [**route-map** *map-tag*] [**metric** *metric-value*] [**match internal external** [**1**|**2**] **nssa-external** [**1**|**2**]]

no redistribute ospf *process-id* [**route-map** *map-tag*] [**metric** *metric-value*] [**match** {**internal**|**external** [**1**|**2**]|**nssa-external** [**1**|**2**]}]

ð Ô

process-id	↑ OSPF Ո
route-map *map-tag*	**route-map** ɹ **route-map**
metric *metric-value*	↑ metric a
match	٦ OSPF
internal	OSPF internal ˘ ѝ ↑ ospf match
external [**1**|**2**]	OSPF external ˘ ɻ Ո ɛ 1 2ˇ a ˘ 1 2
nssa-external [**1**|**2**]	OSPF nssa-external ˘ ɻ Ո ɛ 1 2ˇ a ˘ 1 2

ð Ô

↑ OSPF Â

ð ֽ Ô

BGP

BGP IPv4

BGP IPv6

BGP IPv4 VRF

ð Ô

˘

Â ɻ ˘

↑ ٨ Â

&

no ֳ ˘ ˘ ɜ ˘ no
Â ˘ redistribute no
Â ˘ Â

~

OSPF ' ″I match OSPF
˘ Л ″Ą route-map Â metric
˘ ″I ĭ Э metric route-map ˘ route-map
˘ route-map Л ' route-map ˘
metric ˘ metric ' ч ˘
ĭ Э Â

ð Ô

```
Ruijie(config-router)# redistribute ospf 2 route-map
static-rmap
Ruijie(config-router)# no redistribute ospf 4 match
external route-map ospf-rmap
Ruijie(config-router)# no redistribute ospf 78
```

ð ֳ Ô

ֳ	
show ip protocols	

45.20 route-target

Ю Л VRF RT Â

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

ð Ô

import	import RT
export	export RT
both	imporot export

ð Ô

Ю Ю Route-Target Â

ð ¾ Ô

VRF

ð Ô

VRF ¬Ո RT ˘ ¬ ≠ ¬Ո Â

ð Ô

```
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
```

ð ¾ Ô

¾	
ip vrf	vrf

45.21 show ip bgp vpnv4

¾ VPN Â

show ip bgp vpnv4 all [*network* | **neighbor** [*address*] | **summary** | **label**]

show ip bgp vpvn4 vrf *vrf_name* [*network* | **summary** | **label**]

show ip bgp vpvn4 rd *rd_value* [*network* | **neighbor** [*address*] | **summary** | **label**]

ð Ô

network	

neighbor or

Metric	
Localprf	″I
Path	AS-path
i	ORIGIN IGP
e	ORIGIN EGP
?	ORIGIN IGP EGP Л∪ ὲ

45.22 show ip route vrf

٣ VRF Â

show ip route vrf *vrf_name* [*A.B.C.D mask*| **bgp | connected | isis |ospf | rip |static**]

ð Ô

vrf_name	VRF
A.B.C.D mask	
bgp	BGP
connected	
isis	ISIS
ospf	OSPF
rip	RIP
static	

ð ٣ Ô

ð Ô

```
Ruijie# show ip route vrf vrf1
Codes: C - connected, S - static, R - RIP,B - BGP
O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external
type 2
E1 - OSPF external type 1, E2 - OSPF external type 2
```

```
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2 ˘ ia
- IS-IS inter area
* - candidate default
B    192.168.0.1/32 , [200/0] via 192.168.0.2, 01:02:33
B    192.168.0.3/32 , [200/0] via 192.168.4.1 , 01:02:33
C    192.168.4.0/24 is directly connected ,eth1
```

ð ¾Ô

¾	
show ip vrf	vrf

45.23 show ip vrf

¾ VRF Â

show ip vrf [*vrf-name*]

ð Ô

vrf-name' VRF

ð ¾ Ô

ð Ô

VRF ¸ ˘ VRF ' V
RF ¸ ˘ VRF Â

ð Ô

```
Ruijie# show ip vrf vrf1
VRF pe1' default RD '  100' 2
Interfaces'
Eth0
Export VPN route-target communities'
RT ' 100' 30
No import VPN route-target community
No import route-map
```

ð ¾Ô

¾	
ip vrf	VRF
rd	RD
route-target	RT

ip vrf forwarding	VRF

46

46.1

ЛЪЮ ३

- **strom-control**
- **switchport protected**
- **switchport port-security**
- **switchport port-security aging**
- **switchport port-security mac-address**
- **port-security arp-check**

46.1.1 strom-control

⁸ Â ३ **no** ⁸ ╗ Â

storm-control {**broadcast** | **multicast** | **unicast**} [{**level** *percent* | **pps** *packets* | *rate-bps*}]

no storm-control {**broadcast** | **multicast** | **unicast**} [{**level** *percent* | **pps** *packets* | *rate-bps*}]

ð Ô

broadcast ' ⁸ ╗

multicast ' ɻ ⁸ ╗

unicast ' ɻ ⁸ ╗

percent ' Лъ ǂ 20 20%

packets ' Лъ pps ѝ Æ packets per second

Rate-bps '

64k-2M ' Лъ 64k ѝ Æ

2-100M ' Лъ 1M ѝ Æ

100M Лъ Э ' Лъ 8M ѝ Æ

ð Ô

Ю˘ à ⁸ ╗

ð ३ Ô

ỳ ʌˇ Ю a
γ ɻЛυ З ˇ б ɻЛυ Â
show interfaces ३

ð Ô

```
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# switchport protected
```

ð ३Ô

३	
show interfaces	Â

46.1.3 switchport port-security

Ⅱ ˇ Â ३ no
ˇ Â

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

no switchport port-security [**violation**]

ð Ô

port-security	
violation protect	ˇ Â
violation restrict	ˇ з trap Â
violation shutdown	ˇ à Trap з Â

ð Ô

Â

ð ३ Ô

ð Ô

ˇ ɻЛυ ⁸ Э MAC
Лυ IP(ɻ) ш ⁸ Â ỳ (
Ⅱ) ʌˇ ỳ
ˇ a ὲ Â ˇ ɻЛυ ⁸
Э ˇ ỳ 1 з ỳ

port-security aging static ╟ ¯
Â

show port-security ¾

ð Ô

```
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# switchport port-security aging time
8
Ruijie(config-if)# switchport port-security aging
static
```

ð ¾Ô

¾	
show port-security	Â

46.1.5 switchport port-security mac-address

Â ¾ no ˘
Â

switchport port-security [**mac-address** *mac-address* [**ip-address** {*ip-address* | *ipv6-address*}]] | [**maximum** *value*]

no switchport port-security [**mac-address** *mac-address* [**ip-address** {*ip-address* |*ipv6-address*}]] | [**maximum**]

ð Ô

	¸
mac-address *mac-address*	¸ Â
ip-address *ip-address*	¸ ù IP Â
ip-address *ipv6-address*	¸ ù IPV6 Â

maximum

ð Ô

Ù IP MAC ´ ¨ б
ACL Э ´ ¨ ˘
Э ACL 802.1x ¶ ˘ IP ˘
Э IP

ð Ô

Ю ù gigabitethernet 1/1 '
00d0.f800.073c˘ ù è IP ' 192.168.12.202'

```
Ruijie# configure terminal
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# switchport mode access
Ruijie(config-if)# switchport port-security
Ruijie(config-if)# switchport port-security
mac-address 00d0.f800.073c ip-address 192.168.12.202
```

ð ¾Ô

¾	
show port-security	Â

ð Ù Ô

S8600 a IP˘ ж 1K' IP
ù 84

46.1.6 arp-check

ARP **no** Â ¾¶ ˘ default
Â

[**no | default**] [**auto**]**arp-check**

Ô

cpu ' CPU

auto :

Ô

ù ╠ Â

Ô

Â

ð Ô

Arp-check Ь ˘ ╟˘ Â ╟ Ю ↓
Э ˘ Arp Â Ю a arp Â
Ю Э Â

ð Ô

```
Ruijie(config-if)# arp-check
```

ð ३ Ô

३	
show port-security	Â

46.2

ЛЬЮ ३

- **show storm-control**
- **show port-security**

46.2.1 show storm-control

⁸ Â

show storm-control [*interface-id*]

ð Ô

	¸
interface-id	¸ ⁸ Â

ð Ô

ð ३ Ô

ð Ô

```
Ruijie# show storm-control gigabitethernet 1/1
Interface Broadcast Control Multicast Control Unicast
Control
------------------------------------ --------------
Gi1/1 Disabled Disabled Disabled
```

ð ३ Ô

¸ ¾	¸
storm-control	¸ 8 Â

46.2.2 show port-security

Â

show port-security [**address**] [**interface** *interface-id*]

ð Ô

address	˘ Â
interface *interface-id*	Â

ð ¾ Ô

ð Ô

¾ a ╗ ˘ à
˘ ┘ Â

ð 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
```

ð ¾ Ô

¾	
switchport port-security	╗ ˘ Â
switchport port-security aging	и Э Â
switchport port-security mac-address	Â

47 802.1X

47.1 dot1x

dot1x ў ╟ ৡ ЛЬЮ

- **dot1x auto-req**
- **dot1x auto-req packet-num**
- **dot1x auto-req req-interval**
- **dot1x auto-req user-detect**

47.1.1 dot1x auto-req

802.1X ў ╟ ╖ ˘ ৡ **dot1x auto-req** Â
ৡ **no** ↓ ў ╟ ╖ Â

[**no**] **dot1x auto-req**

ð Ô

a ў ╟

ð ৡ Ô

Â

ð Ô

ў ╟ 802.1x ˘ ↓Л **show dot1x auto-req**
ৡ ╖

ð Ô

Ю ў ╟ 802.1x '

```
Ruijie# configure terminal
Ruijie(config)# dot1x auto-req
Ruijie(config)# end
Ruijie(config)# show dot1x auto-req
Auto-Req: Enabled
User-Detect : Enabled
Packet-Num  : 0
Req-Interval: 30 Second
```

ð ৡ Ô

ৡ	

show dot1x auto-req	ў ╟

47.1.2 dot1x auto-req packet-num

ў ╟ ˘ no ѝ

dot1x auto-req packet-num *num*

no dot1x auto-req packet-num

ð Ô

num ў ╟

ð Ô

num = 0;

ð ৡ Ô

Â

ð Ô

interval ў ╟ ˘ Æ s

ð Ô

30

ð ϡ Ô

Â

ð Ô

ў ╟ ˘ ┘ Л∪ **show dot1x auto-req**

ϡ ╖

ð Ô

Ю

ð Ô

ў ╠ ˇ ┘ Л Ъ **show dot1x auto-req**

ٹ ╥

ð Ô

Ю ў Э Л '

```
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
```

ð ٹ Ô

ٹ	
show dot1x auto-req	ў ╠

47.2 dot1x

dot1x Л ЪЮ ٹ

- **dot1x timeout quiet-period**
- **dot1x timeout re-authperiod**
- **dot1x timeout server-timeout**
- **dot1x timeout supp-timeout**
- **dot1x timeout tx-period**

47.2.1 dot1x timeout quiet-period

ٹ ^ ٹ ~ Л

^ ~ Â ٹ **no** и

dot1x timeout quiet-period *seconds*

no dot1x timeout quiet-period

ð Ô

seconds Л Â

0 65535 Â Æ s

ð Ô

10 Â

ð ৡ Ô

Â

ð Ô

ﾉ˘ a ˘ Â ﾍ ﾉ

show dot1x

seconds Â 0 65535 Â Æ s Â

ð Ô

3600

ð ৡ Ô

Â

ð Ô

ㄴЛ **show dot1x** ৡ 802.1x Â

ð Ô

Ю ѝ 1000s

```
Ruijie# configure terminal
Ruijie(config)# dot1x timeout re-authperiod 1000
Ruijie(config)# end
Ruijie# show dot1x
802.1X Status:       Enabled
Authentication Mode:  EAP-MD5
Authed User Number:   0
Re-authen Enabled:    Disabled
Re-authen Period:     1000 sec
Quiet Timer Period:   1000 sec
Tx Timer Period:      3 sec
Supplicant Timeout:   3 sec
Server Timeout:       5 sec
Re-authen Max:        3 times
Maximum Request:      3 times
Filter Non-RG Supp:   Disabled
Client Oline Probe:   Disabled
Eapol Tag Enable:     Disabled
Authorization Mode:   Group Server
```

ð ৡ Ô

ৡ	
show dot1x	802.1x

47.2.3 dot1x timeout server-timeout

ৡ Ь Â ৡ

no ѝ Â

dot1x timeout server-timeout *seconds*

ð Ô

seconds ┗ ˘ 0
65535 Â

ð Ô

5

ð ৡ Ô

Â

ð Ô

┘Л **show dot1x** ৡ 802.1x Â

ð Ô

Ю ┗ ѝ 10s

```
Ruijie# configure terminal
Ruijie(config)# dot1x timeout server-timeout 10
Ruijie(config)# end
Ruijie# show dot1x

802.1X Status:       Enabled
Authentication Mode:  EAP-MD5
Authed User Number:   0
Re-authen Enabled:    Disabled
Re-authen Period:     1000 sec
Quiet Timer Period:   1000 sec
Tx Timer Period:      3 sec
Supplicant Timeout:   3 sec
Server Timeout:       10 sec
Re-authen Max:        3 times
Maximum Request:      3 times
Filter Non-RG Supp:   Disabled
Client Oline Probe:   Disabled
Eapol Tag Enable:     Disabled
Authorization Mode:   Group Server
```

ð ৡ Ô

ৡ	
show dot1x	802.1x

47.2.4 dot1x timeout supp-timeout

ٶ Â ٶ no
ѝ Â

dot1x timeout supp-timeout *seconds*

no dot1x timeout supp-timeout

ð Ô

seconds' ˘ 0
65535 Â

ð Ô

3 Â

ð ٶ Ô

Â

ð Ô

ٸЛυ **show dot1x** ٶ 802.1x Â

ð Ô

Ю ѝ 10s'

```
Ruijie# configure terminal
Ruijie(config)# dot1x timeout supp-timeout 10
Ruijie(config)# end
Ruijie# show dot1x
802.1X Status:       Enabled
Authentication Mode:  EAP-MD5
Authed User Number:   0
Re-authen Enabled:    Disabled
Re-authen Period:     1000 sec
Quiet Timer Period:   1000 sec
Tx Timer Period:      3 sec
Supplicant Timeout:   10 sec
Server Timeout:       10 sec
Re-authen Max:        3 times
Maximum Request:      3 times
Filter Non-RG Supp:   Disabled
Client Oline Probe:   Disabled
Eapol Tag Enable:     Disabled
Authorization Mode:   Group Server
```

ð ٶ Ô

ٶ	
show dot1x	802.1x

47.2.5 dot1x timeout tx-period

É Â Ḥ

```
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
```

ð ৡ Ô

ৡ	
show dot1x	802.1x

47.3.2 dot1x reauth-max

ৡ Â ৡ **no**
Â

dot1x reauth-max *count*

no dot1x reauth-max

ð Ô

count Â

ð Ô

ы 3

ð ৡ Ô

Â

ð Ô

ৡ˘ ⅃Л Â⅃Л
show dot1x ৡ 802.1x Â

ð Ô

Ю ℸ '

```
Ruijie# configure terminal
Ruijie(config)# dot1x reauth-max 5
Ruijie(config)# end
Ruijie# show dot1x

802.1X Status:       Enabled
Authentication Mode:  EAP-MD5
Authed User Number:   0
```

```
Re-authen Enabled:    Enabled
Re-authen Period:     1000 sec
Quiet Timer Period:   1000 sec
Tx Timer Period:      10 sec
Supplicant Timeout:   10 sec
Server Timeout:       10 sec
Re-authen Max:        5 times
Maximum Request:      3 times
Filter Non-RG Supp:   Disabled
Client Oline Probe:   Disabled
Eapol Tag Enable:     Disabled
Authorization Mode:   Group Server
```

ð ٪ Ô

٪	
show dot1x	802.1x

47.4 dot1x

Ћ ЛЬЮ

¸ **dot1x probe-timer**

¸ **dot1x client-probe enable**

47.4.1 dot1x probe-timer

.

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

no dot1x probe-timer

ð Ô

no'

interval hello

alive'

interval'

ð Ô

Hello й 20

й 250

ð ٪ Ô

Â

ð Ô

˘ ˧ Л∪ **show dot1x** ֽ 802.1x

Â

ð Ô

hello й 30 , й 120 '

```
Ruijie# configure terminal
Ruijie(config)# dot1x probe-timer interval 30
Ruijie(config)# dot1x probe-timer alive 120
Ruijie(config)# end
Ruijie# show dot1x probe-timer
Hello Interval: 30 Seconds
Hello Alive: 120 Seconds
```

ð ֽ Ô

ֽ	
Show dot1x probe-timer	

```
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
```

ð ¢Ô

¢	
show dot1x	dot1x

47.5 dot1x

è dot1x ЛЬЮ ¢

- **dot1x authentication**
- **dot1x auth-address-table**
- **dot1x auth-mode**
- **dot1x default**
- **dot1x dynamic-vlan enable**
- **dot1x guest-vlan enable**
- **dot1x eapol-tag**
- **dot1x max-req**
- **dot1x private-supplicant-only**
- **dot1x port-control auto**
- **dot1x port-control-mode**
- **dot1x stationarity enable**

47.5.1 dot1x authentication

AAA ЮЎ AAA Ь ˘
¾ Â ¾ **no** Â

dot1x authentication {**default** | *list-name*}

no dot1x authentication {**default** | *list-name*}

ð Ô

mac-addr' ¬ Â

Interface' Ñ Â

ð Ô

¬ Â

ð ¾ Ô

Â

ð Ô

¬ 802.1X Â **show dot1x auth-address table** ¾ Â

ð Ô

Ю Э ╗ Â

```
Ruijie# configure terminal
Ruijie(config)# dot1x auth-address-table address
00d0f8000000 interface ehternet 1/1
Ruijie(config)# end
Ruijie#
```

ð ¾ Ô

¾	
show dot1x auth-address-table	802.1X Â

47.5.3 dot1x auth-fail max-attemp

VLAN Â

dot1x auth-fail max-attemp num

no dot1x auth-fail max-attemp

num	VLAN , 1-3

3

¾ Â

?Л? **show dot1x** ? Â

Ю VLAN '

```
Ruijie# configure terminal
Ruijie(config)# dot1x auth-fail max-attemp 5
Ruijie(config)# end
Ruijie#write
```

?

?	
show dot1x	802.1x Â

Л

?Л

Л	
-	-

47.5.4 dot1x auth-fail vlan

802.1x vlan Â

dot1x auth-fail vlan vid

no dot1x auth-fail vlan

vid	vlan vid

vlan

? Â

?Л? **show dot1x interface** ? Â

Ю 802.1x vlan '

```
Ruijie# configure terminal
Ruijie(config)# interface fa 0/1
Ruijie(config-if)# dot1x auth-fail vlan 2
Ruijie(config-if)# end
Ruijie#write
```

ৡ	
show dot1x interface	802.1x Â

⁄

⁄	
-	-

47.5.5 dot1x auth-mode

802.1x Â

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

no dot1x auth-mode

ð Ô

eap-md5' 802.1x EAP-MD5

chap' 802.1x CHAP

pap' 802.1x PAP

ð Ô

EAP-MD5

ð ৡ Ô

Â

ð Ô

⊣ Л∪ **show dot1x** ৡ 802.1x

ð Ô

Ю 802.1x '

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

ð ৡ Ô

ৡ	
show dot1x	802.1x Â

47.5.6 dot1x default

802.1x ᚋ Â

dot1x default

ð Ô

ৡ Â

ð ৡ Ô

Â

ð Ô

ৰ Ո **show dot1x** ৡ 802.1x Â

ð Ô

Ю 802.1x '

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

ð ৡ Ô

ৡ	
show dot1x	802.1x Â

47.5.7 dot1x dynamic-vlan enable

╟ vlan Â ৡ **no** ৰ Ո

Â

ৰ Ո

٫ Л Ъ **show dot1x dynamic-vlan** ٪ 802.1x Â

ð Ô

Ю 802.1x ╟ vlan '

```
Ruijie# configure terminal
Ruijie(config)# interface gigabitEthernet 4/5
Ruijie(config-if)# dot1x dynamic-vlan enable
Ruijie(config)# end
Ruijie#
```

ð ٪ Ô

٪	
show dot1x	802.1x Â

47.5.8 dot1x guest-vlan

guest vlan Â ٪ **no** ٫ Л Ъ Â

dot1x guest-vlan *vid*

no dot1x guest-vlan

ð Ô

٪ vid ˘ <1 - 4094>

ð Ô

и

ð ٪ Ô

ð Ô

1. guest vlan ╖ ˘ ″l **dot1x dynamic-vlan enable** ٪˘ guest vlan a Â
2. guest vlan ╖ ˘ a γ ˘ è ╟ ╕ vlan Â
3. ٫ Л Ъ **show running-config** ٪ 802.1x Â

ð Ô

Ю 802.1x guest vlan '

```
Ruijie# configure terminal
Ruijie(config)# interface gigabitEthernet 4/5
Ruijie(config-if)# dot1x guest-vlan 10
```

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

ð ৡ Ô

ৡ	
show running-config	802.1x Â

47.5.9 dot1x eapol-tag

EAPOL TAG ╗ Â

dot1x eapol-tag

no dot1x eapol-tag

ð Ô

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ð Ô

┘Л **show dot1x** ৡ 802.1x Â

ð Ô

Ю 802.1X tag '

```
Ruijie# configure terminal
Ruijie(config)# dot1x eapol-tag
Ruijie(config)# end
Ruijie#
```

ð ৡ Ô

ৡ	
show dot1x	802.1x Â

47.5.10 dot1x mac-auth-bypass

MAC Â

dot1x mac-auth-bypass

no dot1x mac-auth-bypass

٦ Â

ل ᒪᑌ **show run** ٦ 802.1x Â

Ю 802.1x MAC '

```
Ruijie# configure terminal
Ruijie(config)# interface fa 0/1
Ruijie(config-if)# dot1x mac-auth-bypass timeout-activity 3600
Ruijie(config-if)# end
Ruijie#write
```

٦

٦	
show dot1x port-control interface	802.1x Â

```
Ruijie(config-if)# dot1x mac-auth-bypass violation
Ruijie(config-if)# end
Ruijie#write
```

ৡ	
show dot1x port-control interface	802.1x Â

⁄	
-	-

47.5.13 dot1x max-req

DOT1X Ł ˘ DOT1X Ł ˘ DOT1X ¨Ą Ł Â ৡ Ł Â ৡ **no** Â

dot1x max-req *count*

no dot1x ma87x-req

ð Ô

count Â

ð Ô

ы 3 Â

ð ৡ Ô

Â

ð Ô

˩ Л∪ **show dot1x** ৡ 802.1x Â

ð Ô

Ю 802.1x 7 '

```
Ruijie# configure terminal
Ruijie(config)# dot1x max-req 7
Ruijie(config)# end
Ruijie#
```

ð ৡ Ô

ৡ	
show dot1x	802.1x Â

47.5.14 dot1x private-supplicant-only

˘ ৸ ˘ **no**
Â

dot1x private-supplicant-only

no dot1x private-supplicant-only

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৸Л **show dot1x private-supplicant-only** ৡ 802.1x Â

ð Ô

Ю ৸ '

```
Ruijie# configure t
Ruijie(config)# dot1x private-supplicant-only
Ruijie(config)# end
Ruijie#
```

ð ৡ Ô

ৡ	
show dot1x private-supplicant-only	Â

47.5.15 dot1x port-control auto

˘ ╗ Â ৡ **no**
Â

dot1x port-control auto

no dot1x port-control

ð Ô

٪ Â

ð Ô

a ╗ 802.1x Â

ð ٪ Ô

Â

ð Ô

┘Л **show dot1x** ٪ 802.1x Â

ð Ô

Ю 802.1x б '

```
Ruijie# configure terminal
Ruijie(config)# interface g0/1
Ruijie(config-if)# dot1x port-control auto
Ruijie(config-if)# end
Ruijie#
```

ð ٪ Ô

٪	
show dot1x	802.1x Â

47.5.16 dot1x port-control-mode

802.1x ⁸ Ю MAC ⁸ ˘ ┘
˘ è ┘
˘ ⁸ ˘
┘ ˘ Ю
Â ⁸ ˘ Ю ┘ ˘
┘ ˘ Â ⁸ Ю˘
┘ й ˘ è ˘ Ю
˘ Â ٪ Ю˘

dot1x port-control-mode {**mac-based** | {**port-based** [**single-host**]} }

no dot1x port-control-mode

ð Ô

mac-based ' mac 802.1X ⁸

port-based ' 802.1X ⁸

single-host ' 802.1x ⁸

ð Ô

ѝ mac-based ⁸

ð ٪ Ô

Â

ð Ô

ٸЛъ **show dot1x port-control** ٪ 802.1x Â

single-host 802.1x ⁸˘ **show dot1x port-control** Э ѝ port-based **show running-config** ѝ **dot1x port-control-mode port-based single-host** Â

single-host ٸ ˘ ╟ default-user-limit single-host Â single-host ٨˘ Ю default-user-limit single-host ˘ ٸ Э Â

ð Ô

Ю 802.1x б '

```
Ruijie(config)# interface g 0/1
Ruijie(config-if)# dot1x port-control auto
Ruijie(config-if)# dot1x port-control-mode
port-based
Ruijie(config-if)# end
Ruijie#
```

Ю 802.1x '

```
Ruijie(config)# interface g 0/1
Ruijie(config-if)# dot1x port-control auto
Ruijie(config-if)# dot1x port-control-mode
port-based single-host
Ruijie(config-if)# end
Ruijie#
```

ð ٪ Ô

port-based single-host

802.1x ¸ Ю˘ Ю˘ ╟ ┘Л

˘ Ю˘ и a ÿ 802.1X è

˘ ┘Л ЛЮ ٹ Â

dot1x stationarity enable

no dot1x stationarity enable

ð Ô

ð Ô

и ╟ ┘Л

ð ٹ Ô

Â

ð Ô

ٹ˘ Â

ð Ô

Ю 802.1x б '

```
Ruijie# configure terminal
Ruijie(config)# dot1x stationarity enable
Ruijie(config)# end
Ruijie#
```

ð ٹ Ô

47.5.18 dot1x redirect url

˘ 802.1x ╗ ^ ~ ˘

˘ URL

URL˘ Лhttp:// ˘ ' http://ruijie.net/web˘ ˘ ┤

http:// ˘ a https:// Â ┤ ˘ ˘

Л url url Â no ┘Л ٹ

url'

dot1x redirect url [url-string]

[no] dot1x redirect url

url-string	URL

1' ' ruijie.net/web'

```
Ruijie(config)# dot1x redirect url http://ruijie.net/web
```

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

1' TCP ѝ 8443'

```
Ruijie(config)#dot1x redirect for special tcp-destination port
8443
```

३	
dot1x redirect url	
dot1x redirect time-out	
dot1x redirect num for special source-ip	↲
show dot1x	dot1x

↲

३ ↲	Л	
	-	-

47.5.20 dot1x redirect time-out

(Æ'), ѝ 3 ' ↲ ѝ 1-10 Â

no ↲Л३ '

dot1x redirect time-out port *time-out-interval*

no dot1x redirect time-out port

time-out-interval	

3

३

1' ѝ 5 '

```
Ruijie(config)# dot1x redirect time-out 5
```

३	३	

dot1x redirect url й ˘ ip й ip
web

dot1x redirect time-out	
show dot1x	dot1x

Â

ð Ô

ÞO

```
Ruijie# show dot1x
802.1X Status:       Enabled
Authentication Mode:  EAP-MD5
Authed User Number:   0
Re-authen Enabled:    Disabled
Re-authen Period:     3600 sec
Quiet Timer Period:   10 sec
Tx Timer Period:      3 sec
Supplicant Timeout:   3 sec
Server Timeout:       5 sec
Re-authen Max:        3 times
Maximum Request:      3 times
dot1xmax-rl3
Filter Non-RG Supp:   Disabled
Client Oline Probe:   Disabled
Eapol Tag Enable:     Disabled
Authorization Mode:   Group Server
Ruijie#
```

ð ¾Ô

¾	
dot1x auth-mode	802.1x Â

dot1xre auh-max X

47.6.2 show dot1x auth-address-table

ৡ 802.1X Â

show dot1x auth-address-table [**address** *mac-addr*] [**interface** *interface-id*]

ð Ô

mac-addr' ┘

interface' /ì

ð Ô

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ð Ô

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```
Ruijie# show dot1x auth-address-table
interface:g3/1
------------------------------------
mac addr: 00D0.F800.0001
Ruijie#
```

ð ৡ Ô

ৡ	
dot1x auth-mode	802.1x Â
dot1x max-req	Â

dot1x timeout server-timeout	Ł Â
dot1x timeout supp-timeout	Â
dot1x timeout tx-period	˘ Â

47.6.3 show dot1x auto-req

ÿ ╟ 802.1x Â

show dot1x auto-req

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ð ¾ Ô

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ð Ô

Ю '

```
Ruijie# show dot1x auto-req
Auto-Req: Disabled
User-Detect : Enabled
Packet-Num  : 0
Req-Interval: 30 Seconds
Ruijie#
```

ð ¾Ô

¾	
dot1x auth-mode	802.1x 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	Ł Â
dot1x timeout supp-timeout	Â
dot1x timeout tx-period	˘ Â

47.6.4 show dot1x private-supplicant-only

╗ Â

show dot1x private-supplicant-only

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Â

ð Ô

Ю '

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

ð ৡ Ô

ৡ	
dot1x auth-mode	802.1x 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
dot1x timeout supp-timeout	Â
dot1x timeout tx-period	Â

47.6.5 show dot1x max-req

Â

show dot1x max-req

ð Ô

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Â

ð ¾ Ô

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Â

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ÞO '

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

ð ¾Ô

¾	
dot1x auth-mode	802.1x 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

dot1x timeout supp-timeout

¸ ¸	¸
¸ dot1x auth-mode	¸ 802.1x 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
¸ dot1x timeout supp-timeout	¸ Â
¸ dot1x timeout tx-period	¸ Â

47.6.7 show dot1x probe-timer

show dot1x probe-timer

ð ¸ Ô

Â

ð Ô

ð Ô

ÞO '

```
Ruijie# show dot1x probe-timer
Hello Interval: 20 Seconds
Hello Alive: 250 Seconds
Ruijie#
```

ð ¸Ô

¸	

dot1x auth-mode	802.1x 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
dot1x timeout supp-timeout	Â
dot1x timeout tx-period	˘ Â

47.6.8 show dot1x re-authentication

show dot1x re-authentication

ð ¾ Ô

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ð Ô

ð Ô

Ю '

```
Ruijie# show dot1x re-authentication
reauth-enabled: disabled
Ruijie#
```

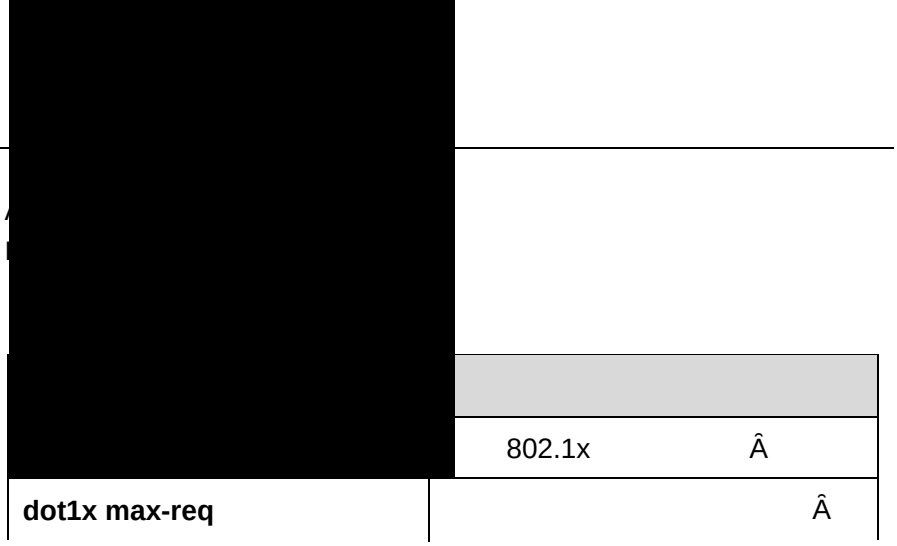
ð ¾Ô

¾	
dot1x auth-mode	802.1x Â

¸ dot1x max-req	¸ Â
¸ do dot1x port-control auto ¸	A'5B y ·hp›G¡ „AxA• õ ¶ ‚át–q @H ‡ ´z ¸D „ G ` .át–q @h Â ¸
¸ dot1x reauth-max	¸

802.1X ৡ

ð ৡ Ô



	802.1x Â
dot1x max-req	Â
dot1x port-control auto	╗ Â

```
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
```

ð ৡ Ô

ৡ	
dot1x auth-mode	802.1x 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
dot1x timeout supp-timeout	Â
dot1x timeout tx-period	˘ Â

47.6.12 show dot1x timeout

ৡ 802.1X

show dot1x timeout quiet-period

show dot1x timeout re-authperiod

show dot1x timeout server-timeout

show dot1x timeout supp-timeout

show dot1x timeout tx-period

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

ð ৡ Ô

ৡ	
dot1x auth-mode	802.1x 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
dot1x timeout supp-timeout	Â
dot1x timeout tx-period	˘ Â

48 AAA

48.1

- **aaa authentication dot1x**
- **aaa authentication enable**
- **aaa authentication login**
- **aaa authentication ppp**
- **login authentication**

48.1.1 aaa authentication dot1x

AAA 802.1X ˘ ¾ **aaa authentication dot1x** 802.1X Â ¾ no 802.1X Â

aaa authentication dot1x {**default** | *list-name*} *method1* [*method2*...]

no aaa authentication dot1x {**default**Ê

AAA 802.1X ¾ AAA 802.1X
Â **aaa authentication dot1x** ¾
¬ 802.1X Â

¬ ¬ ˘ ª Â

ð Ô

Ю Ня ª и rds_d1x AAA 802.1X Â
"I RADIUS ¾ ˘ RADIUS
¾ ¬ ˘ Â

```
Ruijie(config)# aaa authentication dot1x rds_d1x group
radius local
```

ð ¾ Ô

¾	
aaa new-model	AAA ¾
dot1x authentication	802.1X Э
username	Ня

48.1.2 aaa authentication enable

AAA Enable ˘ ¾ **aaa authentication enable** Enable Â ¾ no
Â

aaa authentication enable default *method1* [*method2*...]

no aaa authentication enable default

ð Ô

default ' ˘ ª Ня и Enable
Â Enable ˘ ¬
Â

method ' Ю ˘ 4 '

local	ª
none	a

¾ ˘ RADIUS
group

ð ¦ Ô

Â

ð Ô

AAA Enable ˇ AAA Enable
Â **aaa authentication enable** ¦
Enable Â

Â

Enable Enable Â

ð Ô

Ю AAA Enable Â ″I
RADIUS ˇ RADIUS
ˇ Â

```
Ruijie(config)# aaa authentication enable default group
radius local
```

ð ¦ Ô

¦	
aaa new-model	AAA
enable	
username	

48.1.3 aaa authentication login

AAA Login ˜ ˇ ¦ **aaa**
authentication login Login Â ¦ no
Â

aaa authentication login {**default** | *list-name*} *method1* [*method2*...]

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

ð Ô

default ' ˇ Login
Â

list-name ' Login ˇ Â

method ' Ю ˇ 4 '

local	¼
none	a
group	¦ ˘ RADIUS TACACS+ ¦

ð Ô

ð ¾ Ô

Â

ð Ô

AAA ¦˘ AAA Login
Â **aaa authentication login** ¾ ¬
Login Â

¬ ¬ ˘ ¼ Â

Login ¼˘ è Login
Э˘ a Â

ð Ô

Ю ⅋ ¼ и list-1 AAA Login Â
"I RADIUS ¦ ˘ RADIUS ¦
¬ ˘ Â

```
Ruijie(config)# aaa authentication login list-1 group
radius local
```

ð ¾ Ô

¾	
aaa new-model	AAA ¦
username **login authentication**	⅋ Э Login

48.1.4 aaa authentication ppp

AAA PPP ˘ ¾ **aaa authentication ppp** PPP Â ¾ no Â

aaa authentication ppp {**default** | *list-name*} *method1* [*method2*...]

no aaa authentication ppp {**default** | *list-name*}

ð Ô

default ' ˘ Л Ьѫ й PPP
Â

list-name ' Ьѫ PPP ˘ Л Л Â

method ' Ю ˘ 4 '

local	Л
none	a
group	Ь ˘ RADIUS Ь

ð Ô

ð ¾ Ô

Â

ð Ô

AAA PPP Ь˘ AAA PPP
Â **aaa authentication ppp** ¾ Л
PPP Â

Л Л ˘ Л Â

ð Ô

Ю Ьѫ Л й rds_ppp AAA PPP Â
"I RADIUS Ь ˘ RADIUS Ь
Л ˘ Â

```
Ruijie(config)# aaa authentication ppp rds_ppp group
radius local
```

ð ¾ Ô

¾	
aaa new-model	AAA Ь
ppp authentication	PPP
username	Ьѫ

48.1.5 login authentication

Э Login ~ ╖ ˘
Ю **login authentication** ¾ Login Â ¾
no Э Â

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

no login authentication

ð Ô

default ' ˘ Login Â

list-name ' Ю Login Â

ð Ô

ð ¾ Ô

Â

ð Ô

Login ˘ ╟ Э Â
Э Login ˘ ¼ ¾ Â
Ю ˘ ˘ Э Login
a ˘ Ю Login Â

ð Ô

Ю Ю ¼ ½ list-1 AAA Login Â
Â ¼ VTY 0 - 4 Э Â

```
Ruijie(config)# aaa authentication login list-1 local
Ruijie(config)# line vty 0 4
Ruijie(config-line)# login authentication list-1
```

ð ¾ Ô

¾	
aaa new-model	AAA ╘
username	Ю
login authentication	Login

48.2

- **aaa authorization commands**
- **aaa authorization config-commands**
- **aaa authorization console**
- **aaa authorization exec**
- **aaa authorization network**
- **authorization commands**
- **authorization exec**

48.2.1 aaa authorization commands

NAS CLI Э ˘ AAA ৡ ╖
ৡ ˘ ε ৡ Â
ৡ **aaa authorization commands** Â ৡ no
AAA ৡ ╖ Â

aaa authorization commands *level* {**default** | *list-name*} *method1* [*method2*...]

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

ð Ô

level ' ৡ ˘ 0~15˝ ᾱ ৡ
ﾉ Â

default ' ˘ ﾉ Ⱶ Ⴝ ৡ Â

list-name ' Ⱶ ৡ ˘ ﾚ Ⴎ Â

method ' Ю ˘ 4 '

none	a
group	Ⴌ ˘ TACACS+ Ⴌ

ð Ô

AAA ৡ ╖ Â

ð ৡ Ô

Â

ð Ô

ৡ ˘ AAA ৡ Ь Э˘ Ь
ৡ˘ ৡ ˘ ৡ a ˘ ৡ
Â

ৡ ৡ ˘ ৡ
ˆ ˘ ৡ 14 Л Э ˩ ˘ ৡ 14
˜ Â

ৡ ˩˘ è ৡ
Э˘ a Â

ð Ô

Ю TACACS+ Ь 15 ৡ '

```
Ruijie(config)# aaa authorization commands 15 default
group tacacs+
```

ð ৡ Ô

ৡ	
aaa new-model	AAA Ь
authorization commands	Э ৡ

48.2.2 aaa authorization config-commands

AAA ˆ è ˜ Ю ৡ
˘ ৡ **aaa authorization config-commands** Â
ৡ no AAA Ю ৡ ╖ Â

aaa authorization config-commands

no aaa authorization config-commands

ð Ô

ৡ Â

ð Ô

a Ю ৡ Â

ð ৡ Ô

Â

ð Ô

ৎ ˆ ˜ Ю ৡ ˇ ৲ Л৬ ৡ
no ╖ ˇ è Ю ৡ a
ৡ ৲ Л৬ Â

ð Ô

Ю Ю ৡ ╖ '

```
Ruijie(config)# aaa authorization config-commands
```

ð ৡ Ô

ৡ	
aaa new-model	AAA ┺
aaa authorization commands	ㄻ AAA ৡ

48.2.3 aaa authorization console

AAA ⁸ ৴ ˇ ৡ ˇ
ৡ **aaa authorization console** Â ৡ no AAA
⁸ ৴ ৡ ╖ Â

aaa authorization console

no aaa authorization console

ð Ô

ৡ Â

ð Ô

a ⁸ ৴ ৡ Â

ð ৡ Ô

Â

ð Ô

ᵂ ⁸ ৴ è ˇ ৲ Л৬ ⁸
৴ ˇ ৡ Â ⁸ ৴ ৡ ╖
ˇ ⁸ ৴ ৡ a Â

ð Ô

Ю ⁸ ৴ ৡ ╖ '

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

ð ৡ Ô

३

ð Ô

Ю RADIUS Ł Exec '

```
Ruijie(config)# aaa authorization exec default group
radius
```

ð ¾ Ô

¾	
aaa new-model	AAA Ł
authorization exec	Э
username	Ня

48.2.5 aaa authorization network

AAA Ł ^ PPP à SLIP ~ ˘ ¾ **aaa authorization network** Â ¾ no AAA ╖ Â

aaa authorization network {**default** | *list-name*} *method1* [*method2*...]

no aaa authorization network {**default** | *list-name*}

ð Ô

default ' ˘ Л Ня й Network Â

method ' Ю ˘ 4 '

none	a
group	Ł ˘ RADIUS Ł

ð Ô

¬ Л Ь a ¬ ˘ б ˘ ¬
¬ ˘ Л ˘ ˘
a Ё è Л Â

RADIUS ¦ Â
Л RADIUS RADIUS Э ˘ ¬ RADIUS
¬ ¬ RADIUS Â

ð Ô

Ю RADIUS ¦ ¦ '

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

ð ¦ Ô

¦	
aaa new-model	AAA ¦
aaa accounting	Н AAA
aaa authentication	Н AAA
username	Н

48.2.6 authorization commands

¦ Э˘ ¦
authorization commands Â ¦ no ¬ Э ¦ ╖ Â

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

no authorization commands *level*

ð Ô

level ' ¦ ˘ 0~15˝ ¤ ¦
Л Â

default ' ˘ ¦ Â

list-name ' Н ¦ Â

ð Ô

AAA ¦ ╖ Â

ð ¦ Ô

Â

ð Ô

¦ ˘ ╠ Э Â Э
¦ ˘ ↓ ¦ Â
Ж ˘ ˘ Э ¦ a
˘ Ж ¦ Â

ð Ô

Ю ↓ й cmd ¦ ˘ 15 ¦ ˘
TACACS+ й Ь ˘ Ь none Â
↓ VTY 0 – 4 Э'

```
Ruijie(config)# aaa authorization commands 15 cmd group
tacacs+ none
Ruijie(config)# line vty 0 4
Ruijie(config-line)# authorization commands 15 cmd
```

ð ¦ Ô

¦	
aaa new-model	AAA Ь
aaa authorization commands	Ж AAA ¦

48.2.7 authorization exec

Exec Э˘ ¦
authorization exec Â ¦ no ↓ Э Exec ╖ Â

authorization exec {**default** | *list-name*}

no authorization exec

ð Ô

default ' ˘ Exec Â

list-name ' Ж Exec Â

ð Ô

AAA Exec ╖ Â

ð ¦ Ô

Â

ð Ô

Exec ˘ ╠ Э Â
Э Exec ˘ ↓ ¦ Â

Ыж ˘ ˘ Э Exec
a ˘ Ыж Exec Â

ð Ô

Ю Л й exec-1 Exec ˘ RADIUS й
Ь ˘ Ь none Â Л VTY
0 – 4 Э'

```
Ruijie(config)# aaa authorization exec exec-1 group radius none
Ruijie(config)# line vty 0 4
Ruijie(config-line)# authorization exec exec-1
```

ð ٪ Ô

٪	
aaa new-model	AAA Ь
aaa authorization commands	Ыж AAA Exec

48.3

RADIUS ˘ ЛЬЮ ٪'

- **aaa accounting commands**
- **aaa accounting exec**
- **aaa accounting network**
- **aaa accounting update**
- **aaa accounting update periodic**
- **accounting commands**
- **accounting exec**

48.3.1 aaa accounting commands

╟˘ NAS Э ٪ ╟
˘ ٪ **aaa accounting commands** Â ٪ no
Л ٪ ╖ Â

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

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

╟˘ NAS ╟ ˘

٦ **aaa accounting exec** Â ٦ no ٧ Exec

╖ Â

¾	
aaa new-model	AAA ╘
aaa authentication	ЮЖ AAA
accounting commands	Э Exec

48.3.3 aaa accounting network

╟˘ ╟ ˘
¾ **aaa accounting network** Â ¾ no ↓
╖ Â

aaa accounting network {**default** | *list-name*} **start-stop group radius**

no aaa accounting network {**default** | *list-name*}

ð Ô

network ' ╘ ˘ DOT1X˘ PPP Â

resource ' Â

list-name ' ↓ Â

start-stop ' ╟ ˘
╖ ˘ Â

group ' ╘

radius ' RADIUS ╘

ð Ô

╖

ð ¾ Ô

Â

ð Ô

╘ ╟ Â
start-stop˘ ⁸ Â

ð Ô

ЮО RADIUS ╘ ˘
'

```
Ruijie(config)# aaa accounting network default
start-stop group radius
```

ð ¦Ô

¦	
aaa new-model	AAA L
aaa authorization network	H AAA
aaa authentication	H AAA
username	H

48.3.4 aaa accounting update

T ¦ **aaa accounting update**
¦ ¦ Â ¦ no
T Â

aaa accounting update

no aaa accounting update

ð Ô

ð Ô

T Â

ð ¦ Ô

Â

ð Ô

AAA L a Â AAA
L ¦ Â

ð Ô

HO Â

```
Ruijie(config)# aaa new-model
Ruijie(config)#
```

ð ¦Ô

¦	
aaa new-model	AAA L
aaa accounting network	H

48.3.5 aaa accounting update periodic

periodic ৡ˘ ৡ ৡ **aaa accounting update** Â ৡ no Â

aaa accounting update periodic *interval*

no aaa accounting update periodic

ð Ô

interval ' ˘ Л℧ ѝ Æ˘ ѝ 1↑ Â

ð Ô

5 minutes Â

ð ৡ Ô

Â

ð Ô

AAA Ь˘ a Â AAA Ь˘ ৡ Â

ð Ô

Ю 1↑ Â

```
Ruijie(config)# aaa new-model
Ruijie(config)# aaa accounting update
Ruijie(config)# aaa accounting update periodic 1
```

ð ৡ Ô

ৡ	
aaa new-model	AAA Ь
aaa accounting network	Ьѫ

48.3.6 accounting commands

ৡ Э˘ ৡ **accounting commands** Â ৡ no ৸ Э ৡ ℸ Â

accounting commands *level* {**default**

level ' 0~15 ā

default '

list-name '

ð Ô

ð Ô

ð Ô

ð Ô

Ю TACACS+ none VTY 0 – 4 Э'

```
Ruijie(config)# aaa accounting commands
```

list-name '

no aaa group server {**radius** | **tacacs+**} *name*

ð Ô

name ' Ł ¼ ¿˘ a ¾ ľ radius Ł˘ ľ tacacs+ Ł˘ ¾ RADIUS TACACS+ Ł ¿ Â

ð ¾ Ô

Â

ð Ô

¾ AAA Ł ˘ RADIUS TACACS+ Ł Â

ð Ô

Ю Â

```
Ruijie(config)# aaa group server radius ss
Ruijie(config-gs-radius)# end
Ruijie# show aaa group
Group Name:  ss
Group Type:  radius
Referred:    1
Server List:
```

ð ¾ Ô

¾	
show aaa group	aaa Ł

48.4.2 ip vrf forwarding

¾ AAA Ł vrf no Â

ip vrf forwarding *vrf-name*

no ip vrf forwarding

ð Ô

vrf-name ' vrf ¿

ð Ô

ð ¾ Ô

Ł Â

ð Ô

ѝ ┗ vrf Â

ð Ô

Ю Â

```
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
```

ð ৡ Ô

ৡ	
aaa group server	aaa ┗
show aaa group	aaa ┗

48.4.3 server

╗ AAA ┗ ┗ ˘ no Â

server *ip-address* [**auth-port** *port1*] [**acct-port** *port2*]

no server *ip-address* [**auth-port** *port1*] [**acct-port** *port2*]

ð Ô

ip-address ' ┗ ip

port1 ' ┗ ^ RADIUS ┗ ~

port2 ' ┗ ^ RADIUS ┗ ~

ð Ô

┗

ð ৡ Ô

┗ Â

ð Ô

┗ ╗ ┗ ˘ a Â

ð Ô

Ю Â

```
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 ¾Ô

¾	
aaa group server	aaa ¼
show aaa group	aaa ¼

48.4.4 show aaa group

AAA ¼ Â

show aaa group

ð Ô

```
Referred:    2
Server List:
IP Address: 192.168.217.64
Authentication Port: 1812
Accounting Port: 1813
Referred:  1
```

ð ¾Ô

¾	
aaa group server	AAA Ł

48.5 AAA

- **aaa local authentication attempts**
- **aaa local authentication lockout-time**
- **aaa new-model**
- **clear aaa local user lockout**
- **debug aaa**
- **show aaa method-list**
- **show aaa user lockout**

48.5.1 aaa local authentication attempts

login

aaa login authentication attempts c(shp)4(ticationed: 1 .12 ref 0 g BT/C

```
Ruijie# configure terminal
Ruijie(config)# aaa local authentication attempts 6
```

ð ¾Ô

¾	
show running-config	
show aaa lockout	login

48.5.2 aaa local authentication lockout-time

login ˘

aaa local authentication lockout-time *lockout-time*

ð Ô

lockout-time' ˆ Æ' ˜˜ ¼ 1~2147483647

ð Ô

ù 15

ð ¾ Ô

Â

ð Ô

login ˘

ð Ô

Ю '

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

ð ¾Ô

¾	
show running-config	
show aaa lockout	login

48.5.3 aaa new-model

AAA **aaa new-model**
AAA **no** AAA

aaa new-model

no aaa new-model

Â

Â

AAA

Â

AAA AAA
aaa new-model AAA AAA AAA
a Â

Ruijie(config)# **aaa new-model**

aaa authentication	
aaa authorization	
aaa accounting	

48.5.4 clear aaa local user lockou**t**

clear aaa local user lockout {**all** | **user-name** <*word*>}

<*word*>' ID

Â

ð Ô

˘ ⅃Ⲡ ≠ ⅃Ⲡ

ð Ô

Ю '

```
Ruijie# clear aaa local user lockout all
```

ð ৡ Ô

ৡ	
show running-config	
show aaa lockout	login

48.5.5 debug aaa

AAA ⊾ Â ৡ **no** Â

debug aaa event

no debug aaa event

ð Ô

Â

ð ৡ Ô

EXEC Â

48.5.6 show aaa method-list

AAA Â

show aaa method-list

ð Ô

ৡ Â

ð Ô

ð ৡ Ô

Â

ð Ô

¾ AAA Â

ð Ô

ÞO AAA Â

```
Ruijie# show aaa method-list
Authentication method-list
aaa authentication login default group radius
aaa authentication ppp default group radius
aaa authentication dot1x default group radius
aaa authentication dot1x san-f local  group angel group
rain none
aaa authentication enable default group radius
Accounting method-list
aaa accounting network default start-stop group radius
Authorization method-list
aaa authorizating network default group radius
```

ð ¾ Ô

¾	
aaa authentication	Hñ
aaa authorization	Hñ
aaa accounting	Hñ

48.5.7 show aaa user lockout

Â

show aaa user lockout {**all** | **user-name** <*word*>}

ð Ô

<*word*>' ID

ð Ô

ð ¾ Ô

Â

ð Ô

˘ Ju Â

ð Ô

ÞO '

```
Ruijie# show aaa user lockout all
```

ð ৡ Ô

ৡ	
show running-config	
show aaa lockout	login

49 RADIUS

49.1 RADIUS

RADIUS ЛЪЮ ٹ'

- **ip raiusradius source-interface**
- **radius-server attribute 31**
- **radius-server host**
- **radius-server key**
- **radius-server retransmit**
- **radius-server timeout**
- **radius-server dead-time**
- **radius attribute**
- **radius set qos cos**
- **radius vendor-specific extend**

49.1.1 ip radius source-interface

radius ˘ ٹ **ip radius source-interface** Â ٹ **no** RADIUS Â

ip radius source-interface *interface*

no radius source-interface

ð Ô

Interface' radius

ð Ô

radius Â

ð ٹ Ô

Â

ð Ô

ѝ radius Ь Э nas ˘ ٦ Л Ъ ٹ radius Â ٹ ip ѝ radius ˘ ٹ Ь Â

ð Ô

Ю radius ÿ fastEthernet 0/0 ٧ ip ѝ radius '

```
Ruijie(config)# ip radius source-interface
fastEthernet 0/0
```

ð ٪ Ô

٪	
radius-server host	Ѭ RADIUS Ł
ip address	ip

49.1.2 radius-server attribute 31

RADIUS Calling-Station-ID ˆ MAC˜ ˘ ٪ **radius-server attribute 31** Â ٪ **no** ѝ Â

radius-server attribute 31 mac format {**ietf** | **normal** | **unformatted**}

no radius-server attribute 31 mac format

ð Ô

ietf: ETF˜ RFC3580˜ ˘ ¦ - Ľ ѝ† Â ' 00-D0-F8-33-22-AC Â

normal: MAC ˆ † Ω ¤ ˜ ˘ ¦ . Ľ ѝ† Â ' 00d0.f833.22ac Â

unformatted: ˘ † ˘ Â '

00d0f83322ac Â

ð Ô

unformatted Â

ð ٪ Ô

Â

ð Ô

† RADIUS Ł ˆ ў 802.1x ˜ ٦ ٧ IETF ˘ Ю Calling-Station-ID ѝ

ð ¾Ô

¾	
radius-server host	Ю RADIUS Ь

49.1.3 radius-server host

RADIUS Ь ў ˘ ¾ **radius-server** Â ¾ **no** RADIUS Ь ў Â

radius-server host *ip-address* [**auth-port** *port-number*] [**acct-port** *port-number*]

no radius-server host *ip-address*

ð Ô

ip-address' RADIUS Ь ў IP Â

auth-port' RADIUS UDP

port-number' RADIUS UDP Л˘ и 0˝ ў a Â

acct-port' Radius UDP

port-number' RADIUS UDP Л˘ и 0˝ ў a Â

ð Ô

RADIUS ў Â

ð ¾ Ô

Â

ð Ô

и RADIUS AAA Ь˘ Ю RADIUS Ь Â ┘Л **radius-server** ¾ Ю RADIUS Ь Â

ð Ô

Ю Ю RADIUS Ь ў '

```
Ruijie(config)# radius-server host 192.168.12.1
```

ð ¾Ô

¾	
aaa authentication	Ю AAA

radius-server key	⊮ RADIUS ⊾ ৡ
radius-server retransmit	⊮ RADIUS
radius-server timeout	⊮ RADIUS

49.1.4 radius-server key

⊮ ⊾ ^ ~ б RADIUS ⊾
ৡ˘ ৡ **radius-server key** Â ৡ no
↓ ৡ Â

radius-server key [**0 | 7**] *text-string*

no radius-server key

ð Ô

text-string ৡ

0 | ***7*** ' ৡ ╗ ˘ 0 ╗ ˘ 7 ╗ Â

ð Ô

ৡ Â

ð ৡ Ô

Â

ð Ô

ৡ RADIUS

„ ¸ · 9 • E Ð Ô T " S Ï o n

ѝ RADIUS Ь ѵ Л ˘
ֽ **radius-server retransmit** Â ֽ **no**
Â

radius-server retransmit *retries*

no radius-server retransmit

ð Ô

retries' RADIUS Â

ð Ô

ѝ 3 Â

ð ֽ Ô

Â

ð Ô

AAA Ю Ь
ѵ Â Ь ѵ Ь
RADIUS ˘ Â

ð Ô

Ю ѝ 4'

```
Ruijie(config)# radius-server retransmit 4
```

ð ֽ Ô

ֽ	
radius-server host	Ѭ RADIUS Ь ў
radius-server key	Ѭ RADIUS ֽ
radius-server timeout	Ѭ RADIUS

49.1.6 radius-server timeout

RADIUS Ь ˘
ֽ **radius-server timeout** Â ֽ **no** ˘ Â

radius-server timeout *seconds*

no radius-server timeout

ð Ô

seconds ' ˆ Æ ѝ ˜ Â ѵ ѝ 1-1000 Â

ð Ô

5

ð ৡ Ô

Â

ð Ô

ৡ Â

ð Ô

Ю Ьѫ ѝ 10 '

```
Ruijie(config)# radius-server timeout 10
```

ð ৡ Ô

ৡ	
radius-server host	Ьѫ RADIUS Ь ў
radius-server retransmit	Ьѫ RADIUS
radius-server key	Ьѫ RADIUS ৡ

49.1.7 radius-server deadtime

ʌˇ t ˇ ѝ Ь ˇ
t ѝ ˆ deadtime˜ ˇ RGOS RADIUS
ˇ ৡ **radius-server deadtime** Â ৡ
no ˇ Â

radius-server deadtime *minnutes*
no radius-server deadtime

ð Ô

minnutes ˆ Æ ѝ¦ ˜ Â ˩ ѝ 1-1000 Â

ð Ô

5¦

ð ৡ Ô

Â

ð Ô

ৡ Â

ð Ô

Ю Ьѫ ѝ 10¦ '

12	file-name-1	12
13	file-name-2	13
14	file-name-3	14
15	file-name-4	15
16	max up-rate	16
17	version to server	17
18	flux-max-high32	18
19	flux-max-low32	19
20	proxy-avoid	20
21	dailup-avoid	21
22	ip privilige	22
23	login privilige	42

id	¶	type
1	max down-rate	76
2	qos	77
3	user ip	3
4	vlan id	4
5	version to client	5
6	net ip	6
7	user name	7
8	password	8
9	file-diractory	9
10	file-count	10
11	file-name-0	11
12	file-name-1	12
13	file-name-2	13
14	file-name-3	14
15	file-name-4	15

16	max up-rate	75
17	version to server	17

Â

ð Ô

ٹ˘ ٦Л Ю qos ий cos ˘ ий dscp

ð Ô

Ю '

```
Ruijie(config)# radius set qos cos
```

ð ٹ Ô

ٹ	
radius vendor-specific extend	Radius ий a Ш id

49.1.10 radius vendor-specific extend

ий a Ш id Â

radius vendor-specific extend

no radius vendor-specific extend

ð Ô

ð Ô

٦ id

ð ٹ Ô

Â

ð Ô

ٹ ٦ id Â

ð Ô

Ю '

```
Ruijie(config)# radius vendor-specific extend
```

ð ٹ Ô

ٹ	
radius attribute	Л
radius set	qos cos

49.2 RADIUS

- **debug radius** [**event | detail**]
- **show radius server**
- **show radius parameter**
- **show radius vendor-specific**

49.2.1 debug radius

RADIUS Â ¯Ì no RADIUS Â

debug radius {**event | detail**}

no debug radius {**event | detail**}

ð Ô

Â

ð ¯Ì Ô

EXEC Â

49.2.2 show radius server

RADIUS ¼ Â

show radius server

ð Ô

Â

ð Ô

ð ¯Ì Ô

Â

ð Ô

¯Ì radius ¼ Â

ð Ô

```
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
```

ð ¢Ô

¢	
radius-server host	ÞRADIUS ¦ ÿ
radius-server retransmit	ÞRADIUS
radius-server key	ÞRADIUS ¢
radius-server timeout	ÞRADIUS

49.2.3 show radius parameter

RADIUS ¦ Â

show radius parameter

ð Ô

ð Ô

ð ¢ Ô

Â

ð Ô

¢ radius ¦ Â

ð Ô

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

ð ¢Ô

¢	

radius-server host	ÎÆRADIUS ¸ ÿ
radius-server retransmit	ÎÆ RADIUS
radius-server key	ÎÆ RADIUS ¯
radius-server timeout	ÎÆ RADIUS

49.2.4 show radius vendor-specific

RADIUS Â

show radius vendor-specific

ð Ô

Â

ð Ô

ð ¯ Ô

Â

ð Ô

¯ radius

ð Ô

```
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    file-count             10
11    file-name-0            11
12    file-name-1            12
13    file-name-2            13
14    file-name-3            14
15    file-name-4            15
16    max up-rate            75
```

```
17   version to server     17
18   flux-max-high32       18
19   flux-max-low32        19
20   proxy-avoid           20
21   dailup-avoid          21
22   ip privilige          22
23   login privilige       42
24   limit to user number  50
```

ð ৡ Ô

ৡ	
radius-server host	ᵻ RADIUS ᵸ ў
radius-server retransmit	ᵻ RADIUS
radius-server key	ᵻ RADIUS ৡ
radius-server timeout	ᵻ RADIUS

50 TACACS+

50.1 TACACS+

TACACS+ ЛЬЮ ३'

- **aaa group server tacacs+**
- **server**(**TACACS+**)
- **ip vrf forwarding**(**TACACS+**)
- **ip tacacs source-interface**
- **tacacs-server host**
- **tacacs-server key**
- **tacacs-server timeout**

50.1.1 aaa group server tacacs+

३ TACACS+ Ь ˘ a ⊿ TACACS+ Ь ↑ a ⊿ Â

aaa group server tacacs+ *group-name*

no aaa group server tacacs+ *group-name*

50.1.3 ip vrf forwarding(TACACS+)

¾ TACACS+ ¦ vrf ¿ (VRF ¾) Â

ip vrf forwarding *vrf-name*

no ip vrf forwarding

ð Ô

vrf-name' vrf ¿

ð Ô

ð ¾ Ô

TACACS+ ¦ Â

ð Ô

ý TACACS+ ¦ vrf ¿ Â

ð Ô

Ю ý TACACS+ ¦ VRF ¿ ý vpn1'

```
Ruijie(config)# aaa group server tacacs+ tac1
Ruijie(config-gs-radius)# server 1.1.1.1
Ruijie(config-gs-radius)# ip vrf forwarding vpn1
```

ð ¾ Ô

¾	
aaa group server tacacs+	TACACS+ ¦
server	TACACS+ ¦ server

50.1.4 ip tacacs source-interface

¾ TACACS+ Â

ip tacacs source-interface *interface*

no ip tacacs source-interface

ð Ô

Interface' TACACS+

ð Ô

TACACS+ Â

ð ٦ Ô ŏ ѡ ò Hx TACACS+ Ł Â ð Ô ŏ ѡ ò ѝ Ł Э

ip address	ip

50.1.5 tacacs-server host

٦ TACACS+ Ł ў IP Â

tacacs-server host

ѝ TACACS+ AAA Ꮭ˘ ᏂҠ TACACS+ Ꮭ
Â

ð ҃ Ô

҃	
tacacs-server host	⌧ TACACS+ Ł ў
tacacs-server timeout	⌧ TACACS+

50.1.7 tacacs-server timeout

҃ б TACACS+ Ł ˘ Ł Â

tacacs-server timeout *seconds*

no tacacs-server timeout

ð Ô

seconds ' ˆ Æ и ˜ Â ˩ и 1-1000 Â

ð Ô

5

ð ҃ Ô

Â

ð Ô

EÝNM 6˜AÄE¡µ›Â ðåÄÖáð ðÃ5@Å`‘µ´5‘¼† B Â Rd5

50.2.1 debug tacacs+

TACACS+ Â ৡ no TACACS+ Â

debug tacacs+

no debug tacacs+

51 SSH

51.1 SSH

SSH ЛЪЮ ϡ'

- **crypto key generate**
- **crypto key zeroize**
- **ip ssh version**
- **ip ssh time-out**
- **ip ssh authentication-retries**

51.1.1 crypto key generate

Ь Ὼ ˘ Ю˘ ϡ'

crypto key generate {**rsa | dsa**}

ð Ô

rsa	RSA
dsa	DSA

ð Ô

Ю SSH Server Ὼ Â

ð ϡ Ô

ð Ô

SSH Server Ь ˘ ϡ SSH Ь Ὼ Â ⅄ **enable service ssh-server** ϡ˘ SSH Server ℸ Â SSH 1 RSA ' SSH 2 RSA DSA Â ˘ RSA ˘ SSH1 б SSH2 ⅄ Л Ъ ' DSA ˘ SSH2 ⅄ Л Ъ Â

~

˘ a ¾ **no crypto key generate˘** ¾ **crypto key zeroize** ¾ Â

ð Ô

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

ð ¾ Ô

¾	

show ip ssh

cry92(p36(to k(y)32 zeeroiz( )]TJC2_0 1 Tf0 Tc 0 Tw 10.5 0 0 10 [573.88401..3603 Tm[7F44C343]TJ/TT0 1 Tf-0.0162 Tc 2.251 0 Td((SSH)Tj/C2_0 1 Tf0 Tc 2.089 0 Td[1CE516[6750C3C30C32C58[70[758119A4A7902CC0CFC73C1214472135421FF514E303DF902C183B3E406[A5

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

ð ৡ Ô

ৡ

```
Ruijie# configure terminal
Ruijie(config)# ip ssh version 2
```

ð ֳ Ô

ֳ	
show ip ssh	SSH Server Â

ð Ô

˚ RGOS10.1 Л Э

51.1.4 ip ssh time-out

SSH Server Â ֳ **no**
ù Â

ip ssh time-out *time*

no ip ssh time-out

ð Ô

time	Â

show ip ssh	ssh-server	Â

ð Ô

˚ RGOS10.1 ЛЬЭ

51.1.5 ip ssh authentication-retries

SSH Server

51.2 SSH

SSH ЛЬЮ ৡ'

- **show ip ssh**
- **show ssh**
-

˚ RGOS10.1 Л Э

51.2.2 show ssh

SSH Â

show ssh

ð Ô

ð Ô

ð ৡ Ô

ð Ô

SSH Â ' ´ VTY Л à
SSH à ╗ à à à ⅄ Â

ð Ô

```
Ruijie# show ssh
```

ð ৡ Ô

ð Ô

˚ RGOS10.1 Л Э

51.2.3 show crypto key mypubkey

SSH Server Ὼ Ὼ ⍞ Â

show crypto key mypubkey {***rsa*|*dsa***}

ð Ô

ð ¾ Ô

ð Ô

SSH Server Ù Ù ¦ Â '
à ¸ à Ù ¦ Â

ð Ô

```
Ruijie# show crypto key mypubkey rsa
```

ð ¾ Ô

¾	
crypto key generate {**rsa	dsa**}	DSA б RSA Â

ð Ô

˚ RGOS10.1 Л Э

51.2.4 disconnect ssh

$ ¸ 20ÜWÛ12ª(AèêÜHQpç¸8(mprQ¼.ÿVqèÇMAc1M

ð ¾ Ô

¾	
show ssh	SSH Â
Clear line vty *line_number*	VTY Â

ð Ô

˚ RGOS10.1 Л Э

52 CPU

52.1

- **cpu-protect type** *packet-tpye* **pps** *pps_value*
- **cpu-protect type** *packet-tpye* **pri** *pri_value*

52.1.1 cpu-protect type packet-type pps pps_value

CPU

cpu-protect type { **arp** | **bpdu** | **dhcp** | **ipv6mc** |

ð Ô

pri_num ' ID˘ ↓ ½ 0˝ 7

ð Ô

½ 0Â

ð ¾ Ô

Â

ð Ô

Ю BPDU 7 '

```
Ruijie(config)# cpu-protect type bpdu pri 7
Set packet type bpdu pri 7.
```

ð ¾Ô

¾	
cpu-protect type packet-type pps *pps_value*	

52.2

CPU ¾ '

- **show cpu-protect mboard**
- **show cpu-protect slot** *slot-id*
- **show cpu-protect type** *packet-type*

52.2.1 show cpu-protect mboard

CPU Â

show cpu-protect mboard

ð ¾ Ô

Â

ð Ô

¾ CPU Â

ð Ô

Ю S9610 CPU Â

```
Ruijie# show cpu-protect mboard
Type        Pps      Total    Drop
```

```
------------ --------- --------- ---------
arp         500       19        0
bpdu        200       24        0
dhcp        0         0         0
gvrp        0         0         0
ipv6-mc     0         0         0
dvmrp       0         0         0
igmp        0         0         0
ospf        0         0         0
pim         0         0         0
rip         0         0         0
vrrp        0         0         0
unknow-ipmc  0         0         0
ttl1        0         0         0
...
```

ð ¾Ô

¾	
show cpu-protect slot *slot-num*	´ CPU

52.2.2 show cpu-protect slot

´ CPP Â

show cpu-protect slot *slot_num*

ð Ô

slot_num ' ¼ ý 1-16Â

ð ¾ Ô

Â

ð Ô

¾ ´ CPP Â

ð Ô

Ю ´ 2 CPU Â

```
Ruijie(config)# show cpu-protect slot 2
Type        Pps      Total    Drop
------------ --------- --------- ---------
arp         200      200       15
bpdu        200        8        0
dhcp        200        0        0
```

```
gvrp        200        0        0
ipv6-mc     200        0        0
dvmrp       200        0        0
igmp        200        0        0
ospf        200        0        0
pim         200        0        0
rip         200        0        0
vrrp        200        0        0
unknow-ipmc  200       0        0
ttl1         20        3        0
```

ð ¾ Ô

¾	
show cpu-protect mboard	CPU

52.2.3 show cpu-protect type

¾ '

show cpu-protect type { **arp** | **bpdu** | **dhcp** | **ipv6mc** | **igmp** | **rip** | **ospf** | **vrrp** | **pim** | **ttl1** | **unknown-ipmc** | **dvmrp** } *dvmrp*

ð ¾ Ô

Â

ð Ô

¾ Â

ð Ô

ЛЬЮ **show cpu-protect type bpdu** ¾ BPDU

'

```
Ruijie(config)# show cpu-protect type arp
Slot     Type        Pps      Total     Drop
-------- ------------ --------- --------- ---------
MainBoard bpdu         100        30        0
Slot-2    bpdu         100        30        0
```

ð ¾ Ô

¾	
show cpu-protect type *packet-type*	CPU

53

53.1

- **system-guard enable**
- **system-guard isolate-time** *seconds*
- **system-guard same-dest-ip-attack-packets** *number*
- **system-guard scan-dest-ip-attack-packets** *number*
- **system-guard detect-maxnum** *number*
- **system-guard exception-ip** *ip mask*
- **clear system-guard** [**interface** *interface-id* [**ip-address** *ip-address*]]

53.1.1 system-guard enable

no

system-guard enable

no system-guard enable

```
Ruijie(config-if)# system-guard  enable
```

```
Ruijie(config-if)# no system-guard  enable
```

system-guard same-dest-ip-attack-packets *number*

no system-guard same-dest-ip-attack-packets

ð Ô

number

number	IP Â ↓ ы 0 1000 ˘ ы 10 Â 0 a Â

ð Ô

ы 10

ð ϡ Ô

Â

ð Ô

˘ ў ↓ ˘

Э ў ˘

Â

ð Ô

Ю ы 100

```
Ruijie(config-if)# system-guard
scan-dest-ip-attack-packets 100
```

ð ϡ Ô

ϡ	
system-guard enable	╖

53.1.5 system-guard detect-maxnum number

ў Â ϡ **no** Â

system-guard detect-maxnum *number*

no system-guard detect-maxnum

ð Ô

number	IP Â ↓ ы 1 500 ˘ ы 100 Â 0 a Â

ð Ô

ы 100

ð ϡ Ô

Â

ð Ô

˘ ľ ў /20 Ł ┘ ┘ Â ˘
ў ў ˘ ┘Ц
ў ˘ Ц Â ˘
ў ˘ ў Â

ð Ô

Ю ў ѝ 200

```
Ruijie(config)# system-guard detect-maxnum 200
```

ð ϡ Ô

ϡ	
system-guard enable	╖

53.1.6 system-guard exception-ip ip mask

a IP Â ϡ **no** Â

system-guard exception-ip *ip mask*

no system-guard exception-ip *ip mask* [**all-eip**]

ð Ô

ip ┼ ⁸ ip

Ruijie(config)# **system-guard exception-ip** *192.168.5.145/24*

53.2.1 show system-guari2 418.62 0.72 refBT/TT1Qterface 1Qterface-id]

interface *interface-id*	

ð ϡ Ô

Â

ð Ô

ð Ô

```
Ruijie# show system-guard isolated-ip
interface   ip-address    isolate reason
remain-time(second)
----------  ------------------  ----------------
Fa 0/1    192.168.5.119   scan ip attack     110
Fa 0/1    192.168.5.109   same ip attack     61
```

ð ϡ Ô

ϡ	
system-guard enable	ℸ

53.2.3 show system-guard detect-ip [interface interface-id]

IP Â

show system-guard detect-ip [**interface** *interface-id*]

ð Ô

interface *interface-id*	

ð ϡ Ô

Â

ð Ô

ð Ô

```
Ruijie# show system-guard detect-ip
interface ip-address same ip attack packets  scan ip
attack packets
--------------------------------------------------
Fa 0/1    192.168.5.118        0             8
Fa 0/1    192.168.5.108       12             2
```

ð ϡ Ô

ϡ	

system-guard enable	

53.2.4 show system-guard exception-ip [interface interface-id]

IP

show system-guard exception-ip [**interface** *interface-id*]

interface *interface-id*	

```
Ruijie# show system-guard exception-ip
Exception IP Address    Exception Mask
--------------------      ---------------
255.255.255.0
192.168.4.11           255.255.255.0
```

system-guard enable	

54 DAI

54.1 VLAN DAI

३ '

¸ **ip arp inspection vlan**

54.1.1 ip arp inspection vlan vlan-id

३˘ ┘Л *vlan-id* VLAN DAI ╖ Â
३ no ┘Л *vlan-id* VLAN DAI ╖ ˘
*vlan-id*ď VLAN Э DAI ╖ Â

ip arp inspection vlan *vlan-id*

no ip arp inspection vlan [*vlan-id*]

ð Ô

vlan-id	vlan Л Â

ð Ô

VLAN Э DAI ╖ Â

ð ३ Ô

ð Ô

३ ˘ ″I DAI ╖ ˘ Э Â

ð Ô

ЛЪЮ ˘ и VLAN 1 Э ARP Â

```
Ruijie(config)# ip arp inspection
Ruijie(config)# ip arp inspection vlan 1
```

ð ३ Ô

३	
show ip arp inspection vlan	VLAN DAI ╖

54.2

54.2.1 ip arp inspection trust

γ ↵ ˘ ३ **ip arp inspection trust** Â ३ **no** γ ѝ a Â

ip arp inspection trust

no ip arp inspection trust

ð Ô

a Â

ð ३ Ô

Â

ð Ô

ARP ˚ DAI ˘ ↵ Л∪ è ↵ ˘ a ARP ˘ Â

ð Ô

ЛЬЮ ˘ gigabitEthernet 0/19 ↵ Â

```
Ruijie(config)# interface gigabitEthernet 0/19
Ruijie(config-if)# ip arp inspection trust
```

ð ३ Ô

३	
show ip arp inspection interface	DAI ˘ Â

NFPP( ) ˘ ⁸ NFPP ˘ a ¨Ą DAI ˘ Э ३ ↵ Â

54.3 DHCP Snooping

VLAN DAI ╖ ˘ з ARP γ a ↵ ˘ ARP ˘ DHCP Snooping . ˘ ÂDHCP Snooping ê DHCP Snooping Ì

55 IP Source Guard

55.1 IP Source Guard

IP Source Guard Ю ٦ Ю ٦

¸ **ip source binding**

55.1.1 ip source binding

˘ Ю ٦ Â ٦

ð ¢ Ô

¢	
show ip source binding	IP ˚

55.2 IP Source Guard

IP Source Guard ╖ ЮЎ Ю ¢

¸ **ip verify source**

55.2.1 ip verify source

Э IP Source Guard ╖ ˘ Ю
¢ Â ¢ **no** ˘ Э IP Source Guard ╖ Â

[**no**] **ip verify source** [**port-security**]

ð Ô

port-security ' IP Source Guard ╖ IP + MAC

ð Ô

ð ¢ Ô

ð Ô

¢˘ ┘Л IP Source Guard ╖ Â ┘Л
IP ˘ IP + MAC Â

╖ DHCP Snooping ⁸ Э ˘
Â

ð Ô

Ю **fastEthernet** *0/1* Э˘ IP Source Guard ╖ '

```
Ruijie#
```

```
FastEthernet            0/1  ip         active
192.168.4.243       00d0.f801.0101 1
```

ð ¾ Ô

¾	
show ip verify source	IP Source Guard

55.3 IP Source Guard

IP Source Guard è ¾ ЛьЮ '

- **show ip verify source**
- **show ip source binding**
- **debug ip source bind**

55.3.1 show ip verify source

ЮO ¾˘ ˩Л IP Source Guard Â

show ip verify source [**interface** *interface-id*]

ð Ô

interface-id '

ð ¾ Ô

ð Ô

IP Source Guard ╖ ˘ ЮO ' “IP source guard is not configured on the interface FastEthernet 0/10”

IP Source Guard ЮO'

inactive-no-snooping-vlan ' a DHCP Snooping ⁸ VLAN ˘ ╖ a '

inactive-trust-port ' DHCP Snooping ⁸ ˘ ╖ a '

active ' DHCP Snooping ⁸ ˘ ╖ Â

ð Ô

ЮO '

```
Ruijie # show ip verify source
```

```
Interface          Filter-type       Filter-mode
Ip-address Mac-address    VLAN
-------------------- ----------- -----------
FastEthernet 0/1   ip        active     192.168.4.243
00d0.f801.0101 1
```

ð ৡ Ô

ৡ	
ip verify source	IP Source Guard ╖

55.3.2 show ip source binding

Ю ৡ˘ ┘Л IP ˚ Â

show ip source binding [*ip-address*] [

ð ¾Ô

¾	
ip source binding	

55.3.3 debug ip source bind

Э IP Source Guard ╖ ˘ Ю ¾Â

debug ip source bind

ð Ô

ð Ô

ð ¾ Ô

ð Ô

¾˘ IP Source Guard ╖ Â

ð Ô

Ю IP Source Guard '

```
Ruijie# debug ip source bind
```

56 NFPP

56.1

NFPP ЛъЮ ¾'

- **cpu-protect sub-interface** {**manage|protocol|route**} **pps**
- **cpu-protect sub-interface** {**manage|protocol|route**} **percent**

ARP ЛъЮ ¾'

- **arp-guard isolate timeout**
- **arp-guard rate-limit**
- **arp-guard attack-threshold**
- **arp-guard scan-threshold**
- **clear arp-guard users**
- **clear arp-guard scan**

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

¾ Â

cpu-protect sub-interface {**manage** | **protocol** | **route**} **pps** *pps_vaule*

ð Ô

pps_vaule ' ˘ ¼ 1-8192

ð Ô

(manage) 3000˝ (route)
3000˝ (protocol) 3000 Â

ð ¾ Ô

ð Ô

```
Ruijie(config)# cpu-protect sub-interface manage pps 200
```

ð ¾ Ô

¾	

cpu-protect sub-interface {**manage | protocol | route**} **percent**	´ ă ʁ ŧ

56.1.2 cpu-protect sub-interface {manage|protocol|route} percent

¾ ´ ă ʁ ŧ Â

cpu-protect sub-interface {**manage** | **protocol** | **route**} **percent** *percent_vaule*

ð Ô

percent_vaule ' ŧ ˘ ˬ 1 100

ð Ô

(manage)´ ă ʁ ŧ ˡ 30˝ (route)´ ă ʁ ŧ ˡ 25˝ (protocol)´ ă ʁ ŧ ˡ 45 Â

ð ¾ Ô

ð Ô

ð Ô

```
Ruijie(config)# cpu-protect sub-interface manage percent 60
```

ð ¾ Ô

¾	
cpu-protect sub-interface {**manage | protocol | route**} **pps**	

56.1.3 arp-guard isolate timeout

¾ Â

arp-guard isolate timeout [*seconds* | **permanent**]

ð Ô

seconds ' ˘ Æ ˘ ˬ 0 [180, 86400]˝ 0 a

permanent ´

ð Ô

Ø a Â
˘ Â

ð ¾ Ô

ð Ô

ˆ
ˆ Â ˘ ˘ ¤
, ˘ Â

ð Ô

```
Ruijie(config)# arp-guard isolate timeout 180
Ruijie(config)# interface g 0/1
Ruijie(config-if)# arp-guard isolate timeout permanent
```

ð ¾Ô

¾	
show arp-guard configuration	

56.1.4 arp-guard rate-limit

Â

arp-guard rate-limit *pps* {**per-src-ip** | **per-src-mac** | **per-port**}

ð Ô

pps ´

per-src-ip ´ IP

per-src-mac ´ MAC

per-port ´

ð Ô

IP MAC 4 ˘
100 Â

ð ¾ Ô

ð Ô

ð Ô

```
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
```

ð ৡ Ô

ৡ	
show arp-guard configuration	

56.1.5 arp-guard attack-threshold

˘ ˘ ì ì Â

arp-guard attack-threshold

User<IP=N/A,MAC=0000.0000.0004,port=Gi4/1,VLAN=1> is isolated.

˚ ^ a ˚ a ~ ˘ T

RAP ╕ Ю '

Failed to isolate
user<IP=N/A,MAC=0000.0000.0004,port=Gi4/1,VLAN=1>.

ЛЪЮ '

1) ˚ 127 ˘ ˘
ㄴ ARP ˝ Â

2) ´ Э 1MB˘ Э ˘
ľ %ARPGUARD-4-MEM_LIMIT:user table's size reached limit 1MB. Ł
Â

3) ˘ ˚ ˘ ˚ ˘
˚ ˘ ľ %ARPGUARD-4-ISOLATE_FAILED:
failed to isolate ARP DoS attacker. Ł Â

4) ѝ ˇ ˘
ľ %ARPGUARD-4-NO_MEMORY: failed to alloc memory.. Ł
Â

5) CPU ˘ ˘ 30
Â TRAP Â

ð Ô

Ruijie(config)# **arp-guard attack-threshold** *2* **per-src-ip**

Ruijie(config)# **arp-guard attack-threshold** *3* **per-src-mac**

Ruijie(config)# **arp-guard attack-threshold** *50* **per-port**

ð ֳ Ô

ֳ	
show arp-guard configuration	
clear arp-guard users	
show arp-guard users	

56.1.6 arp-guard scan-threshold

Â

arp-guard scan-threshold pkt-cnt

ð Ô

pkt-cnt '

clear arp-guard users [**vlan** *vid*] [**interface** *interface-id*] [*ip-address* | *mac-address*]

ð Ô

vid ' /l

interface-id ' ¸

ip-address ' IP

mac-address ' MAC

ð ¾ Ô

ð Ô

a ˘ Â

ð Ô

VLAN 1 g 0/1 Â

```
Ruijie# clear arp-guard users vlan 1 interface g 0/1
```

ð ¾Ô

¾	
arp-guard attack-threshold	
show arp-guard users	

56.1.8 clear arp-guard scan

ARP Â

ð ৡ Ô

ৡ	
arp-guard scan-threshold	
show arp-guard scan	ARP

56.2

56.2.1 show arp-guard configuration

Â

show arp-guard configuration

ð Ô

ð ৡ Ô

ð Ô

ৡ ৲ Л℧ Â

ð Ô

```
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
```

ð ৡ Ô

ৡ	
arp-guard isolate timeout	
arp-guard rate-limit	
arp-guard attack-threshold	
arp-guard scan-threshold	

56.2.2 show arp-guard users

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

ð Ô

statistics ʻ

vid ʻ /l

interface-id ʻ ɻ

ip-address ʻ IP

¾	
arp-guard attack-threshold	
clear arp-guard users	

56.2.3 show arp-guard scan

ARP Â

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

ð Ô

statistics ' ARP

vid ′ /\

interface-id ′ ⅄

mac-address '

Ï – DAÈ â Ð

ð ३ Ô

३	
arp-guard scan-threshold	
clear arp-guard scan	ARP

57 ACL

ЛЬЮ ꝛ ⅃ ЛЬЮ ꝛ

	ⅈ
id	/ⅈ Â ⅃ IP ACL: 1-99,1300-1999 IP ACL: 100-199,2000-2699 MAC ACL: 700–799 ж ACL: 2700–2899
name	ACL ⅄
sn	ACL /ⅈ (ˮI)
start-sn	/ⅈ
inc-sn	/ⅈ
deny	ꟻ ˇ
permit	ꟻ ˇ
prot	/ⅈˇ IPv6 ⅃ и ipv6, icmp, tcp,udp 0-255˝ IPv4˝ ⅃ ЛЬ eigrp, gre, ipinip, igmp, nos, ospf, icmp, udp, tcp, ip ˇ ≠ ⅃ ЛЬ ꝛ IP 0-255 /ⅈˇ icmp/tcp/udp Ň

fragment	ʃ
precedence precedence	″I ˆ 0-7˜
time-range tm-rng-name	ѡ˘ ɻ ѝ tm-rng-name
tos tos	Ь ˆ 0-15˜
cos cos	cos (0-7)
cos inner cos	tag cos
icmp-type	ICMP ˆ 0-255˜
icmp-code	ICMP ʒ ˆ 0-255˜
icmp-message	ICMP ɻ
operator port[port]	Operator ѝ ˆ lt- ˘ eq- ˘ gt- ˘ neq- a ˘ range- ˜ port /ǀ˘ γ ч /ǀ ˘ ѐ ↓ /ǀ
src-mac-addr	ў
dst-mac-addr	ў
VID vid	vlan id
VID inner vid	tag vid
ethernet-type	ЛЪ ˘ ↓ЛЪ 0x
match-all tcpf	↑ tcp flag Æ
text	
in	
out	ÿ
{rule mask offset}+	rule Ѽ ⁸ ˘ mask Ѽ ⁸ offset ѝ ˘ ↓ “+” /ǀ

ЮЎ

AA AA AA AA AA AA BB BB BB BB BB BB CC CC DD DD
DD DD EE FF GG HH HH HH II II JJ KK LL LL MM MM
NN NN OO PP QQ QQ RR RR RR RR SS SS SS SS TT TT
UU UU VV VV VV VV WW WW WW WW XY ZZ aa aa bb bb

Ю

	ІѪ			ІѪ	
A	MAC	0	O	TTL	34
B	MAC	6	P	/ǀ	35

C		12	Q	IP	36
D	VLAN tag	14	R	ip	38
E	DSAP(┺)	18	S	ip	42
F	SSAP(┺)	19	T	TCP	46
G	Ctrl	20	U	TCP	48
H	Org Code	21	V	/I	50
I		24	W		54
J	IP /I	26	XY	IP Æ	58
K	TOS	27	Z	Æ flags Æ	59
L	IP	28	a	Windows size	60
M	ID /I	30	b	è	62
N	Flags	32			

Э ⌧ å ᵴ ᵀ

¾

- **ip access-group**
- **mac access-group**
- **expert access-group**
- **ipv6 traffic-filter**

57.1.1 access-list

¾ ˘ Â ¾ **no**

Â

1) IP ˆ 1 - 99˜ 1300 - 1999˜

access-list *id* {**deny**

destination-mac-address | **any**} [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**time-range** *time-range-name*]

Expert '

Internet Control Message Protocol (ICMP)

access-list *id* {**deny** | **permit**} **icmp** [**VID** [*out*][**inner** *in*]] {*source source-wildcard* | **host** *source* | **any**} {**host** *source-mac-address* | **any** } {*destination destination-wildcard* | **host** *destination* | **any**} {**host** *destination-mac-address* | **any**} [*icmp-type*] [[*icmp-type* [*icmp-code*]] | [*icmp-message*]] [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**time-range** *time-range-name*]

Transmission Control Protocol (TCP)

access-list *id* {**deny** | **permit**} **tcp** [**VID** [*out*][**inner** *in*]]{*source source-wildcard* | **host** *Source* | **any**} {**host** *source-mac-address* | **any** } [**operator** port [*port*]] {*destination destination-wildcard* | **host** *destination* | **any**} {**host** *destination-mac-address* | **any**} [**operator port** [*port*]] [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**time-range** *time-range-name*] [**match-all** *tcp-flag*]

User Datagram Protocol (UDP)

access-list *id* {**deny** | **permit**} **udp**[**VID** [*out*][**inner** *in*]] {*source source –wildcard* | **host** *source* | **any**} {**host** *source-mac-address* | **any** } [**operator port** [*port*]] {*destination destination-wildcard* | **host** *destination* | **any**}{**host** *destination-mac-address* | **any**} [**operator port** [*port*]] [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**time-range** *time-range-name*]

5)

access-list *list-remark text*

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ЛЬЮ Лb Л й ˘
˘ Л л a Ѧ Â

id ' Л Â Л ˆ 1-99˝ 100-199˝ 1300-1999˝ 2000-2699˝ 2700 – 2899˝ 700 - 799˜ Â

Deny ' ৭ ˘ ACE Â

Destination ' ^ ў ~

destination-wildcard

- **urg**
- **ack**
- **psh**
- **rst**
- **syn**
- **fin**

"I ⅃ HO'

- **critical**
- **flash**
- **flash-override**
- **immediate**
- **internet**
- **network**
- **priority**
- **routine**

⊨ ⅃ HO'

- **max-reliability**
- **max-throughput**
- **min-delay**
- **min-monetary-cost**
- **normal**

ICMP ⅃ HO'

- **administratively-prohibited**
- **dod-host-prohibited**
- **dod-net-prohibited**
- **echo**
- **echo-reply**
- **fragment-time-exceeded**
- **general-parameter-problem**
- **host-isolated**
- **host-precedence-unreachable**
- **host-redirect**
- **host-tos-redirect**
- **host-tos-unreachable**
- **host-unknown**
- **host-unreachable**
- **information-reply**

- **information-request**
- **mask-reply**
- **mask-request**
- **mobile-redirect**
- **net-redirect**
- **net-tos-redirect**
- **net-tos-unreachable**
- **net-unreachable**
- **network-unknown**
- **no-room-for-option**
- **option-missing**
- **packet-too-big**
- **parameter-problem**
- **port-unreachable**
- **precedence-unreachable**
- **protocol-unreachable**
- **redirect**
- **router-advertisement**
- **router-solicitation**
- **source-quench**
- **source-route-failed**
- **time-exceeded**
- **timestamp-reply**
- **timestamp-request**
- **ttl-exceeded**
- **unreachable**

Ю TCP ɻ ˇ TCP ˧ Л∪ ɻ Л ɛ

- **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**

Ю UDP ɻ ˇ UDP ㇵ Ո ɻ ʃ ɛ

- **biff**
- **bootpc**
- **bootps**
- **discard**
- **dnsix**
- **domain**
- **echo**
- **isakmp**
- **mobile-ip**
- **nameserver**
- **netbios-dgm**
- **netbios-ns**
- **netbios-ss**
- **ntp**

- **pim-auto-rp**
- **rip**
- **snmp**
- **snmptrap**
- **sunrpc**
- **syslog**
- **tacacs**
- **talk**
- **tftp**
- **time**
- **who**
- **xdmcp**

Ethernet-type

```
Ruijie(config)# access-list 102 permit tcp any any eq
domain
Ruijie(config)# access-list 102 permit udp any any eq
domain
Ruijie(config)# access-list 102 permit icmp any any echo
Ruijie(config)# access-list 102 permit icmp any any
echo-reply
```

3) MAC

Ю ˘ MAC й 00d0f8000c0c ў й 100 Лъ ˘ 1 Â '

```
Ruijie(config)# access-list 702 deny host 00d0f8000c0c
any aarp
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# mac access-group 702 in
```

4) Expert

Ю Expert Extended ACL˘ ж ACL IP й 192.168.12.3 з MAC й 00d0.f800.0044 TCP Â

```
Ruijie(config)# access-list 2702 deny tcp host
192.168.12.3 mac 00d0.f800.0044 any any
Ruijie(config)# access-list 2702 permit any any any any
Ruijie(config)# show access-lists
expert access-list extended 2702
10 deny tcp  host  192.168.12.3 mac 00d0.f800.0044 any
any
10 permit any any any any
```

ð ˛Ô

˛	
show access-lists	
mac access-group	Э MAC

ð ˙ Ô

˚ RGOS10.0 ЛъЭ

57.1.2 ip access-list

˛ IP ACL IP ACL˘ Â ˛ **no** ACL

ip access-list {**extended** | **standard**} {*id* | *name*}

no ip access-list {**extended** | **standard**} {*id* | *name*}

ð Ô

id IP /Ì˘ ^ 1-99˝ 1300-1999˜ ˘ ^ 100-199˝ 2000-2699˜

name ' IP ¸

ð Ô

ð ¾ Ô

ð Ô

ACL a ¸˘ ACL ╕ Â **deny permit** ¾ Â **show ip access-lists** ¾ ACL Â

ð Ô

ACL'

```
Ruijie(config)# ip access-list extended 123
Ruijie(config-ext-nacl)# show ip access-lists
ip access-list extended 123
Ruijie(config-ext-nacl)#
```

ACL'

```
Ruijie(config)# ip access-list standard std-acl
Ruijie(config-std-nacl)# show ip access-lists
ip access-list standard std-acl
Ruijie(config-std-nacl)#
```

ð ¾ Ô

¾	
show ip access-lists	IP

ð ¸ Ô

˚ RGOS10.0 Л Э

57.1.3 MAC access-list

¾ MAC ACL˘ Â ¾ **no** ACL

mac access-list extended {*id* | *name*}

no mac access-list extended {*id* | *name*}

ð Ô

Id′ MAC /ˆ 700-799˜

Name′ MAC ¸

ð Ô

ð ¾ Ô

ð Ô

¾ Â **show mac access-lists** ¾ ACL Â

ð Ô

MAC ACL'

```
Ruijie(config)# mac access-list extended mac-acl
Ruijie(config-mac-nacl)# show mac access-lists
mac access-list extended mac-acl
Ruijie(config-mac-nacl)#
```

MAC ACL'

```
Ruijie(config)# mac access-list extended 704
Ruijie(config-mac-nacl)# show mac access-lists
mac access-list extended 704
Ruijie(config-mac-nacl)#
```

ð ¾ Ô

¾	
show mac access-lists	mac

ð ¸ Ô

˚ RGOS10.0 Л Э

57.1.4 expert access-list

¾ ж ACL˘ Â ¾ **no** ACL

expert access-list extended {*id* | *name*}

no expert access-list extended {*id* | *name*}

ð Ô

Id ′ Expert /ˆ 2700-2899˜

Name ′ ACL ˛

ð Ô

ð ¾ Ô

ð Ô

¾ Â **show expert access-lists** ¾ ACL Â

ð Ô

ж ACL'

```
Ruijie(config)# expert access-list extended exp-acl
Ruijie(config-exp-nacl)# show expert access-lists
expert access-list extended exp-acl
Ruijie(config-exp-nacl)#
```

ж ACL'

```
Ruijie(config)# expert access-list extended 2704
Ruijie(config-exp-nacl)# show expert access-lists
expert access-list extended 2704
Ruijie(config-exp-nacl)#
```

ð ¾Ô

¾	
show expert access-lists	ж

ð ˛ Ô

˚ RGOS10.0 Л Э

57.1.5 ipv6 access-list

¾ IPV6 ACL˘ Â ¾ **no** ACL

ipv6 access-list *name*

no ipv6 access-list *name*

ð Ô

Name ' ACL ¸

ð ¾ Ô

ð Ô

¾ Â **show access-lists** ¾ ACL Â

ð Ô

IPV6 ACL'

```
Ruijie(config)# ipv6 access-list v6-acl
Ruijie(config-ipv6-nacl)# show access-lists
ipv6 access-list v6-acl
Ruijie(config-ipv6-nacl)#
```

ð ¾ Ô

¾	
show access-lists	IPV6

ð ¸ Ô

˚ RGOS10.0 Л Э

57.1.6 ip access-list resequence

¾ ip ACL ˘ IPV6 ACL˘
Â ¾ **no**

ip access-list resequence {*id* | *name*} **start-sn inc-sn**

no ip access-list resequence {*id* | *name*}

ð Ô

Id' ACL /

Name' ACL ¸

start-sn' /

ð Ô

¾ Â **show access-lists** ¾ ACL Â

ð Ô

ACL '

```
Ruijie# show access-lists
ip access-list standard 1
10 permit host 192.168.4.12
20 deny any any
Ruijie# config
Ruijie(config)# ip access-list resequence 1 21 43
Ruijie(config)# exit
Ruijie# show access-lists
ip access-list standard 1
21 permit host 192.168.4.12
64 deny any any
Ruijie#
```

ð ¾Ô

¾	
show access-lists	

ð Ô

˚ RGOS10.0 ЛЭ

57.1.7 deny

ACL0ÂACLA’5BÄ0 wy

[*sn*] **deny icmp** {*source source-wildcard* | **host** *source* | **any**} {*destination destination-wildcard* | **host** *destination* | **any**} [*icmp-type*] [[*icmp-type* [*icmp-code*]] | [*icmp-message*]] [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**time-range** *time-range-name*]

Transmission Control Protocol (TCP)

]

[*sn*] **deny tcp** {*source source-wildcard* | **host** *Source* | **any**} [*operator* **port** [*port*]] {*destination destination-wildcard* | **host** *destination* | **any**} [*operator* **port** [*port*]] [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**time-range** *time-range-name*] [**match-all** *tcp-flag*]

User Datagram Protocol (UDP)

[*sn* sourcangeildca–w0 1 T 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*]

ð Ô

ЛЪЮ **access-list**

Sn ′ ACL Л

source-ipv6-prefix ' IPv6 .

destination-ipv6-prefix ′ IPv6

prefix-length ′ Æ Æ

source-ipv6-address ′ IPv6

destination-ipv6-address ′ IPv6

dscp ' Ь

dscp ' ˘ 0-63.

flow-label '

flow-label ' ˘ 0-1048575.

protocol ' IPV6 Л й IPV6 | icmp | tcp | udp <0-255>

ð Ô

ð ʒ Ô

ACL Ю

ð Ô

ACL Ю ACL ˚

ð Ô

Ю Expert Extended ACL˘ ж ACL
IP й 192.168.4.12 з MAC й 001300498272
TCP Â

```
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)#
```

Ю IP ACL ˘ IP ѝ 192.168.4.12 ў TCP ѝ 100 Ь˘ 1Â

```
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)#
```

Ю MAC ACL ˘ MAC ѝ 0013.0049.8272 ў ѝ 100 Лu ˘ 1Â

```
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
```

Ю IP ACL ˘ IP ѝ 192.168.4.12 ў ˘ 1Â '

```
Ruijie(config)#
```

```
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# ipv6 traffic-filter v6-acl in
```

ð ¾Ô

¾	
show access-lists	
ipv6 traffic-filter	Э IPV6
ip access-group	IP ACL
mac access-group	MAC ACL
ip access-list	IP ACL Hx

[*icmp-type*] [[*icmp-type* [*icmp-code*]] | [*icmp-message*]] [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**time-range** *time-range-name*]

Transmission Control Protocol (TCP)

[*sn*] **permit tcp** {*source source-wildcard* | **host** *Source* | **any**} [*operator* **port** [*port*]] {*destination destination-wildcard* | **host** *destination* | **any**} [*operator* **port** [*port*]] [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**time-range** *time-range-name*] [**match-all** *tcp-flag*]

User Datagram Protocol (UDP)

[*sn*] **permit udp** {*source source -wildcard*|**host** *source* |**any**} [*operator* **port** [*port*]] {*destination destination-wildcard* |**host** *destination* | **any**} [**operator port** [*port*]] [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**time-range** *time-range-name*]

3) MAC

[*sn*] **permit** {**any** | **host** *source-mac-address*} {**any** | **host** *destination-mac-address*} [*ethernet-type*][**cos** [*out*] [**inner** *in*]]

4) Expert

[*sn*] **permit** [**protocol** | [*ethernet-type*][**cos** [*out*] [**inner** *in*]]] [**VID** [*out][***inner** *in]*] {*source source-wildcard* | **host** *source* | **any**} {**host** *source*-**mac**-*address* | **any** } {*destination destination-wildcard* | **host** *destination* | **any**} {**host** *destination-mac-address* | **any**} [**precedence** *precedence*] [**tos** *tos*][**fragments**] [**time-range** *time-range-name*]

Ethernet-type cos

[*sn*] **permit** {*ethernet-type*| **cos** [*out*] [**inner** *in*]} [**VID** [*out*][**inner** *in*]] {*source source-wildcard* | **host** *source* | **any**} {**host** *source-mac-address* | **any** } {*destination destination-wildcard* | **host** *destination* | **any**} {**host** *dTj/TT2 aC0.0001 l8 }]*[illegible]

destination-mac-address | **any**}[*icmp-type*] [[*icmp-type* [*icmp-code*]] | [*icmp-message*]] [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**time-range** *time-range-name*]

Transmission Control Protocol (TCP)

[*sn*] **permit tcp** [**VID** [*out*][**inner** *in*]]{*source source-wildcard* | **host** *Source* | **any**} {**host** *source-mac-address*

destination-ipv6-address | **any**} [*operator* **port** [**port**]] [**dscp**

```
Ruijie(config)# mac access-list extended 702
Ruijie(config-mac-nacl)# permit host 0013.0049.8272
any aarp
Ruijie(config-mac-nacl)# show access-lists
mac access-list extended
10 permit host 0013.0049.8272 any aarp702
Ruijie(config-mac-nacl)# exit
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# mac access-group 702 in
```

ÞO ip ACL ˘ IP

xpert access-list ж ACL ɔ Rs

ip access-list	IP ᅫ

ð ✓ Ô

˚ RGOS10.0 Л Э Â

57.1.10 remark

ACL ACE ╕ ˘ **no**

remark *text*

ð Ô

Text ˊ

ð ৡ Ô

ACL

ð Ô

и ACL ╕

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
```

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ৡ	
show access-lists	

57.1.11 no sn

ACL

no *sn*

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sn ' ¸ì ACL /¶

ð ¾ Ô

ACL Ю

ð Ô

ACL Ю ACL

ð Ô

```
Ruijie(config)# ipv6 access-list extended v6-acl
Ruijie(config-ipv6-nacl)# permit ipv6
host ::192.168.4.12 any
Ruijie(config-ipv6-nacl)# 12 deny ipv6 host any any
Ruijie(config-ipv6-nacl)# show access-lists
ipv6 access-list extended v6-acl
10 permit ipv6 host ::192.168.4.12 any
12 deny ipv6 any any
Ruijie(config-ipv6-nacl)# no 12
Ruijie(config-ipv6-nacl)# show access-lists
ipv6 access-list extended v6-acl
10 permit ipv6 host ::192.168.4.12 any
Ruijie(config-ipv6-nacl)#
```

ð ¾Ô

¾	
show access-lists	
ip access-list	ip ACL Ыж
ipv6 access-list	IPV6 ACL Ыж
deny	Ыж Ыж ACL
permit	Ыж Ыж ACL

ð ¸ Ô

RGOS10.0 Л Э

57.1.12 ip access-group

É ˘ ¾ **ip access-group** Â ¾ no ¼ Â

ip access-group {*id* | *name*} {**in** | **out**}

no ip access-group { *id* | *name*} {**in** | **out**}

ð Ô

id ' IP /ˆ 1-199˜ 1300-2699˜

name ' IP ¼

in '

out ' ÿ

ð Ô

ð ¾ Ô

ð Ô

ip access-group ¾ ˘ Â

ð Ô

Ю fastEthernet0/0 Э 120

'

```
Ruijie(config)# interface fastEthernet 0/0
Ruijie(config-if)#ip access-group 120 in
```

ð ¾ Ô

¾	
access-list	Н Â
show access-lists	
show ip access-list	IP ¦ ˆ 1-199˜ 1300 – 2699˜ 3000˙ 3199˜

ð ¼ Ô

˚ RGOS10.0 Л Э

57.1.13 MAC access-group

MAC ACL Â ¾ **no** ¼ Â

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

ð Ô

id ' MAC /\^ 700-799~
name ' MAC ¿
in '
out ' ÿ

ð Ô

ð ¾ Ô

ð Ô

ACL Â **show running-config** ¾ Â

ð Ô

Ю access-list accept_00d0f8xxxxxx_only Gigabit 1 Э'

```
Ruijie(config)# interface GigaEthernet 1/1
Ruijie(config-if)# mac access-group
accept_00d0f8xxxxxx_only in
```

ð ¾ Ô

¾	
show access-group	Э ACL Â

ð ¼ Ô

˚ RGOS10.0 Л Э

57.1.14 expert access-group

EXPERT ACL Â ¾ **no** ¼ Â

expert access-group {*id* | *name*} {**in** | **out**}
no expert access-group {*id* | *name*} {**in** | **out**}

ð Ô

id ' Expert /ˆ 2700-2899˜

name ' Expert ¿

in '

out ' ÿ

ð Ô

ð ¾ Ô

ð Ô

ACL Э˜ è ¸ Â

show access-group ¾

ð Ô

Ю access-list accept_00d0f8xxxxxx_only Gigabit 1 Э'

```
Ruijie(config)# interface GigaEthernet 0/1
Ruijie(config-if)# expert access-group
accept_00d0f8xxxxxx_only in
```

ð ¾Ô

¾	
show access-group	Э ACL Â

ð ¼ Ô

˚ RGOS10.0 Л Э

57.1.15 ipv6 traffic-filter

IPV6 ACL Â ¾ no ¼ Â

ipv6 traffic-filter *name* {**in** | **out**}

no ipv6 traffic-filter *name* {**in** | **out**}

ð Ô

name ' IPV6 ¿

in '

out ' ÿ

ð Ô

ð ¾ Ô

ð Ô

ACL Э˘ è ⁸ Â
show ipv6 traffic-filter ¾

ð Ô

Ю access-list v6-acl Gigabit 1 Э'

```
Ruijie(config)# interface GigaEthernet 0/1
Ruijie(config-if)# ipv6 traffic-filter v6-acl in
```

ð ¾Ô

¾	
show access-group	Э ACL Â

ð ⁄ Ô

˚ RGOS10.0 Лъ Э

57.2

б ЛъЮ ¾:

- **show access-lists**
- **show ip access-group**
- **show expert access-group**
- **show mac access-group**
- **show ipv6 traffic-filter**
- **show access-group**

57.2.1 show access-lists

ACL ⁄ ACL

show access-lists [*id* | *name*]

ð Ô

id ' /\

name ' ˙

ð ˝ Ô

ð Ô

acl˘ *id* *name*˘ ACL

ð Ô

```
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 ˝ Ô

˝	
ip access-list	IP ACL Ⱶ Â
mac access-list	MAC ACL Ⱶ
expert access-list	Expert ACL Ⱶ
ipv6 access-list	IPv6 ACL Ⱶ

ð ˙ Ô

˚ RGOS10.0 Л Э

57.2.2 show ip access-group

IP ACL

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

ð Ô

<*interface*> '

ð ˝ Ô

ð Ô

IP ACL˘ ˘ IP

ACL

ð Ô

```
Ruijie# show ip access-group interface gigabitethernet
0/1
ip access-group aaa in
Applied On interface GigabitEthernet 0/1.
```

ð ¾Ô

¾	
ip access-list	IP ACL Hπ Â

ð ⁄ Ô

˚ RGOS10.0 Л Э

57.2.3 show expert access-group

%9 4w ó9 Y5(

Ъ Л Э Ї%B

Expert Â **RGOS10.0** Л Э

˚ RGOS10.0 Л Э

57.2.4 show mac access-group

MAC

show mac access-group[**interface** <*interface*>]

ð Ô

<*interface*> '

ð ֽ Ô

ð Ô

MAC ACL˘ ˘
MAC ACL

ð Ô

```
Ruijie# show mac access-group interface gigabitethernet
0/3
mac access-group mm in
Applied On interface GigabitEthernet 0/3.
```

ð ֽ Ô

ֽ	
mac access-list	MAC ACL ⊮

ð ⊿ Ô

˚ RGOS10.0 Л Э

57.2.5 show ipv6 traffic-filter

IPV6

show ipv6 traffic-filter [**interface** <*interface*>]

ð Ô

<*interface*> '

ð ֽ Ô

ð Ô

IPv6 ACL˘ ˘ IPv6 ACL

ð Ô

```
Ruijie# show ipv6 traffic-filter interface
gigabitethernet 0/4
ipv6 traffic-filter v6 in
Applied On interface GigabitEthernet 0/4.
```

ð ¾Ô

¾	
ipv6 access-list	IPV6 ACL Ьж

ð ⁄ Ô

˚ RGOS10.0 Л Э

57.2.6 show access-group

Э ACL

show access-group [**interface** <*interface*>]

ð Ô

<*interface*> '

ð ¾ Ô

ð Ô

Э ACL˘ a Э ACL

ð Ô

```
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.
```

ð ¾Ô

ʒ	
ip access-group	ip ㄏ
mac access-group	MAC ㄏ
expert access-group	Expert ㄏ
ipv6 traffic-filter	IPV6 ㄏ

ð ⊿ Ô

˚ RGOS10.0 Л Э

57.3

б ЛЮ ʒ

ʒ

¸ **security global access-group**

ʒ

¸ **security access-group**

¸ **security uplink enable**

57.3.1 security global access-group

security global access-group {*id*|*name*}

no security global access-group

ð Ô

id ACL id

name ACL ⊿

ð ʒ Ô

ð Ô

ð Ô

```
Ruijie(config)#security global access-group 1
```

ð ʒ Ô

¾	
show secu-acl	

ð ¼ Ô

˚ RGOS10.2 Л Э

57.3.2 security access-group

security access-group {*id*|*name*}

no security access-group

ð Ô

id ' ACL id

name ' ACL ¼

ð ¾ Ô

ð Ô

Ю

ð Ô

```
Ruijie(config-if)#security access-group 1
```

ð ¾ Ô

¾	
show secu-acl	

ð ¼ Ô

˚ RGOS10.2 Л Э

57.3.3 security uplink enable

security uplink enable

no security uplink enable

ð Ô

ð ʒ Ô

ð Ô

ð Ô

```
Ruijie(config-if)#security uplink enable
```

ð ʒ Ô

ʒ	
show secu-acl	

ð ✓ Ô

˚ RGOS10.2 Л Э

58 VACL

58.1

Vlan access map ч ˘ è *map_name* ў a ⅃ ˘ *map_sn* ˘ ⅃Л Â ⅃ ⅃ mapˆ ˜ ɬ ў map Â

¸ **vlan access map** Э mapˇ a *map_sn* ˘ map з ⅃ ў map map *map_sn* Э╗ *10’*

¸ a *map_sn* ˘ **vlan access mapˇ** ⅃ *map_name* *Map_name* ˘ ў map ’

¸ map_sn ˘ **vlan access mapˇ** mapˈ map ў map a map ˘ ў map ╟ ˘ a ’

¸ ў map ⅃Л 6553 mapˈ

58.1.1 vlan access-map

mapˇ ʒ Â mapˇ ʒ no Â

vlan access-map *map_name* [*map_sn*]

no vlan access-map *map_name* [*map_sn*]

ð Ô

*map_name*ˈ map ў ˘ a 100 ˘ a ⅃ ’

map_sn’ map ˘ [0 - 65535]ˇ ⅃ ’

ð Ô

ð ʒ Ô

ð Ô

ð Ô

Ю **vlan access mapˈ**

```
Ruijie(config)# vlan access-map ddd 20
Ruijie(config-access-map)#
```

ð ৡ Ô

58.1.2 match ip/mac address

ip acl *mac acl* **vlan access map** Э˘ ৶
ip acl *mac acl* **vlan access map** Э ˘
ৡ no Â

match ip address { *acl_name* **|** *acl_id* }+
no match ip address { *acl_name* **|** *acl_id* }+
match mac address { *acl_name* **|** *acl_id* }+
no match mac address { *acl_name* **|** *acl_id* }+

~

\+ acl, 8 acl Â

ð Ô

acl_name' ৸ acl;

acl_id' numbered acl;

ð ৡ Ô

Config-access-map ˘ vacl

ð Ô

&

1) map ৶ ip acl map acl˝ ч ৶ è ˘ a ’
2) map ৶ 8 acl'
3) map a a acl'
4) map a ace acl˝ acl'
5) map ip acl (mac acl)˘ ¨Ą ip acl (mac acl)˘ ৸ ip acl (mac acl) ip acl (mac acl) ৸ ’
6) map ip acl (mac acl)˘ ¨Ą mac acl (ip acl)˘ ¨I ╟ ip acl (mac acl)˘ ৸ mac acl (ip acl)'

ð Ô

Ю ˘ map match '

```
Ruijie(config)# vlan access-map dd
Ruijie(config-access-map)# match ip address 10 20 sp1
30 sp2
Ruijie(config-access-map)# exit
Ruijie(config)# vlan access-map dd 20
Ruijie(config-access-map)# match mac address 710 720 m1
760
Ruijie(config-access-map)# exit
Ruijie(config)#
```

58.1.3 action forward/drop/redirect

map actions ╟ ˘ vacl ЮO ЮO ¾ Â ¾
no ↓ map actions ╟ ˘ ╟ forward Â

action forward
no action forward

map actions ╟ ˘ vacl ЮO ЮO ¾ Â ¾
no ↓ map actions ╟ ˘ ╟ forward Â

action drop
no action drop

map actions ╟ ˘ vacl ЮO ЮO ¾ Â ¾
no ↓ map actions ╟ ˘ ╟ forward Â

action redirect { **GigabitEthernet** | **Aggregateport** } {*port_id*}
no action redirect { **GigabitEthernet** | **Aggregateport** } {*port_id*}

ð Ô

action forward ¾ '

action drop ¾ '

action redirect '

ð Ô

map ╟ ˘ ╟ forward Â map ↓
╟ Â

ð ¾ Ô

vacl

ð Ô

```
Ruijie(config-access-map)# action forward
Ruijie(config-access-map)# action drop
Ruijie(config-access-map)# action redirect
gigabitEthernet 0/50
```

58.1.4 vlan filter

ў map vlan Э˘ ৡ Â ৸ ў map vlan Э ˘ ৡ no Â

vlan filter *map_name* **vlan-list** *vlan_id*
no vlan filter *map_name* **vlan-list** *vlan_id*

ð Ô

map_name ' ў map '

vlan_id ′ vlan id Â

ð ৡ Ô

ð Ô

```
Ruijie(config)# show vlan access-map
Vlan access-map aa  10
match mac address:   700, 710, m1, 720,
action: forward
Vlan access-map aa  20
match ip address:   10, 20, 30, sp1, sp2, 60, 50, 80,
action: drop
Vlan access-map dd  20
match mac address:   710, 720, m1, 760,
action: forward
Ruijie(config)#
```

Ю **show vlan access map** { *map_name* } '

```
Ruijie(config)# show vlan access-map dd
Vlan access-map dd  20
match mac address:   710, 720, m1, 760,
action: forward
Ruijie(config)#
```

58.2.2 show vlan filter

ў map vlan Э ˘ Ю ¸Â

show vlan filter

ð Ô

ð ¸ Ô

ð Ô

ð ¸Ô

¸	
Show vlan filter *access-map map_name*	ў map vlan Э

show vlan filter vlan *vlan>015.874 1.446 Td<1DB9233-2.86 Tw 8.5836-1.44 0 371DB92*

```
Configured on VLANs: 1,  5,  6,
Ruijie(config)#
```

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

DSCP to CoS

CoS

mls qos cos *default-cos*

no mls qos cos

ð Ô

default-cos′ ӄ 0˙ 7

no'

ð Ô

CoS ӄ 0

ð ৡ Ô

ð Ô

```
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# mls qos cos 7
```

ð ৡ Ô

show mls qos interface *interface-id*

59.2.3 Class Maps

ACL

ip access-list {**extended** | **standard**} { *acl-id* | *acl-name* }

mac access-list extended {*acl-id* | *acl-name*}

expert access-list extended {*acl-id* | *acl-name*}

ipv6 access-list extended *acl-name*

access-list acl-id ৡ˘ ACL

class map˘ class map

[**no**] **class-map** *class-map-name*

class map ה

[**no**] **match access-group** *acl-name*| *acl-id*

ð Ô

acl-name ' ACL ɻ

acl-id ' ACL id

class-map-name ' class map ɻ

no class-map *class-map-name* ' class map

no match access-group *acl-name*| *acl-id* ' ৭

ð ৡ Ô

ð Ô

MAC ACL, ৸ me

```
Ruijie(config)# mac access-list extended me
```

ACL

```
Ruijie(config-ext-macl)# permit host 1111.2222.3333
any
```

ACL

```
Ruijie(config-ext-macl)# exit
```

class-map, ৸ cm

```
Ruijie(config)# class-map cm
```

ACL

```
Ruijie(config-cmap)# match access-group me
```

class-map

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

ð ৡ Ô

show mac access-lists

show ip access-lists

show class-map

59.2.4 Policy Maps

policy map˘ policymap

[**no**] **policy-map** *policy-map-name*

policy map class-map ৻ , ৻

[**no**] **class** *class-map-name*

IP ipdscp ˘ IP a

set ip dscp *new-dscp*

no set ip dscp

8 ӥ ᛠ ╟

police *rate-bps burst-byte*[**exceed-action** {**drop | dscp** *dscp-value*}]

no police

ǒ Ô

policy-map-name ' policymap ⅄ '

no policy-map *policy-map-name* ' policy map'

class-map-name ' class map ⅄ '

no class *class-map-name* ' ᛠ '

new- ßyĴDaÊ0-ÐLq2ÊÉte-bOS×burst-byOSmap@ÃOS×drop Ödsclicymap drop 8ŷ

pol,icy map

policy map Э

service-policy {**input** | **output**} *policy-map-name*

no service-policy {**input** | **output**}

ð Ô

policy-map-name ' policymap ⁄

no ' policy map Э

ð ৡ Ô

ð Ô

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

ð ৡ Ô

show mls qos queueing

59.2.7 priority-queue cos-map

CoS

priority-queue cos-map *qid cos0* [*cos1* [*cos2* [*cos3* [*cos4* [*cos5* [*cos6* [*cos7*]]]]]]]

no priority-queue cos-map

ð Ô

qid ' ѝ id'

cos0 ... cos7 ' CoS '

no ' Â

ð Ô

ð ৡ Ô

ð Ô

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

ð ৡ Ô

show mls qos queueing

59.2.8 wrr-queue bandwidth

WRR

wrr-queue bandwidth *weight1 ... weightn*

no wrr-queue bandwidth

ð Ô

weight1...weightn ѝ n ˘ n ৸ ৯

no ' Â

ð Ô

weight1: ...: weightn = 1:...:1

ð ৡ Ô

ð Ô

```
Ruijie(config)# wrr-queue bandwidth 1 2 3 4 5 6 7 8
```

ð ৡ Ô

show mls qos queueing

59.2.9 mls qos map cos-dscp

CoS DSCP

mls qos map cos-dscp *dscp1...dscp8*

no mls qos map cos-dscp

ð Ô

dscp ' ৸ a ৶ a ৶

no '

ð Ô

ð ৡ Ô

ð Ô

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

ð ৡ Ô

show mls qos maps dscp-cos maps,dscp-cos maps ip-prec-dscp maps

59.2.10 mls qos map dscp-cos

DSCP CoS

mls qos map dscp-cos *dscp-list* to *cos*

no mls qos map dscp-cos

ð Ô

dscp-list ' ৸ a ৶ a ৶

cos ' ৶ 0˙ 7

no '

ð Ô

ð ৡ Ô

ð Ô

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

no mls qos scheduler

ð Ô

sp ' ˝l

rr '

wrr'

drr'

no'

ð Ô

ѝ wrr

ð ৡ Ô

ð Ô

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

ð ৡ Ô

show mls qos scheduler

59.2.13 drr-queue bandwidth

DRR

drr-queue bandwidth *weight1...weight8*

no drr-queue bandwidth

ð Ô

weight1...weight8 ' ↓

no '

ð Ô

ð ৡ Ô

ð Ô

```
Ruijie(config)# drr-queue bandwidth 1 2 3 4 5 6 7 8
```

ð ¾Ô

show mls qos queueing

59.2.14 mls qos map ip-prec-dscp

ippre DSCP

mls qos map ip-prec-dscp dscp1...dscp8

no mls qos map ip-prec-dscp

ð Ô

dscp ' ¼ a ¿ a ¿

no '

ð Ô

ð ¾ Ô

ð Ô

```
Ruijie(config)# mls qo map ip-prec -dscp 8 10 16 18 24
26 32 34
```

ð ¾Ô

show mls qos maps dscp-cos maps,dscp-cos maps ip-prec-dscp maps

wfq-queue bandwidth

wfq ЮЎ ¾ Â

wfq-queue *queue-id* **bandwidth** *min max*

no wfq-queue *queue-id* **bandwidth**

ð Ô

queue-id Ñ

min '

max '

ð Ô

min й kbps

max ꝺ kbps

ð ꝛ Ô

ð Ô

wfq Ə˘ ꝛ ˩ Л

Â

ð Ô

wfq '

```
Ruijie(config)# mls qos scheduler wfq
Ruijie(config)# show mls qos scheduler
```

'

```
Ruijie(config-if)# wfq-queue 2 bandwidth 10 10240
Ruijie(config-if)# wfq-queue 4 bandwidth 7 10240
Ruijie(config-if)# show running
```

ð ꝛ Ô

ꝛ	
show mls qos scheduler	QOS

ð ˩ Ô

˚ RGOS10.1 Л Э

wfq-queue sp

wfq Ю˘ ꝛ ш

˝l (sp) Â

wfq-queue *queue-id* **sp**

no wfq-queue *queue-id* **sp**

ð Ô

queue-id ˥l

sp: ш ˝l

ð Ô

a sp

ð ꝛ Ô

ð Ô

wfq Э˘ ৡ ৸ Л৬ Л৬ sp+wfq
Â

ð Ô

wfq '

```
Ruijie(config)# mls qos scheduler wfq
Ruijie(config)# show mls qos scheduler
```

1 3 ѝ ш '

```
Ruijie(config)# wfq-queue 1 sp
Ruijie(config)# wfq-queue 3 sp
Ruijie(config)# show running
```

ð ৡ Ô

ৡ	
show mls qos scheduler	QOS

ð ৸ Ô

˚ RGOS10.1 Л৬ Э

virtual-group

Aggregate Port ѝ Â
ৡ no Â

virtual-group *virtual-group-number*

no virtual-group *virtual-group-number*

ð Ô

virtual-group-number	Л˘ Л˘ 128

ð Ô

a

ð ৡ Ô

ð Ô

৭ Aggregate Port Â
৸ ´

˘ ´ 48 ˘ ʁ ˦ 24

ʌ 24

ð Ô

Ю Л 1/3 3 '

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

ð ֽ Ô

ֽ	
show virtual-group	

ð ʌ Ô

˚ RGOS10.1 ЛЭ

59.3 ĮĈQ •

59.3.1 show class-map

policy-name ' policy name ؍

class-name ' class map ؍

ð Ô

policy name

ð ֳ Ô

ð Ô

```
Ruijie# show policy-map
```

59.3.3 show mls qos interface

QoS

show mls qos interface *interface-id* [**policers**]

ð Ô

interface-id '

policers ' police

ð Ô

QOS

ð ֳ Ô

ð Ô

```
Ruijie# show mls qos interface fastEthernet 0/1
```

59.3.4 show mls qos virtual-group

police

show mls qos virtual-group [*virtual-group-number* | **policers**]

ð Ô

virtual-group-number '

policers ' police

ð Ô

police

ð ৡ Ô

ip-prec-dscp ' ip-prec-dscp maps

ð Ô

dscp-cos maps dscp-cos maps ip-prec-dscp maps

ð ৡ Ô

ð Ô

Ruijie# **show mls qos maps**

ð ৶ Ô

S8600 **cos-dscp dscp-cos ip-prec-dscp**

59.3.8 show mls qos rate-limit

8

show mls qos rate-limit [**interface** *interface-id*]

ð Ô

interface ' interface-id rate-limit ৡ

ð ৡ Ô

ð Ô

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

.14375 173.88 50509 /C2_0 1summaryc 4.16 0 Td ( )

rat 89.1 T

```
Ruijie# show virtual-group 1
Ruijie# show virtual-group summary
```

60 WRED

60.1 WRED

ð Ô

Queue1	Threshold1	CoS	0˜ 1˜ 2˜ 3˜ 4˜ 5˜ 6˜ 7
		WRED-drop	100%low˜ 100%high
		random-detectprobability	100%
	Threshold2	CoS	NONE
		WRED-drop	80% low˜ 100%high
		random-detectprobability	80%
	Threshold3	CoS	S86 a
		WRED-drop	S86 a
		random-detectprobability	S86 a
Queue2	Threshold1	CoS	S86 a
		WRED-drop	S86 a
		random-detectprobability	S86 a
	Threshold2	CoS	S86 a
		WRED-drop	S86 a
		random-detectprobability	S86 a
	hreshold3	CoS	S86 a
		WRED-drop	S86 a
		random-detect probability	S86 a

ð Ô

&

æ ˘ ৡ Â
˘ ৡ no Â æ æ ৶ Â

wrr-queue random-detect min-threshold *queue_id thr1 [thr2 thr3]*

no wrr-queue random-detect min-threshold *queue_id*

ð Ô

queue_id	৸
thr1	æ
thr2	ɣ æ
thr3	Ь æ

ð Ô

ð ৡ Ô

ð Ô

WRED Ю ৶ Â WRED
WRED ৶ Â ৶ WRED
˘ ≠ ৶ è Â
S86 Â
S86 ৶ 2

ð Ô

Ю 1 æ '

```
Ruijie(config-if)# wrr-queue random-detect min-threshold 1 68 69 70
```

ð ৡ Ô

ৡ	
-	-

ð ৸ Ô

ð ৡ ৸ Ô

৸	
-	-

60.2.3 wrr-queue random-detect probability

˘ ৡ Â
˘ ৡ no Â

wrr-queue random-detect min-threshold *queue_id prob1 [prob2 prob3]*

no wrr-queue random-detect min-threshold *queue_id*

ð Ô

queue_id	Ñ’
prob1	
prob2	¥
prob3	Þ ˆ S86 ˜

ð Ô

ð ¾ Ô

ð Ô

WRED ÞÙ Ù Â WRED

WRED Ù Â Ù WRED

˘ ≠ Ù è Â

S86 Â

S86 Ù 2 Â

ð Ô

ÞÙ 1 ' ÐÈ â p àÐ

```
Ruijie(config-if)#wrr-queue random-detect probability 1 61 62 63
```

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queue_id	Л
cos_value	cos ^ 1 ˘ 8 ˘ 0~7˜ '

ð Ô

cos Â

ð ¾ Ô

ð Ô

Л Л DSCP-CoS CoS-threshold DSCP б threshold Â

Э CoS Л threshold ˘ Э WRED RED Â

ð Ô

Ю cos и 1 à 6 γ ^ cos б ˘ Ю priority-queue cos-map ¾˜ '

```
Ruijie(config-if)#wrr-queue cos-map 2 1 6
```

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-	-

ð ¾ Ô

ð Ô

ð Ô

Ю show queueing wred interface g0/1 '

```
-----   -----   -----   ------   -----   -----   ------
qid max_1 min_1 prob_1 max_2 min_2 prob_2 max_3 min_3 prob_3
-----   -----   -----   ------   -----   -----   ------
1    0    0    90      0      0      91      0     0     92
2    88   66   90     87     55     91      86    66    92
3    0    0     0      0      0      0       0     0     0
4    0    0     0      0      0      0       0     0     0
5    88   66    0     89     67     0       90    68     0
6    0    0     0      0      0      0       0     0     0
7    0    0     0      0      0      0       0     0     0
8    0    0     0      0      0      0       0     0     0
cos  qid  threshold_id
---   ---   ------------
0    1    1
1    2    1
2    3    1
3    4    2
4    5    1
5    6    3
6    7    2
7    8    1
```

ð ¾Ô

¾	

```
vrrp 1 authentication x30dn78k
```

ð ३ Ô

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Ruijie(config-if)# **vrrp** *group ip*
ipaddress [**secondary**]

३	

Ruijie(config-if)# **vrrp** *group* **ip**

61.1.4 vrrp ip

ֽ Э VRRP IP ˘ è **no**
Э VRRP ╖ ↓ IP Â

vrrp *group* **ip** *ipaddress* [**secondary**]

no vrrp *group* **ip** *ipaddress* [**secondary**]

ð Ô

group ' VRRP /'

ipaddress ' IP '

secondary ' IP Â

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Ю˘ Э VRRP ╖ Â

ð ֽ Ô

ð Ô

a secondary ˘ ж IP й ў IP
Â ˘ VRRP Л IP ˘ no
ֽ ↓ VRRP IP ˘ й ˘ й
Э ч ↓ IP Â

ð Ô

Ю ˘ Л 0 Э VRRP ╖ Â VRRP /
й 1˘ ў IP й 10.0.1.20˘ IP й 10.0.2.20 Â

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

ð ֽ Ô

ֽ	

vrrp *group* **preempt** [**delay** *seconds*]

no vrrp *group* **preempt** [**delay**]

ð Ô

group ' VRRP Л

delay *seconds* ' ┘ ˘ Ћ Master
Â ѝ 0 Â

ð Ô

Ю˘ Э VRRP ╖ Â VRRP ╖ ˘
VRRP ´ Ю Â

ð ֽ Ô

ð Ô

VRRP ´ Ю˘ ″I
Master ″I ˘ ´ ѝ VRRP ў Â VRRP
´ Ю˘ ″I Master ″I ˘
≠ a ´ ѝ VRRP ў ÂVRRP Л IP
Ю˘ ´ Ћ a ˘ ѝ VRRP έ
″I ˘ ╟ ѝ VRRP ў Â

ð Ô

Ю ˘ VRRP ″I (200) ў
″I ˘ 15 Л ´ ѝ ў Â

```
vrrp 1 preempt delay 15
vrrp 1 priority 200
```

ð ֽ Ô

ֽ	
Ruijie(config-if)# **vrrp** *group* **ip** *ipaddress* [**secondary**]	VRRP ╖ IP
Ruijie(config-if)# **vrrp** *group* **priority** *level*	VRRP ″I

61.1.6 vrrp priority

ֽ VRRP ″I ˘ è **no** Â

vrrp *group* **priority** *level*

no vrrp *group* **priority**

ð Ô

group ' VRRP /I

level ' VRRP ″I

ð Ô

ЮЎ Э VRRP ╖ Â VRRP ╖ ˘
VRRP è ″I ѝ 100 Â

ð ৡ Ô

ð Ô

ৡ ╟ VRRP ″I Â

ð Ô

Ю VRRP 1 ″I ѝ 254 Â

```
vrrp 1 priority 254
```

ð ৡ Ô

WçTÏRð ð $€g% c SM°NÂ TÔÐ ð ÔÞà -Òð4Ã • Á À / ê F0E1 RñÏ• ÊÝ^DAFd ~Í¡ ‘c

ð Ô

VRRP ў ˘ Л∪ VRRP
VRRP à ″I Л∪ è Â

ð Ô

Ю ˘ VRRP й 4 Â

```
vrrp 1 timers advertise 4
```

ð ꝛ Ô

ꝛ	
Ruijie(config-if)# **vrrp** *group* **ip** *ipaddress* [**secondary**]	VRRP ╖ IP
Ruijie(config-if)# **vrrp group timers learn**	˝ ╖

61.1.8 vrrp timers learn

ꝛ ˝ ╖ ˘ è no ╖ Â

vrrp *group* **timers learn**

no vrrp *group* **timers learn**

ð Ô

group ' VRRP Л

ð Ô

Ю˘ Э VRRP ╖ Â VRRP ╖ ˘
Ю ˝ ╖ Â

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ð Ô

˝ ╖ ˘ VRRP ˘
˝ ╖ Л˘ ÿ ў VRRP ˝ VRRP
˘ Master ˘ a
VRRP Â ꝛ ˩ Л∪ б Master VRRP
˩ Â

ð Ô

Ю VRRP 1 Э ˝ ╖ Â

```
vrrp 1 timers learn
```

ð ꝛ Ô

ֽ	
Ruijie(config-if)# **vrrp** *group* **ip** *ipaddress* [**secondary**]	VRRP ╖ IP
Ruijie(config-if)# **vrrp** *group* **timers advertise** [**msec**] *interval*	VRRP

61.1.9 vrrp track

VRRP **vrrp** *group* **track** *interface-type number* ֽˇ VRRP IP ╖ ˇ **vrrp** *group* **track** *ip-address* ֽˇ **vrrp** *group* **track bfd** BFD IP˝ è **no** ╖ Â ֽ Ю˙

vrrp *group* **track** [*interface-type number*| **bfd** *interface-type interface-number ipv4-addess*] [*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 ' VRRP /ł

interface-type '

number ' /ł

ipv4-addres ′ IPv4 ˇ bfd

interval-value ' ┘ Â a ˇ ỳ 3

timeout-value ' ầ a ┘ Â a ˇ ỳ 1

priority ' ┘ ┘ è VRRP ″I ┘ Â a ˇ ỳ 10

ð Ô

Ю˝ Э VRRP ╖ Â VRRP ╖ ˇ IP ╖ 4

ֽ Л Ъ ֽ ˘ ֽ Ь
ֽ (Routed Port ˘ SVI ˘ Loopback˘ Tunnel) ’
IP ֽ ˘ ping Â

ð ¥ VRRP(Ê VRRP(Ê

- **debug vrrp events**
- **debug vrrp packets**
- **debug vrrp state**

61.2.1 debug vrrp

ৡ VRRP à VRRP Y à VRRP Л
˘ è **no** ╖ Â

debug vrrp

no debug vrrp

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Ю ˘ VRRP Â

```
Ruijie# debug vrrp
Ruijie#
VRRP: Grp 1 Advertisement priority 120, ipaddr
192.168.201.213
VRRP: Grp 1 Event - Advert higher or equal priority
%VRRP-6-STATECHANGE: FastEthernet 0/0 Grp 1 state Master
-> Backup
VRRP: Grp 1 Advertisement from 192.168.201.213 has
invalid virtual address 192.168.1.1
%VRRP-6-STATECHANGE: FastEthernet 0/0 Grp 1 state Backup
-> Master
Ruijie#
```

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ৡ	
Ruijie# **debug vrrp errors**	VRRP
Ruijie# **debug vrrp events**	VRRP Y˝
Ruijie# **debug vrrp state**	VRRP

61.2.2 debug vrrp errors

ৡ VRRP ˘ è no Â

debug vrrp errors

no debug vrrp errors

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ЮЎ VRRP Â

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ЮЎ VRRP Â

```
Ruijie# debug vrrp errors
Ruijie#
VRRP: Grp 1 Advertisement from 192.168.201.213 has
invalid virtual address 192.168.1.1
VRRP: Grp 1 Advertisement from 192.168.201.213 has
invalid virtual address 192.168.1.1
VRRP: Grp 1 Advertisement from 192.168.201.213 has
invalid virtual address 192.168.1.1
```

61.2.3 debug vrrp events

ৡ VRRP Y˚ ˘ è no Â

debug vrrp events

no debug vrrp events

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ЮЎ VRRP Y˚ Â

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ЮЎ VRRP Y˚ Â

```
Ruijie# debug vrrp events
VRRP: Grp 1 Event - Advert higher or equal priority
VRRP: Grp 1 Event - Advert higher or equal priority
VRRP: Grp 1 Event - Advert higher or equal priority
```

61.2.4 debug vrrp packets

ৡ VRRP ˘ è **no** Â

debug vrrp packets

no debug vrrp packets

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ЮЎ VRRP Â

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ЮЎ ˘ VRRP ˘ è VRRP 1 Â

```
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
```

ЮЎ , VRRP ˘ è VRRP 1 IP Л∪ VRRP 1 ″I Â

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

61.2.5 debug vrrp state

ꝛ VRRP ˘ è no Â

debug vrrp state

no debug vrrp state

ð Ô

ЮЎ VRRP Â

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ð Ô

ЮЎ ˘ VRRP Â

```
Ruijie# debug vrrp state
Ruijie#
%VRRP-6-STATECHANGE: FastEthernet 0/0 Grp 2 state Master
-> Backup
%VRRP-6-STATECHANGE: FastEthernet 0/0 Grp 2 state Backup
-> Master

Ruijie# config terminal
Enter configuration commands, one per line.  End with
CNTL/Z.

Ruijie(config)# interface fastethernet 0/0
Ruijie(config-if)# no shutdown
Ruijie(config-if)# end
Ruijie#
%VRRP-6-STATECHANGE: FastEthernet 0/0 Grp 2 state Master
-> Init
```

61.3

61.3.1 show vrrp

ৡ VRRP Â

show vrrp [**brief** | *group*]

ð Ô

brief ' ˩ ˘ VRRP

group ' VRRP /ı

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a ˩ ˘ VRRP Â

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VRRP

```
Ruijie# show vrrp
FastEthernet 0/0 - Group 1
State is Backup
Virtual IP address is 192.168.201.1 configured
Virtual MAC address is 0000.5e00.0101
Advertisement interval is 3 sec
Preemption is enabled
```

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Ю Л Е1/0 Э VRRP

```
Ruijie# show vrrp interface fastethernet 0/0
FastEthernet 0/0 - Group 1
State is Backup
Virtual IP address is 192.168.201.1 configured
Virtual MAC address is 0000.5e00.0101
Advertisement interval is 3 sec
Preemption is enabled
min delay is 0 sec
Priority is 100
Master Router is 192.168.201.213 , pritority is 120
Master Advertisement interval is 3 sec
Master Down interval is 9 sec
FastEthernet 0/0 - Group 2
State is Master
Virtual IP address is 192.168.201.2 configured
Virtual MAC address is 0000.5e00.0102
Advertisement interval is 3 sec
Preemption is enabled
min delay is 0 sec
Priority is 120
Master Router is 192.168.201.217 (local), priority is
120
Master Advertisement interval is 3 sec
Master Down interval is 9 sec
```

ð ¾ Ô

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

62 BFD

62.1

62.1.1 bfd

ЮO **bfd** ৡ BFD ˘ ⅃Ⅱ∪ **no** ৡ
BFD Â

bfd interval *milliseconds* **min_rx** *milliseconds* **multiplier** *multiplier-value*

no bfd interval *milliseconds* **min_rx** *milliseconds* **multiplier** *multiplier-value*

ð Ô

	BFD BFD ⁸ ˘
Interval *milliseconds*	*mi l l F•* - @ U)

```
Ruijie(config-if)# bfd interval 100 min_rx 100 multiplier 3
```

ð ३ Ô

३	
bfd all-interfaces	б BFD ╟Â
clear bfd	BFD Â
ip ospf bfd	OSPF б BFD ╟Â
ip rip bfd	RIP б BFD ╟

ð ⊿ Ô

62.1.2 bfd all-interfaces

router (RIP,OSPF)Ю **bfd all-interfaces** ३
б BFD ╟˘ **no** ३ ╖ Â

bfd all-interfaces

no bfd all-interfaces

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-	-

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a б BFD ╟

ð ३ Ô

ð Ô

ч ⊿Л∪ б BFD ╟'
' OSPF RIP Ю [**no**] **bfd all-interfaces** ३
б BFD ╟'
γ ' ⊿Л∪ **ip ospf bfd** [**disable**] **ip rip bfd** [**disable**]
३ OSPF RIP б BFD ╟'

ð Ô

Ю OSPF б BFD ╠ Â
Ruijie(config)# **router ospf** 123
Ruijie(config-router)# **bfd all-interface**

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bfd	BFD Â
ip ospf bfd	OSPF б BFD ╠ Â
ip rip bfd	RIP б BFD ╠

ð ↓ Ô

62.1.3 bfd cpp

Ю **bfd cpp** ¾ BFD ˘ **no** ¾ BFD Â

bfd cpp

no bfd cpp

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Ю BFD

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ð Ô

BFD ˘ BFD ╖ ↓ ↓Л BFD Â BFD ╖ ↓ ˘ Э BFD ˘ BFD ˘ ÿ Э б è BFD Â ╖ ⁸ Â

ð Ô

BFD Â

```
Ruijie(config)# bfd cpp
```

ð ˜ Ô

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ð Ù Ô

62.1.4 bfd echo

Ю **bfd echo** ˜ echo ˇ **no** ˜ echo Â

bfd echo

no bfd echo

ð Ô

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Ю BFD echo

ð ˜ Ô

ð Ô

Ю BFD Ù ╠ echo ˇ echo **Interval milliseconds** **min_rx** *milliseconds* Â

~ ˜ a L3 AP Ю BFD ECHO , BFD Э **no ip redirects** ICMP ╗ ˇ **no ip deny land** ˜ DDOS ╗ (Land-based) Echo BFD ч

ð Ô

```
# Routed Port FastEthernet 0/2 Э echo Â
Ruijie(config)# interface fastEthernet 0/2
```

```
Ruijie(config)# no switchport
Ruijie(config-if)# bfd echo
```

ð ३ Ô

३	
bfd	BFD Â
ip redirects	ICMP ╖ Â
ip deny land	Land-based ╖ Â
bfd slow-timer	

ð ✓ Ô

62.1.5 bfd slow-timer

Ю **bfd slow-timer** ३ BFD ECHO ╖ ✓˘
˘ BFD BFD ⁸ Â ⌈ . Ў ط

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

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bfd echo	BFD Echo ¶

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62.1.6 bfd up-dampening

ÍO, UP UP Â

no ¾ Â

bfd up-dampening [*milliseconds*]

no bfd up-dampening

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10.3(5)	ȝ

62.1.7 ip ospf bfd

Ю **ip ospf bfd** ȝ OSPF б BFD ╠˘ **disable** ˘ **no** ȝ Â

ip ospf bfd [**disable**]

no ip ospf bfd

ð Ô

disable	(ȷ) Э OSPF б BFD ╠ Â

ð Ô

disableě й OSPF б BFD ╠

ð ȝ Ô

ð Ô

ч ȷ Л∪ OSPF б BFD ╠'

' OSPF Ю [**no**] **bfd all-interfaces** ȝ б BFD ╠'

γ ' ȷ Л∪ **ip ospf bfd [disable]** ȝ OSPF б BFD ╠'

ð Ô

Routed Port FastEthernet 0/2 Э OSPF б BFD ╠.

```
Ruijie(config)# interface FastEthernet 0/2
Ruijie(config-if)# no switchport
Ruijie(config-if)# ip ospf bfd disable
```

ð ȝ Ô

¾	
bfd	BFD Â
bfd all-interfaces	б BFD ╟

ð Ô

62.1.8 ip rip bfd

Ю **ip rip bfd** ¾ RIP б BFD ╟˘ **disable** ˘ **no** ¾ Â

ip rip bfd [**disable**]

no ip rip bfd

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disable	(┘) Э RIP б BFD ╟ Â

ð Ô

disableˇ й RIP б BFD ╟

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ч ┘Л RIP б BFD ╟'

' RIP Ю [**no**] **bfd all-interfaces** ¾ б BFD ╟'

γ ' ┘Л **ip rip bfd [disable]** ¾ RIP б BFD ╟'

ð Ô

Routed Port FastEthernet 0/2 Э RIP б BFD ╟ Â

```
Ruijie(config)# interface FastEthernet 0/2
Ruijie(config-if)# no switchport
Ruijie(config-if)# ip rip bfd disable
```

ð ¾ Ô

```
Ruijie(config-if)# ip address 172.16.0.1 255.255.255.0
Ruijie(config-if)# bfd interval 50 min_rx 50 multiplier 3
Ruijie(config-if)# ip route static bfd FastEthernet 0/1 172.16.0.2
```

```
Ruijie(config-if)# ip route 10.0.0.0 255.0.0.0 FastEthernet
0/1 172.16.0.2
```

ð ¾Ô

¾	
bfd	BFD Â

ð ¼ Ô

62.1.10 neighbor fall-over bfd

router address-family Ю, **neighbor fall-over** ¾ BGP б BFD ╟ ┘ ╕ BGP , **no** ¾ ╕

neighbor *ip-address* **fall-over bfd**

no neighbor *ip-address* **fall-over bfd**

ð Ô

ip-address	BGP Â

ð Ô

BGP a BFD ╕

ð ¾ Ô

ð Ô

~ ″I IP BFD

ð Ô

BGP BFD ˇ BFD б 172.16.0.2

```
Ruijie(config)# router bgp 44000
Ruijie(config-router)# bgp log-neighbors-changes
Ruijie(config-router)# neighbor 172.16.0.2 remote-as 45000
```

```
Ruijie(config-router)# neighbor 172.16.0.2 fall-over bfd
Ruijie(config-router)# end
```

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bfd	BFD Â

ð ¼ Ô

62.1.11 set ip next-hop verify-availability

Route-map Ю **set ip next-hop verify-availability** ¾ BFD TRACK IP Л Ю Â **no** ¾ ¶ Â

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

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

ð Ô

vrf *vrf-name*	(¼) VRF ¼
next-hop-address	(¼)Ю IP
track	(¼) Track Л Ю
number	(¼)track Л
bfd	(¼) BFD
interface-type *interface-number*	(¼) Л
gateway	**(¼) IP й BFD IP Â** **Ю й BFD ¼ Â**

ð Ô

a BFD ¶

ð ¾ Ô

ð Ô

~	″I	IP	BFD

ð Ô

BFD ˘ BFD б 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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ð Ô

~ ″I IP BFD VRRP , ३ ↓ ѝ IP

ð Ô

VRRP BFD ˘ BFD ў

```
Ruijie#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)#interface FastEthernet 0/1
Ruijie(config-if)#no switchport
Ruijie(config-if)#ip address 192.168.201.11 255.255.255.0
Ruijie(config-if)#bfd interval 50 min_rx 50 multiplier 3
Ruijie(config-if)#vrrp 1 priority 120
Ruijie(config-if)#vrrp 1 ip 192.168.201.1
Ruijie(config-if)#vrrp 1 bfd 192.168.201.12
Ruijie(config-if)#end
```

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३	
bfd	BFD Â

ð ↓ Ô

62.2

BFD ЛЬЮ ३'

Â show bfd neighbors

62.2.1 show bfd neighbors

BFD

show bfd neighbors [**vrf** *vrf-name*] [**ipv4** *ip-addess* [**details**]| **ipv6** *ip-addess* [**details**] | **client** {**bgp|ospf|rip|vrrp|static-route|**} [**ipv4** *ip-addess* [**details**] | **ipv6** *ip-addess* [**details**]| **details**]]

ð Ô

vrf *vrf-name*	(↵) VRF ↵ Â
client	(↵)
bgp	BGP ╟ BFD
ospf	OSPF ╟ BFD
rip	RIP ╟ BFD
vrrp	VRRP ╟ BFD
static-route	StaticRoute ╟ BFD
pbr	PBR ╟ BFD
ipv4 *ip-addess*	↵ IPv4
ipv6 *ip-addess*	↵ IPv6
details	

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ð Ô

show bfd neighbors ¾ ÞÖ

```
Ruijie# show bfd neighbors

        OurAddr       NeighAddr    LD/RD  RH   Holdown(mult)  State
    Int
        172.16.11.1   172.16.11.2 1/2    1   532 (3 )      Up
    Ge2/1
```

show bfd neighbors details ¾ ÞÖ

```
        Ruijie# show bfd neighbors details

        OurAddr       NeighAddr    LD/RD  RH   Holdown(mult)  State
    Int
        172.16.11.1   172.16.11.2 1/2    1   532 (3 )      Up
    Ge2/1

        Local Diag: 0, Demand mode: 0, Poll bit: 0

        MinTxInt: 200000, MinRxInt: 200000, Multiplier: 5

        Received MinRxInt: 50000, Received Multiplier: 3

        Holdown (hits): 600(22), Hello (hits): 200(84453)
```

```
Rx Count: 49824, Rx Interval (ms) min/max/avg: 208/440/332
Tx Count: 84488, Tx Interval (ms) min/max/avg: 152/248/196
Registered protocols: BGP
Uptime: 02:18:49
Last packet:  Version: 1              - Diagnostic: 0
      I Hear You bit: 1        - Demand bit: 0
      Poll bit: 0              - Final bit: 0
      Multiplier: 3            - Length: 24
      My Discr.: 2             - Your Discr.: 1
      Min tx interval: 50000   - Min rx interval: 50000
      Min Echo interval: 0
```

OurAddr	IP
NeighAddr	IP
LD/RD	
RH	
Holdown(mult	hello
State	
Int	
Session state is UP and using	echo echo (Echo
Local Diag	
Demand	
Poll bit	
MinTxInt	
MinRxInt	
Multiplier	
Received	
Received	
Holdown (hits)	
Hello (hits)	hello
Rx Count	BFD
Rx Interval	
Tx Count	BFD
Tx Interval	

Registered Ą

Uptime UP

Last packet ∧ BFD

ð ३ Ô

३	
-	-

ð ∧ Ô

63 RERP

63.1

RERP ৡ ৡ à RERP ৡ Â

ৡ '

- **rerp enable**
- **rerp hello-interval**
- **rerp fail-interval**
- **rerp region**

RERP ৡ '

- **ring**
- **edge-ring**
- **major-ring**

63.1.1 rerp enable

ৡ ⁸ RERP ╖ Â

rerp enable

no rerp enable

ð Ô

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ð Ô

disable Â

ð ৡ Ô

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ð Ô

৸ RERP ˘ ὲ Â

ð Ô

Ю RERP '

```
Ruijie(config)# rerp enable
```

ð ३ Ô

३	
rerp region	RERP

63.1.2 rerp hello-interval

३ RERP ў Э Â

rerp hello-interval *interval*

no rerp hello-interval

ð Ô

interval ' ˘ ы й 1-6 Â

ð Ô

1 Â

ð ३ Ô

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3 Â

ð ৡ Ô

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ð Ô

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Ю й 6 '

Ruijie(config)# **rerp fail-interval** *6*

ð ৡ Ô

ৡ	
rerp hello- interval	

63.1.4 rerp region

ৡ RERP RERP Â

rerp region *num*

no rerp region *num*

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num ' , 1-64

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ð ৡ Ô

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Ю ৡ '

Ruijie# **rerp region** *1*

ð ৡ Ô

ৡ	

rerp enable	RERP ৡ

63.1.5 ring

RERP à ⁸ vlan Л ў ÿ Â

ring *num* **role** [**master** | **backup** | **transit**] **ctrl-vlan** *vid* **primary-port interface** *interface-id* **secondary-port interface** *interface-id*
no ring *num*

ð Ô

num' id

master | backup | transit' ў ⁸ à ў ÿ

vid' ⁸ vlan

interface-id'

ð Ô

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ð ৡ Ô

RERP Â

ð Ô

Ø RERP Ø , ɜ RERP Ø
Ø Master Ø Backup ˘ ╗ RERP ╟ ѝ trunk
˘ native vlan ╟ ѝ ⁸ vlan Â

ð Ô

Ю ৡ '

```
Ruijie(config)# rerp region 1
Ruijie(config-rerp)# ring 1 role master ctrl-vlan 100
primary-port interface GigabitEthernet 0/1
secondary-port interface GigabitEthernet 0/2
```

ð ৡ Ô

ৡ	
rerp region	RERP

63.1.6 edge-ring

˘ ৡ ˘ ”I RERP ring Â

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' id

primary-edge|secondary-edge' ў ÿ

vid' ⁸ vlan

interface-id'

ð Ô

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ð ٩ Ô

RERP Â

ð Ô

RERP ˘ ≠ ٩ ˘ ″I RERP ring Â

ð Ô

Ю ٩ '

```
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
```

ð ٩ Ô

٩	
rerp region	RERP
ring	rerp

63.1.7 major-ring

ѝ ⅃Л ў Э ˘ ў Э ѝ ў Â

major-ring *num* **edge-ring-vlan** *vid*

ð Ô

num ' ў id

vid 8 vlan

ð Ô

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ð Ô

RERP Â

ð Ô

majory-ring Â

ð Ô

ÞO

```
Ruijie(config)# rerp region 1
Ruijie(config-rerp)# major-ring 1 edge-ring-vlan 100
```

ð Ô

rerp region RERP

```
Ruijie# show rerp
rerp state                  : enable
rerp admin hello interval   : 1(*1s)
rerp admin fail interval    : 3(*1s)
rerp edge interval          : 1(*300 ms)
rerp local bridge           : 001a.a902.fe0b
-----------------------------------
region 1
ring                        : 1
rerp oper hello interval    : 1
rerp oper fail  interval    : 3
ring master                 : 001a.a902.fe0b
ctrl-vlan                   : 100
edge-vlan                   :
role                        : master
primary-port                : Gi 0/4(forwarding)
secondary-port              : Gi 0/21(down)
```

63.2.2 show rerp statistics

RERP Â

show rerp statistics region *num* **ring** *ring_id*

ð ৡ Ô

EXEC

ð Ô

Ю ৡ :

```
Ruijie# sh rerp statistics regiong 1 ring 1
The statistics for region 1 ring 1 GigabitEthernet 0/4
TX hello packets       23, RX hello packets        0
TX edge-hello packets   0, RX edge-hello packets   0
TX flush packets        0, RX flush packets        0
TX down packets         0, RX down packets         0
TX up packets           0, RX up packets           0
TX major fail packets   0, RX major fail packets   0
TX major resume packets 0, RX major resume packets 0
TX sub complete packets 0, RX sub complete packets 0


The statistics for region 1 ring 1 GigabitEthernet 0/5
TX hello packets       23, RX hello packets        0
TX edge-hello packets   0, RX edge-hello packets   0
TX flush packets        0, RX flush packets        0
```

```
TX down packets         0, RX down packets          0
TX up packets           0, RX up packets            0
TX major fail packets   0, RX major fail packets    0
TX major resume packets 0, RX major resume packets  0
TX sub complete packets 0, RX sub complete packets  0
```

63.2.3 clear rerp statistics

RERP Â

clear rerp statistics

ð ৡ Ô

EXEC

63.2.4 debug rerp

RERP ৮ Â ৡ no

64 REUP

64.1

REUP ৡ ৡ à ৡ Â

ৡ '

- **mac-address-table move update receive**
- **mac-address-table move update transmit**

ৡ '

- **switchport backup interface** *interface-id* [**preemption** {**mode** { **forced** | **bandwidth** | **off** } | **delay** *delay-time*}]
- **mac-address-table update group**

64.1.1 switchport backup interface *interface-id*

REUP ৻ Â

switchport backup interface interface-id

no switchport backup

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interface-id ' ID Â

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ы ы ˘ interface-id ы
Â ╟ ˥˘ Â

ð Ô

Ю ৻ ˘ fa 0/1 ы ы ˘ fa 0/2 ы
'

```
Ruijie(config)# interface fa 0/1
Ruijie(config-if)# switchport backup interface fa 0/2
```

ð ৡ Ô

ৡ	
show interface switchport backup	Э ৲ Â

64.1.2 switchport backup interface *interface-id* preemption

REUP ´ ╖ 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** *delay-time*

no switchport backup interface *interface-id* **preemption delay**

ð Ô

interface-id ' ID Â

delay-time ' ´ Â

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´ ѝ 35 Â

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ֽ	
show interface switchport backup	Э ֵ Â

64.1.3 mac-address-table move update receive

REUP MAC Â

mac-address-table move update receive

no mac-address-table move update receive

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disable Â

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ֵ ֿ ˘ Э MAC ˘
Ю Âй ɣ ˘ Э
MAC Â Э Э MAC
Â

ð Ô

Ю MAC '

```
Ruijie(config)# mac-address-table move update receive
```

ð ֽ Ô

ֽ	
mac-address-table move update transit	MAC Â

64.1.4 mac-address-table move update transit

REUP MAC Â

mac-address-table move update transit

no mac-address-table move update transit

ð Ô

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ð Ô

disable Â

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ù Ê ˘ Ю ˘ Ê Э
MAC ╖ Â

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Ю MAC '

Ruijie(config)# **mac-address-table move update transit**

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ֳ	
mac-address-table move update transit	MAC Â

64.1.5 mac-address-table update group

MAC Â

mac-address-table update group [*group-num*]

no mac-address-table update group

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grou„W2ñaF='„W2CÃØs!|'&—Ùw!mTÞ0Ø#ÈÙ

group-num : MAC ID

ð Ô

ð Ô

Ю ¶ MAC '

```
Ruijie(config-if)# mac-address-table update group 2
```

ð ¾ Ô

¾	
show mac-address-table update group detail	Э MAC Â

64.2

ЛЬЮ ¾'

Õ **show interfaces** [*interface-id*] **switchport backup** [**detail**]

Õ **show mac-address-table update group** [**detail**]

64.2.1 show mac-address-table update group [detail]

Э MAC Â

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detail: MAC

ð Ô

Э MAC Â

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EXEC

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Ю ¬ '

```
Ruijie# show mac-address-table update group detail
Mac-address-table Update Group:1
Received mac-address-table update message count:0
Group member  Receive Count    Last Receive Switch-ID
Receive Time
-------------------------------------------------------
Gi0/1         0               0000.0000.0000
Gi0/2         0               0000.0000.0000
```

64.2.2 show interfaces [*interface-id*] switchport backup [detail]

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interface-id **:** ৎ ID’

detail **:** ৎ Â

65 RLDP

65.1

RLDP ৻ ৻ à ৻ ৻ Â

৻ '

- Â rldp detect-interval
- Â rldp detect-max
- Â rldp enable
- Â rldp loop-detect enable

৻ '

65.1.1 rldp loop-detect enable

৻ ⁸ RLDP ╖ Â

rldp loop-detect enable

no rldp loop-detect enable

Â

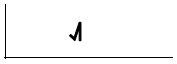
৻ Â

ৎ RLDP ˘ RLDP Â

Ю '

```
Ruijie(config)# rldp loop-detect enable
```

৻	
rldp port	RLDP ╖



65.1.3 rldp detect-max

ৡ RLDP Э ˘
˘ ÿ ˘ ѝ Â

rldp detect-max *num*

no rldp detect-max

num	, ৸ ѝ 2-10

2

ৡ Â

ৡ ˘ Â

Ю ѝ 5 '
`Ruijie(config)# rldp detect-max 5`

ৡ	
rldp detect-interval	

৸

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65.1.4 rldp enable

ৡ ⁸ RLDP ৻ ╖ Â

rldp enable

no rldp enable

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¾ Â

ˆ RLDP ˆ ˘ RLDP ˆ Â

Ю

```
Ruijie(config)# rldp enable
```

¾	
rldp port	RLDP RLDP

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rldp port	RLDP ╖

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65.1.6 rldp port

३ rldp ˘ ⊿ 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-detect	
warning	
shutdown-svi	shutdown svi
shutdown-port	shutdown
block	⌐

Â

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⊣ RLDP Ю˘ RLDP Â

Ю fas 0/1 Э rldp ˘ й ˘ й ⌐ Â

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

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rldp enable	rldp ৲

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65.1.7 rldp reset

৲ **rldp shutdown** **disable** rldp Â

rldp reset

-	-

৲ Â

Ю ৲ '

```
Ruijie# rldp reset
```

৲	
rldp enable	Rldp ৲

ৰ

৲ ৰ	
ৰ	
-	-

65.2

Â show rldp

Â debug rldp

65.2.1 show rldp

rldp Â

show rldp [**interface** *interface-id*]

Interface-id	

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65.2.2 debug rldp

rldp ৷ Â ৡ no Â

debug rldp [**packet | event | error**]

undebug rldp [**packet | event | error**]

packet	rldp Â
event	৸ Â
error	Â

RLDP

66 DLDP

66.1

DLDP ЛυЮ ३'

- Â dldp
- Â dldp passive
- Â clear dldp

66.1.1 dldp

DLDP ╖ Â ┘Лυ ३ no IP DLDP ╖ Â

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)#interface vlan 1
Ruijie(config-if-VLAN 1)#ip address 10.83.132.1 255.255.255.0 //
    vlan1    IP
Ruijie(config-if-VLAN 1)#dldp 10.83.132.10
  2'                10.83.131.10    DLDP      ℸ  '
Ruijie#config
Ruijie(config)#interface vlan 1
Ruijie(config-if-VLAN 1)#ip address 10.83.132.1 255.255.255.0 //
    vlan1    IP
Ruijie(config-if-VLAN 1)#dldp 10.83.131.10 next-hop 10.83.132.2 //
                ⅠO      IP
  3'            10.83.132.10    DLDP      ℸ  '
Ruijie#config
Ruijie(config)#interface vlan 1
Ruijie(config-if-VLAN 1)#no dldp 10.83.132.10
```

˘ ч DLDP˝ ч ICMP Echo ˘

Â ɻ ICMP Echo ˘ ʅ

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з ≠ CPU Â

ɻЛ ў ╟ ICMP Echo й ў ╟ ˘ ╟ ICMP Echo

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४	10.3(5)Л७ ४ ˘ Â

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	-	-

66.3

66.3.1 clear dldp

dldp up/down ˘
Â

clear dldp [**interface** *interface-name* [*ip-address*]]

interface-name	Ь ४
ip-address	IP

३	

DLDP up/down ˘ ३ ४ Л७
up/down ˘ з Â Ь IP ˘ ४ Л७
Ь Э up/down Â Ь
IP ˘ up/down Â

1' up/down '

```
Ruijie#clear dldp
```

2' interface vlan 1 Э up/down '

```
Ruijie#clear dldp interface vlan 1
```

3' interface vlan 1 Э 10.83.132.1 up/down '

```
Ruijie# clear dldp interface vlan 1 10.83.132.1
```

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४	10.3(5)Л७ ४ ˘ Â

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	-	-

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CPU è ˘
Â ¢ γ ˘ è (AP) a
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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 ' Ì

67.2 TPP

67.2.1 show tpp

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show tpp

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¢ tpp Â

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```
Ruijie# show tpp
```

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topology guard ' Ì

68

68.1

- **redundancy**
- **auto-sync**
- **auto-sync time-period**
- **switchover timeout**
- **redundancy reload**
- **redundancy forceswitch**

68.1.1 redundancy

redundancy

redundancy

auto-sync à auto-sync time-period à switchover timeout

```
Ruijie# config terminal
Ruijie(config)# redundancy
Ruijie(config-red)# exit
Ruijie(config)#
```

68.1.2 auto-sync

runing-config б startup-config

auto-sync { **standard | running-config | startup-config**}

no auto-sync { **standard | running-config** | **startup-config**}

standard '

running-config '

startup-config '

auto-sync standard

standard

startup-config

```
Ruijie(config)# redundancy
Ruijie(config-rdnd)# auto-sync startup-config
Ruijie(config-rdnd)# exit
Ruijie(config)#
```

starup-config

```
Ruijie(config)# redundancy
Ruijie(config-rdnd)# no auto-sync startup-config
Ruijie(config-rdnd)# exit
Ruijie(config)#
```

68.1.3 auto-sync time-period

runing-config б startup-config

auto-sync time-period *value*

no auto-sync time-period

value

ð Ô

```
Ruijie# config terminal
Ruijie(config)# redundancy
Ruijie(config-red)# switchover timeout 4000
Ruijie(config-red)# exit
Ruijie(config)#
```

68.1.5 redundancy reload

privileged EXEC ЮЎ ┘ **redundancy reload** ʒ Æ Slave Master Slave Æ

redundancy reload {**peer** | **shelf**}

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```
Ruijie# redundancy forceswitch
Proceed with switchover to standby PRE? [confirm] y
```

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```
                peer state = 37 -Standby Hot
            ...
```

68.2.2 show redundancy auto-sync

ㄴЛ∪ user EXEC privileged EXEC Ю˝ show redundancy auto-sync ϡ ㄴЛ∪ redundancy ╟ ㄴ Â(έ Ⱶ̸ auto-sync ϡ)

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```
Ruijie> enable
Ruijie# show redundancy auto-sync
Redundancy auto-sync mode: auto-sync standard.
  ...
```

68.2.3 show redundancy switchtimeout

ㄴЛ∪ user EXEC privileged EXEC Ю˝ show redundancy switchtimeout ϡ ㄴЛ∪ redundancy switchover Â

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```
Ruijie> enable
Ruijie# show redundancy switchtimeout
redundancy switch timeout is : 4000 ms.
  ...
```

69

69.1

- **cd**
- **cp**
- **ls**
- **makefs**
- **mkdir**
- **mv**
- **pwd**
- **rm**
- **rmdir**

69.1.1 cd

cd *DIRECTORY*

DIRECTORY

ls

tmp

```
Ruijie#
```

ϡ	
ls	

69.1.2 cp

˚ , ˚ ˚ Â

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 ˚ ɹ ( )

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˚ ˚ ˘ ˚ ˘

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~

˘ **cp** ϡ a 8 Â

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ЛЪЮ log.txt Э :

```
Ruijie# cp sour log.txt dest ../log_bak.txt
```

69.1.3 ls

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ls *PATHNAME*

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PATHNAME

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a .

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Ю

```
Ruijie# ls
```

tmp Ю

```
Ruijie# ls tmp
```

ð Ô

69.1.4 makefs

makefs dev *DEVNAME* **fs** *FSNAME*

makefs fs *FSNAME* **dev** *DEVNAME*

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DEVNAME ( )

FSNAME Э

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' a à (**type** **file**); b à '?' ╠
˘ a ж ˘ ⅄ Л ’? ’ ३
,Л ३ Â

ð Ô

Ю log.txt ╠ Э , ⅄ и config.txt, ⅄ ⅄
˚ , ⅄ ⅄ ˚ '

```
Ruijie# mv sour tmp/log.txt dest ../config.txt
```

Ю log.txt ╠ tmp Ю'

```
Ruijie# mv dest /mnt/tmp sour tmp/log.txt
```

69.1.7 pwd

pwd

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pwd	

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Ruijie# **pwd**

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69.1.8 rm

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rm *FILE*

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FILE ˚ ɻ( )

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ʎ ˘ a ˚ Â

ð Ô

Ю log.txt ˚ '

Ruijie# **rm** *log.txt*

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rmdir	, ѝ ϡ , Л∪ rm ϡ ≠ ɻЛ∪

69.1.9 rmdir

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rmdir *directory*

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directory ' ɻ, ѝ

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rm ϡ ϳ ϳЛ Â

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Ю tmp ˘ з ˇ Â

```
Ruijie# rmdir tmp
Ruijie# ls
```

70

70.1 CPU-LOG

ч ʒ'

- **show cpu**
- **cpu-log**

70.1.1 show cpu

CPU ˘ ʒ **show cpu** Â

show cpu

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ʒ ˩ Л↻ CPU ˘ 5 à 1
ǂ à 5ǂ CPU ˘ Л↻ Ь¦ 5
à 1ǂ à 5ǂ CPU Â

ð Ô

Ю **show cpu** Â

```
Ruijie# show cpu
=====================================
    CPU Using Rate Information
CPU utilization in five seconds: 25%
CPU utilization in one minute  : 20%
CPU utilization in five minutes: 10%
  NO   5Sec   1Min   5Min   Process
  0     0%    0%    0%    LISR INT
  1     7%    2%    1%    HISR INT
```

4	0%	0%	0%	printk_task
5	0%	0%	0%	waitqueue_process
6	0%	0%	0%	tasklet_task
7	0%	0%	0%	kevents
8	0%	0%	0%	snmpd
9	0%	0%	0%	snmp_trapd
10	0%	0%	0%	mtdblock
11	0%	0%	0%	gc_task
12	0%	0%	0%	Context
13	0%	0%	0%	kswapd
14	0%	0%	0%	bdflush
15	0%	0%	0%	kupdate
16	0%	3%	1%	ll_mt
17	0%	0%	0%	ll main process
18	0%	0%	0%	bridge_relay
19	0%	0%	0%	d1x_task
20	0%	0%	0%	secu_policy_task
21	0%	0%	0%	dhcpa_task
22	0%	0%	0%	dhcpsnp_task
23	0%	0%	0%	igmp_snp
24	0%	0%	0%	mstp_event
25	0%	0%	0%	GVRP_EVENT
26	0%	0%	0%	rldp_task
27	0%	2%	1%	rerp_task
28	0%	0%	0%	reup_event_handler
29	0%	0%	0%	tpp_task
30	0%	0%	0%	ip6timer
31	0%	0%	0%	rtadvd
32	0%	0%	0%	tnet6
33	2%	0%	0%	tnet
34	0%	0%	0%	Tarptime
35	0%	0%	0%	gra_arp
36	0%	0%	0%	Ttcptimer
37	8%	1%	0%	ef_res
38	0%	0%	0%	ef_rcv_msg
39	0%	0%	0%	ef_inconsistent_daemon
40	0%	0%	0%	ip6_tunnel_rcv_pkt
41	0%	0%	0%	res6t
42	0%	0%	0%	tunrt6
43	0%	0%	0%	ef6_rcv_msg
44	0%	0%	0%	ef6_inconsistent_daemon
45	0%	0%	0%	imid
46	0%	0%	0%	nsmd
47	0%	0%	0%	ripd
48	0%	0%	0%	ripngd
49	0%	0%	0%	ospfd

```
50    0%    0%    0%    ospf6d
51    0%    0%    0%    bgpd
52    0%    0%    0%    pimd
53    0%    0%    0%    pim6d
54    0%    0%    0%    pdmd
55    0%    0%    0%    dvmrpd
56    0%    0%    0%    vty_connect
57    0%    0%    0%    aaa_task
58    0%    0%    0%    Tlogtrap
59    0%    0%    0%    dhcp6c
60    0%    0%    0%    sntp_recv_task
61    0%    0%    0%    ntp_task
62    0%    0%    0%    sla_deamon
63    0%    3%    1%    track_daemon
64    0%    0%    0%    pbr_guard
65    0%    0%    0%    vrrpd
66    0%    0%    0%    psnpd
67    0%    0%    0%    igsnpd
68    0%    0%    0%    coa_recv
69    0%    0%    0%    co_oper
70    0%    0%    0%    co_mac
71    0%    0%    0%    radius_task
72    0%    0%    0%    tac+_acct_task
73    0%    0%    0%    tac+_task
74    0%    0%    0%    dhcpd_task
75    0%    0%    0%    dhcps_task
76    0%    0%    0%    dhcpping_task
77    0%    0%    0%    dhcpc_task
78    0%    0%    0%    uart_debug_file_task
79    0%    0%    0%    ssp_init_task
80    0%    0%    0%    rl_listen
81    0%    0%    0%    ikl_msg_operate_thread
82    0%    0%    0%    bcmDPC
83    0%    0%    0%    bcmL2X.0
84    3%    3%    3%    bcmL2X.0
85    0%    0%    0%    bcmCNTR.0
86    0%    0%    0%    bcmTX
87    0%    0%    0%    bcmXGS3AsyncTX
88    0%    2%    1%    bcmLINK.0
89    0%    0%    0%    bcmRX
90    0%    0%    0%    mngpkt_rcv_thread
91    0%    0%    0%    mngpkt_recycle_thread
92    0%    0%    0%    stack_task
93    0%    0%    0%    stack_disc_task
94    0%    0%    0%    redun_sync_task
95    0%    0%    0%    conf_dispatch_task
```

```
 96     0%     0%     0%    devprob_task
 97     0%     0%     0%    rdp_snd_thread
 98     0%     0%     0%    rdp_rcv_thread
 99     0%     0%     0%    rdp_slot_change_thread
100     4%     2%     1%    datapkt_rcv_thread
101     0%     0%     0%    keepalive_link_notify
102     0%     0%     0%    rerp_msg_recv_thread
103     0%     0%     0%    ip_scan_guard_task
104     0%     0%     0%    ssp_ipmc_hit_task
105     0%     0%     0%    ssp_ipmc_trap_task
106     0%     0%     0%    hw_err_snd_task
107     0%     0%     0%    rerp_packet_send_task
108     0%     0%     0%    idle_vlan_proc_thread
109     0%     0%     0%    cmic_pause_detect
110     1%     1%     1%    stat_get_and_send
111     0%     1%     0%    rl_con
112    75%    80%    90%    idle
```

Э ˘ 3 ↑ 5 à 1↑ à
5↑ CPU ^ LISR à HISR ┗~ ÂЮ
é CPU ↑ Â è ˘ ЊЖ Ю'

¸ No' /ſ

¸ 5Sec' ┗ 5 CPU

¸ 1Min' ┗ 1↑ CPU

¸ 5Min' ┗ 5↑ CPU

2 ˘↑ LISR CPU HISR
CPU ˘ ÿ 3 ˘ ┗ CPU Â ſ
idle CPU ˘ Windows Ю ľ System Idle Process ┗
˘ Â Э ˘ idle 5 CPU
ѝ 75%˜ CPU 75% Â

70.1.2 cpu-log

CPU , ┘ Л℧ **cpu-log** Â

cpu-*log* *log-limit low_num high_num*

ð Ô

log-limit ȝ

low_num CPU æ

high_num CPU

ð Ô

Ю ѝ 100%˘ æ ѝ 90%Â

ð ʒ Ô

Â

ð Ô

ʒ ↓Л↻ CPU æ ˘ CPU
Ю ˘ CPU ,
↓ ' CPU æ æ Л, ,
CPU Ю ˘ ↓ CPU
↓ ѝ æ æ Â

ð Ô

Ю CPU æ ѝ 70%˘ CPU
ѝ 80%Â

```
ruijie(config)# cpu-log log-limit 70 80
```

CPU 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%
```

CPU æ 70% 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!
```

70.2

Т Ь ʒ'

show memory
memory-lack exit-policy
show memory protocols

70.2.1 show memory

˘ ʒ **show memory**Â

show memory

ð Ô

worsen Л˘ Э ˘ Э

à OSPF à RIP à PIM-SM Â

policy (**bgp**|**ospf**|**pim-sm**|**rip**)

xit-policy

p	ù BGP OSPF PIM RIP Â
	ù Â

ò

show memory protocols

ò Ô

ò Ô

ò Ô

Â

a Â ÿ Â

&

ð ϡÔ

ϡ	
show threshold	ϡ

ð ✓ Ô

70.3.2

ЛЬЮ ϡ'

Â show threshold

show threshold

Â

show threshold {cpu | memory | temperature} [M1 | M2 | slot *n* **| member** *n***]**

ð Ô

**cpu	memory	temperature**	˘ Ь ˘ **cpu** ѝ CPU ˘ **memory** ѝ ˘ **temperature** ѝ
**M1	M2	slot** *n*	Æ˘ Э ˘ *n* ѝ ´ Л˘ Æ
member *n*	˘ Э ˘ *n* ѝ Л˘

ð Ô

ð ϡ Ô

Â

ð Ô

ð Ô

1' M1 CPU Â

```
Ruijie# show threshold cpu M1
```

2' Â

```
Ruijie# show threshold memory
```

ð ϡÔ

threshold set	

71

71.1

71.1.1 logging on

a ⅄ Э ˘ ⅋ Â
˘ ⅋ no Â

logging on

no logging on

ð Ô

ð Ô

a ⅄ Э Â

ð ⅋ Ô

ð Ô

RGOS a ⅃Ⅱ Console àVTY Э˘ ≠ ⅃Ⅱ
a ⅄ Э' ă ш àFLASH àSyslog Server Â
⅋ й ˘ ˘ a
˘ ш й 1 Log Â

ð Ô

Ю Э '

```
Ruijie(config)# no logging on
```

ð ⅋Ô

⅋	
logging buffered	ă ш
logging	Syslog Server
logging file flash:	FLASH Э
logging console	[8] ⅄ Э

logging monitor	VTY (telnet) Э
logging trap	Syslog Server

71.1.2 terminal monitor

VTY Э Â VTY Э

no Â

terminal monitor

terminal no monitor

ð Ô

ЮЎ VTY Э a VTY Э Â

ð Ô

ð Ô

VTY Â ù a

Â VTY Л

no logging buffered

Ю ч ѝ 6Л∪ æ 6 ѝ 10000
ă ѡ '

```
Ruijie(config)# logging buffered 10000 6
```

ð ϡ Ô

ϡ	
logging on	
show logging	ă ѡ
clear logging	ă ѡ

71.1.4 logging server

Syslog Sever Ю ϡ Â
Syslog server **Syslog Server**
ϡ no Â

logging server {*ip-address* [**vrf** *vrf-name*] | **ipv6** *ipv6-address*}

no logging server {*ip-address* [**vrf** *vrf-name*] | **ipv6** *ipv6-address*}

ð Ô

ip-address ў IP '

vrf vrf-name ў VRF VPN ~ '

ipv6 ipv6-address ў IPV6 '

ð Ô

a syslog server

ð ϡ Ô

ð Ô

ϡ Syslog server ÂRGOS
5 Syslog Server Â ل Syslog Server Â

ð Ô

Ю ѝ 202.101.11.1 syslog server

```
Ruijie(config)# logging server 202.101.11.1
```

Ю IPV6 ѝ AAAA:BBBB::FFFF

```
Ruijie(config)# logging server ipv6 AAAA:BBBB::FFFF
```

ð ȝ Ô

ȝ	
logging on	
show logging	ă ʍ ˘ Ո
logging trap	syslog server

71.1.5 logging file flash

FLASH ˘ Ю ȝ Â ɻ
FLASH ˘ ȝ no Â

logging file flash:*filename* [*max-file-size*] [*level*]

no logging file

ð Ô

filename ' ˚ ɹ Â a ˚ ˘ ѝ txt Â

max-file-size ' ˚ Â ÿ 128K 6M bytesˇ ѝ 128K Â

levell ' ˚ Â ɻ Ո ɹ ˘ ≠ ɻ Ո Â FLASH ѝ 6 Â ˘ 1 Â

ð Ô

a FLASH Â

ð ȝ Ô

ð Ô

Syslog Serverˇ a
˘ ɻ Ո FLASH Â

˚ ɻ ѝ ѝ txtˇ ˚ ɻ ɹ Â

~

˚ 8˘ ˚ ˘
è ˚ ˘ '
1. ˘ ˚
2. ˚ ɻ ˚ ɻ ʎ˘ ѝ' ˚ ɻ _ ʎ˘ ʎ
Ÿ txť
3. ʎ ѝ 15˝ ˘ ˚ Â ˘
FLASH ϡ˘ FLASH
16 ˚ '

ð Ô

Ю FLASH ˘ ˚ ɻ ѝ trace.txť ˚ ѝ
64K, ѝ 6Â

```
Ruijie(config)# logging file flash:trace
```

ð ϡ Ô

ϡ	
logging on	
show logging	ă ѡ ˘ Ո
more flash	FLASH

71.1.6 logging console

8 ʎ Э ˘ Ю
ϡ Â ϡ no 8 ʎ Э Â

logging console *level*

no logging console

ð Ô

level ' ш ˘ ÿ 0 7 Â ɻ Ո ɻ ˘ ≠ ɻ Ո
Â ш ˘ 1 Â

ð Ô

Debugging (7)

ð ϡ Ô

ð Ô

ш Л Ы Э æ ш
⁸ Л Э Â

show logging ϡ Л Â

ð Ô

Ю ⁸ Л й б

```
Ruijie(config)# logging console informational
```

ð ϡ Ô

ϡ	
logging on	
show logging	ă ш ˘ Л

71.1.7 logging monitor

VTY ^ telnet à SSH ~ Э
˘ Ю ϡ Â ϡ no VTY
Э Â

logging monitor *level*

no logging monitor

ð Ô

level ' ш Â Л Л Ы Л ˘ ≠ Л Л Â
ш ˘ 1 Â

ð Ô

Debugging (7)

ð ϡ Ô

ð Ô

VTY Э ˘ ″I ϡ **terminal monitor** VTY Â
logging monitor Ⱨ Â

Logging monitor Ⱨ VTY Â

ð Ô

Ю VTY Э й б

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

ð ϡ Ô

ϡ	
logging on	
show logging	ă ѡ ˘ Л

71.1.8 logging trap

Syslog Server ˘ Ю
ϡ Â ϡ no Syslog Server Â

logging trap *level*

no logging trap

ð Ô

level ' ш Â ↓ Л ɻ ˘ ≠ ↓ Л Â
ш ˘ 1 Â

ð Ô

Informational(6)

ð ϡ Ô

ð Ô

Syslog Serverˇ ″I ϡ logging
Syslog Server Â ˅ logging trap ш
Â

show logging ϡ ↓ Л Â

ð Ô

Ю й 6 й 202.101.11.22
Syslog Serverʼ

```
Ruijie(config)# logging 202.101.11.22
Ruijie(config)# logging trap informational
```

ð ϡ Ô

ϡ	

logging on	

lo source interface

Local7(23)

ð Ô

ð Ô

Syslog

2

Numerical Code	Facility
0	kernel messages
1	user-level messages
2	mail system
3	system daemons
4	security/authorization messages
5	messages generated internally by syslogd
6	line printer subsystem
7	network news subsystem
8	UUCP subsystem
9	clock daemon
10	security/authorization messages
11	FTP daemon
12	NTP subsystem
13	log audit
14	log alert
15	clock daemon
16	local use 0 (local0)
17	local use 1 (local1)
18	local use 2 (local2)

	19	local use 3 (local3)
	20	local use 4 (local4)
	21	local use 5 (local5)
	22	local use 6 (local6)
	23	local use 7 (local7)

RGOS й (local7) 23 Â

ð Ô

Ю Syslog й kernel

```
Ruijie(config)# logging facility kern
```

ð ϡ Ô

ϡ	
logging console	⁸ Л Э

71.1.12 logging count

Ⅶ ˘ Ю ϡ Â
Ⅶ ˘ ϡ no Â

logging count

no logging count

ð Ô

ð Ô

ð ϡ Ô

ð Ô

ϡ Ⅶ Âÿ ϡ Â **no logging count** ϡ ˘ Ⅶ ˘ 3 Â

ð Ô

Ⅶ '

```
Ruijie(config)# logging count
```

ð ϟ Ô

ϟ	
show logging count	
show logging	б ă ѡ

71.1.13 logging rate-limit

ˇ ˇ

Ю ϟ Â no

```
Ruijie(config)#logging rate-limit all 10 except
warnings
```

ð ϡ Ô

ϡ	
show logging count	
show logging	б ă ѱ

71.1.14 logging synchronous

б ۶ ˘
˘ Ю ϡ Â б ۶
˘ ϡ no Â

logging synchronous

no logging synchronous

ð Ô

ð Ô

Ю˘ б ۶ Â

ð ϡ Ô

ð Ô

ϡ б ۶ ˘ ۶Ћ
Â

ð Ô

```
Ruijie(config)#
Ruijie(config)#line console 0
Ruijie(config-line)#logging synchronous
```

ϡ ˘ UP-DOWN ˘ ϡ
'

```
Ruijie#configue terminal
Oct 9 23:40:55 %LINK-5-CHANGED: Interface
GigabitEthernet 0/1, changed state to down
Oct 9 23:40:55 %LINEPROTO-5-UPDOWN: Line protocol on
Interface GigabitEthernet 0/1, changed state to DOWN
```

╗ Э ˘ Ю ϡ Â
ϡ no ↓ Э Âdefault
ѝ Â

service timestamps *message-type* [*uptime* | *datetime* [*msec* | *year*]]

no service timestamps *message-type*

default service timestamps *message-type*

ð Ô

message-type ' ˘ ч log debug Â log ш
0 6 ˘ debug ш ѝ 7
Â

uptime ' ╠ ˘ ' * * *¶ * ˘ ' 07:00:10:41

datetime ˘ ' ' ↑ ' ˘ ' Jul 27 16:53:07

msec ˘ ' :↑ : . '
Jul 27 16:53:07.299

year ˘ ' :↑ : ' 2007
Jul 27 16:53:07

ð Ô

˘ ѝ Â RTC˘ ╠
ѝ ╠ Â

ð ϡ Ô

ð Ô

Uptime ÿ Э ╠ ˘
Æ ѝ Â Datetime ѝ ˘ . .
' ↑ ' Â

ð Ô

Ю Log Debug ˘ ѝ Datetime ˘
з '

```
Ruijie(config)# service timestamps debug datetime msec
Ruijie(config)# service timestamps log datetime msec
Ruijie(config)# end
Ruijie(config)# Oct  8 23:04:58.301 %SYS-5-CONFIG_I:
Configured from console by console
```

ð ϡ Ô

ϡ	

71.1.18 more flash

FLASH ˚ ˘ Ю ३'

more flash:filename

ð Ô

Filename ' ˚ ɹ

ð ३ Ô

ð Ô

FLASH ˚ ˚ ɹ ”//f2/˝ ”//f3/’ ˚ Â ३
ɻ ˚ ˘ a ३ è ˚ Â

ð Ô

Ю FLASH ˚ '

```
Ruijie# more flash://f2/log.txt
look up  file in the extended flash://f2/log.txt
00004 2004-11-17 4:1:32  Ruijie: %5:Reload.2]TJuestd fb-6(ey-6(e)]TJ0
```

Ruijie# **clear logging**

ð ϡÔ

ϡ	

```
00002 2004-11-17 10:20:59  Ruijie: %7:%LINE PROTOCOL
CHANGE: Interface FastEthernet 0/0, changed state to UP
00003 2004-11-17 10:57:18  Ruijie: %7:%LINK CHANGED:
Interface  FastEthernet  0/1,  changed  state  to
administratively down
00004 2004-11-17 10:57:21  Ruijie: %7:%LINK CHANGED:
Interface FastEthernet 0/1, changed state to down
00005 2004-11-17 10:57:41  Ruijie: %7:%LINK CHANGED:
Interface  FastEthernet  0/1,  changed  state  to
administratively down
00006 2004-11-17 10:57:43  Ruijie: %7:%LINK CHANGED:
Interface FastEthernet 0/1, changed state to down
```

2ËBÖ

Syslog logging

Syslog
Server
Trap logging
Log Buffer

logging on	
clear logging	

71.2.2 show logging count

show logging count

count **show logging count** **show logging**

```
Ruijie# show logging count
Module Name   Message Name Sev Occur     Last Time
==================================================
SYS           CONFIG_I       5   1       Jul 6 10:29:57
--------------------------------------------------
SYS TOTAL                        1
```

```
00003 2004-11-17 10:57:18  Ruijie: %7:%LINK CHANGED:
Interface FastEthernet 0/1, changed state to
administratively down
00002 2004-11-17 10:20:59  Ruijie: %7:%LINE PROTOCOL
CHANGE: Interface FastEthernet 0/0, changed state to UP
00001 2004-11-17 10:20:59  Ruijie: %7:%LINK CHANGED:
Interface FastEthernet 0/0, changed state to up
```

ð ϗ Ô

ϗ	
logging on	
clear logging	ă ϐ
show logging	б ă ϐ

72

72.1

ЛЬЮ

install

```
Slot    : 2
User Status  : installed
Software Status:87693e
```

```
Ruijie# show version module detail 2
Device  : 1
Slot    : 2
User Status  : none
Software Status: none
Online Module :
Type    :
Ports   : 0
Version :
Configured Module :
Type    :
Ports   :
Version :
Ruijie#
```

ð ϡ Ô

ϡ	
install slot-num *moduletype*	Э
show version slots	

72.1.3 remove configuration module slot-num

ϡ ˩ Ո Â

remove configuration module *slot-num*

ð Ô

slot-num /ˡ

ð ϡ Ô

ð Ô

ϡ ˩ Ո ˘ Æ Э
˘ ˩ Æ Â

ð Ô

```
Ruijie(config)# remove configure module 4
```

72.1.4 reset module slot-num

ϡ ˩ Ո Æ Â

reset module *slot-num*

ð Ô

slot-num' /ı

ð ϡ Ô

ð Ô

```
Ruijie# reset module 4
```

72.2

72.2.1 show version module detail [module-num]

ϡ ˩ ʃƱ Â

show version module detail [*module-num*]

ð Ô

module-num' /ı˘ ˩

ð ϡ Ô

ð Ô

```
Ruijie# show version module detail 2
Device  : 1
Slot    : 2
User Status :    none
Software Status:  none
Online Module :
Type    :
Ports   : 0
Version :
Configured Module :
Type    :
Ports   :
Version :
Ruijie#
```

ð ϡ Ô

ϡ	
show version slots	

72.2.2 show version slots [slot-num]

ϡ ˧˩˥˦ Æ Â

show version slots [*slot-num*]

ð Ô

num ˥˩˘ ˧˩ Â

ð ϡ Ô

ð Ô

```
Ruijie# show version slots
Dev Slot  Configured Module Online Module  User Status
Software Status
--- ----  -----------------   -----  -------------
1 1    none          none
1 2 M8606-24SFP/12GT M8606-24SFP/12GT installed none
1 3 M8606-2XFP M8606-2XFP uninstalled  cannot startup
1 4 M8606-24GT/12SFP M8606-24GT/12SFP installed ok
1 M1 M8606-CM M8606-CM                 master
1  M2                                 none
```

ð ϡ Ô

ϡ	
show version moduel detail	

73

73.1

ЛЪЮ ϡ'

- **lcd trap-number** *num*
- **memory-rate rising-threshold** *num*

73.1.1 lcd trap-number num

ϡ ↓Л Â no ϡ ↓Л Â

lcd trap-number *num*

no lcd trap-number

ð Ô

num и 1-1000 Â

ð Ô

num и 100 Â

ð ϡ Ô

ϡ Â

ð Ô

↓Л Â Ю˘ ↓Л
100 Â ϡ˘ ↓Л Â

ð Ô

ЛЪЮ ˘ 200 Â

lcd trap-num *200*

73.1.2 memory-rate rising-threshold num

ϡ Â

ð Ô

num и 1-100 Â

ð Ô

num ѝ 80Â

ð Ô

ð Ô

num ѝ 80 **show running-config** a **memory-rate rising-threshold** *80*

ð Ô

```
Ruijie(config)# memory-rate rising-threshold 60
```

74 ŕ Ş

Disk Partitions ' ׀ ש Â Э ˘ ׀ ש˘
׀ ש ˚ ѝ /dev/uba/disc0/part1˘ /mnt/uba Â ۻ ˚
ֽ cd /mnt/uba Ю˘ ׀ ש Â

74.1.2 usb remove

usb remove *Device_ID*

ð Ô

Device_ID˙ USB ʌ

ð Ô

Â

ð ֽ Ô

ð Ô

usb ˘ ֽ ˘ Л
Â ╖˘ ˘ ۻ Â
˘ USB ˘ ̈Ą
Â

ð Ô

Ю ѝ Э usb Â

```
Ruijie# usb remove 778
OK, now you can pull out the device 778.
0:1:1:38 Ruijie: USB-5-USB_DISK_REMOVED: USB Device
<USB Mass Storage Device> Removed!
```

ۻЛ usb Â

75 POE

POE ЛЬЮ ৡ'

- **Poe enable**
- **Poe-power lower lower**
- **Poe-power upper upper**
- **Poe disconnect-mode mode**

75.1

75.1.1 poe enable

ৡ ╖ Â **no** ৡ ╖ Â

poe enable

no poe enable

ð ৡ Ô

ð Ô

```
Ruijie(config-if)# poe enable
Ruijie(config-if)# no poe enable
```

75.1.2 poe-power lower lower

ৡ Â **no** ৡ ѝ Â

poe-power lower *lower*

no poe-power lower

ð Ô

lowerў ѝ ˘ 45-47

ð ৡ Ô

ð Ô

POE ӄ 46

```
Ruijie# configure
Ruijie(config)# poe-power lower 46
Ruijie(config)# end
Ruijie#
```

75.1.3 poe-power upper upper

ৡ Â **no** ৡ ӄ Â

poe-power upper *upper*

no poe-power upper

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upperď ӄ ˇ 55-57

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ð Ô

POE ӄ 56

```
Ruijie# configure
Ruijie(config)# poe-power upper 56
Ruijie(config)# end
```

75.1.4 poe disconnect-mode mode

ৡ Â **no** ৡ ӄ Â

poe disconnect-mode *mode*

no poe disconnect-mode

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modeď ӄ ˇ [ac/dc]

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POE ӄ dc

```
Ruijie# configure
```

```
Ruijie(config)# poe disconnect-mode dc
Ruijie(config)# end
```

75.2

POE Ю ৡ

- **show poe interfaces**
- **show poe powersupply**

75.2.1 show poe interfaces

ৡ POE Â

show poe interfaces *interface-id*

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ৡ ⅃Л poe

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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
```

75.2.2 show poe powersupply

ৡ POE Â

show poe powersupply

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ð Ô

```
Ruijie# show poe powersupply
PSE Total Power :1200.0 W
PSE Total Power Consumption : 0 W
PSE Available Power : 1200.0 W
PSE Peak Value : 0 W
```