RG-S3760

RGOS 10.3(5b1)



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RGOS® àRGNOS® à

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ЎĄ ˝ ѝ' RGOS®10.3(5b1) Â

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1.

' 5 Л Â

Л ╗ б Â

' Courier New ˇ ˇ 5 Лˇ
Â ÿ ˇ ╗ Â

2. ҳ

ҳ Ariaĭ έ ЊЖ Ю'

' ҳ ^ ҳ a ┘ ǂ ~ ╗ Â

' ҳ ^ ҳ ҳ ǂ ~

[ ] ' [ ] ǂ ˇ ҳ ┘ Â

{ x | y | ... }' ÿ ч ы Â

[x | y | ...] ÿ ч ↓ a Â

// ↓ ù Â

3.

ˇ

ЊЖ Ю'

~ ' à à Y Â

🕮 ' à à à 'I Â

🕮

1) ЇĄ ĭ ↓ ↓ a ˇ

2) ЇĄ ĭ ↓ ė ˇ é
ˆ /ł à ~ Л ù Â

3) ЇĄ ˇ Ę ЊЖЮ ˇ Л
Ь Â

---

1 CLI

1.1 alias

ৡ ɹˇ ɻՈ Ю alias ৡ Â
ৡ no ɻՈ ৡ ɹ Ю
ৡ ɹ Â

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

ð Ô

mode ' ɹ ৡ ৡ ৡ Â
command-alias ' ৡ ɹ Â
original-command ' ɹ ৡ ৡ Â

ð Ô

EXEC Ю˝ ϯ ৡ ɹ Â

ð ৡ Ô

ð Ô

Ю EXEC Ю ৡ ɹ Â

ৡ ɹ	ৡ
h	**help**
p	**ping**
s	**show**
u	**undebug**
un	**undebug**

ৡ ɹ a **no alias exec** ৡ Â

ৡ ɹˇ ɻՈ ৡ ৡ Â ˇ
ɹ ৡ ৡ ϯ ˇ ɻ ɻՈ ɻ ϯ Â

ɹ ৡ ৡ ৡ ৡ ˇ
Ю˝ **alias ?** ɻՈ ɻՈ ɹ ৡ '

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

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

ঀ ঃ ╠ ˘ ঃ ⁄ˆ *˜ ˘ 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 ঃ 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 ¢ Ô

¢	
show aliases	¸

1.2 privilege

¢ ¢ ˘ ¸ Л Ю **privilege** ¢ Â ¢ **no** ¸ Л ¢ ¢ и Â

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

ð Ô

mode ' ¢ CLI ¢ Â

[**all**] ' ¢ ¢ ˘ ¸ и ¸ Â

level *level* ' ¢ ¢ ˘ 0-15 Â

reset ' ¢ и Â

command-string ' ¢ Â

ð Ô

ð ¢ Ô

ð Ô

Ю ¦ **privilege** ¢ ¸ CLI ¢ ˘ a ¸ ˘ ¸ ¢ ¸ ¸ ˘ Ю ¸ Л ¢ **privilege ?** ¸ CLI ¢ Â

config	

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

ð Ô

ЛЬЮ ˘ CLI 1 ৡ й "test" ˝ **reload** ৡ ˘ ↓Л Æ Â

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

˘ 1 CLI ˘ ↓Л **reload** ৡ'

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

reload ৡ 1 ˘ ↓Л **all** '

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

˘ 1 CLI ˘ ↓Л **reload** ৡ'

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

ð ৡ Ô

ৡ	
enable secret	CLI ৡ

1.3 show aliases

ৡ ↓ ৡ Ю ৡ ↓˘ ↓Л EXEC Ю˘ **show aliases** ৡ Â

show aliases [*mode*]

ð Ô

mode ' ل ع ع ع Â

ð Ô

ð ع Ô

EXEC

ð Ô

ع ˘ ع ل Â

ð Ô

ЛЬЮ ˘ EXEC Ю ع ل'

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

ð ع Ô

ع	
alias	ع ل

2

2.1

ѝ ϟ ˆ CLI˜ ЛЬЮ ϟ'

- **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 ˘
ϟ disable Â

disable [*privilege-level*]

ð Ô

privilege-level

ð ϟ Ô

ð Ô

ϟ ÿ Â ╗ Э ˘
æ Â

disable ϡ ʌ Â

ð Ô

Ю æ '

```
Ruijie# disable 10
```

ð ϡ Ô

ϡ

~

╗ ˘ ⁄ ϡ˘ a
EXEC Âa ╗ ϡÂ
ϡÂ

ð Ô

Ю ϡй pw10'

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

ð ϡÔ

ϡ	
enable secret	ϡÂ

2.1.4 enable secret

a ⊿ ϡ˘ ϡ **enable secret** Â
ϡ **no** ϡÂ

enable secret [**level** *level*] {*secret* | [**0 | 5**] *encrypted-secret*}
no enable secret

ð Ô

Secret ' EXEC ϡÂ
Level ' Â
0|5 ' ϡ ╗ ˘ 0 ╗ ˘ 5 ╗ Â
encrypted-password ' ϡ Â

ð ϡ Ô

ð Ô

ϡ╜ й password security ϡч Âpassword й ╗ ϡ˘
й 15 ϡÂsecurity ϡй ╗ ϡ˘ ⊿Лй 0· 15
ϡÂ ˘ ⊿ ⊿ ЛЭч ϡ˘ password
ϡa Â 15 password ϡ˘ ˘
╟ й security ϡ' 15 password ϡ security
ϡ ⊿˘ ' ϡ Л╗ ˘ password
ϡ ╗ ˘ security ϡ ╗ Â

ð Ô

Ю ҳ ѝ pw10

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 ˘ ϡ **login** Â ϡ **no** ↓ ϡ Â

login

no login

ð Ô

Â

ð ϡ Ô

line

ð Ô

AAA Ь˘ ϡ ϡ Â ϡ VTY console ϡ Â

ð Ô

Ю VTY Э ϡ Â

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

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

password	line

2.1.8 login local

AAA

login local **no**

login local

no login local

line

AAA

username

VTY

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

ð Ô

default ' ɻ

list-name ' ɻ ɻ

ð ϡ Ô

line

ð Ô

AAA Ŀ ϡ 8
Â

ð Ô

Ю VTY Э radius Â

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

ð ϡ Ô

ϡ	
aaa new-model	AAA Ŀ
aaa authentication login	

2.1.10 username

ɻ˘ ϡ username Â

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

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

no username *name*

ð Ô

name ' ɻ Â

password ' ϡ Â

0|7 ' ϡ ╗ ˘ 0 ╗ ˘ 7 ╗ Â

encrypted-password ' ϡ Â

privilege-level ' Â

ð ϡ Ô

ð Ô

ৡ ˘ Â

~

╗ ѝ 7˝ ѝ Â

╗ ѝ 7Â Ю˘ ⁸ ╗

ৡ ˘ ╗ ѝ 7Â

ð Ô

Ю ɻ ৡ˘ ѝ 15 '

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

ð ৡ Ô

Э в ╖ ˘ line Ю
lockable ʒ˘ line Э в Â

ð Ô

Ю й в '

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

ð ʒ Ô

ʒ	
lockable	Э в Â

2.1.12 lockable

Э **lock** G!5ʒÞ➢┘Л lockable

```
Again: <password>
Locked
Password: <password>
Ruijie#
```

ð ϡÔ

ϡ	
lock	в Â

2.1.13 telnet

ل telnet Ł ˘ EXEC˘ ˜ Ю˘
telnet ϡ Â

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

ð Ô

Host' ў IP ў ل'

Port' TCP Л˘ й 23'

Keyword' ل ˘ Ю '

/source-interface	ÿ telnet '
/vrf	VRF

ð ϡ Ô

ð Ô

ϡ ل telnet Ł Â

ð Ô

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

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

ð ϡÔ

ϡ	

Show session	TTY ’
exit	’

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

ð Ô

ð Ô

no enable service

ð Ô

Ю **enable service ssh-server**, SSH Server

```
Ruijie(Config)# enable service ssh-server
```

ð Ô

show service

˘ ˩ Л∪ ϡ **clock set** ч

'

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

ð Ô

hh:mm:ss ' ˘ й ^ 24 ⁸˜ : ϯ :

day ' ^ 1-31˜ ˘ Â

month ' ^ 1-12˜ ˘

year ' Ѽ ^ 1993-2035˜ ˘ a Â

ð ϡ Ô

ð Ô

ϡ ˘ Â

˚ ˘ clock set Э

˘ Ю Л˘ Â

ð Ô

Ю й 2003 3 17 Э ' 10 20ϯ 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 ˚ clock˘ privileged EXEC Ю **clock update-calendar** ϡ˘ ˚ clock ˚ clock Â

clock update-calendar

ð Ô

ϡ ˚ ˆ calendar˜ ˙I ˚ ˘ ˚ a
˘ ϶ ˚ ˘ Ю ≠
Â

˚ ˚ a ϡ ˘ ˚ ˘ ϡ
˚ 8 ˚ Â

ð Ô

Ю ϡ ϟ Л υ ˚ clock 8 ˚ clock Â

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

ð ϡ Ô

ϡ	
clock read-calendar	˚ ˚

2.2.3 exec-timeout

LINE Ю ˘ **exec-timeout** ϡ Â
no exec-timeout ϡ˘ ϡ LINE Ю ˘ a Â

exec-timeout *minutes* [*seconds*]

no exec-timeout

ð Ô

minutes˙ ˙ ’

seconds˙ ˆ ϟ ˜ ’

ð Ô

϶ 10 min Â

ð ϡ Ô

LINE

ð Ô

˘ ˘ ˘

LINE ϶ ϟ Â

ð Ô

Ю line vty 0 ϶ 5˙ 30 ˛˙

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

2.2.4 hostname

ð Ô

Ю line vty 0 ѝ 5↑ 30 :'

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

2.2.6 show clock

˘ ϡ **show clock** Â

show clock [**detail**]

ð Ô

detail Â

ð ϡ Ô

ð Ô

ϡ ↓Л˘ ˘ detail Â

ð Ô

Ю **show clock** ϡ '

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

ð ϡ Ô

ϡ	
clock set	

2.2.7 show running-config

˘ ϡ **show running-config** Â

show running-config

ð ϡ Ô

2.2.8 show startup-config

NVRAM ˇ Э ˘
show startup-config Â

show startup-config

ð Ô

ð Ô

NVRAMˆ ˇ ~ Э
startup-config ˙ ╠ Â

2.2.9 reload

˘ **reload** Â

reload [*text* | **in** *mmm* | *hhh:mm* [*text*] | **at** *hh:mm month day year* [*text*] | **cancel**]

ð Ô

text ' ˘ 1-255 Â
in *mmm* | *hhh:mm* ' ˇ
at *hh:mm month day year*' ˘ a 200
month ' ˘ ÿ 1 12
day ' % m گ ˜ ط
â Ô ˩ ╠
´ ˜ Â ˺ ╕ '

show reload

ð Ô

ð Ô

ð Ô

Â

ð Ô

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

2.2.11 prompt

Â **prompt** Â **no prompt** Â

prompt *string*

ð Ô

string 32

ð Ô

ð Ô

EXEC Â

ð Ô

rgos

Ruijie(config)# **prompt** *rgos*
Ruijie(config)# **end**
rgos

2.2.12 banner motd

˘ Ю ʒ **banner motd** Â
ˬ ˘ **no banner motd** ʒ Â

banner motd *c message c*

ð Ô

c ' ˚ ˘ a

message '

ð ʒ Ô

ð Ô

ʒ ˬ Л˘ ˘ ˘
Â ˚ ˬ Ÿ ˘
Â

ð Ô

Ю '

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

2.2.13 banner login

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

banner login *c message c*

ð Ô

c ' ˚ ˘ a
message '

ð ʒ Ô

ð Ô

ʒ ˬ Л˘ ˘ ˘
Â ˚ ˬ Ÿ ˘
Â

ð Ô

Ю '

```
Ruijie(config)
```

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

2.2.14 speed

speed *speed*

no speed

speed *speed*

Speed

ð Ô

ð Ô

Â

ð Ô

console

```
Ruijie# show line console 0
CON     Type    speed   Overruns
 0 CON0 9600/9600 1/0 0/0
Stop rx interrupt: 0 times
Modem: 5.7(45)27TT5 1 Tf01.9780 0 10.97800 7409.823 Tm0
```

× · ₨ Ṛ i

3 LINE

3.1 LINE

3.1.1 line

LINE ˘ ЛuЮ ¯'

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

ð Ô

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

ð Ô

ð ¯ Ô

ð Ô

LINE

ð Ô

LINE VTY 1 3 LINE '

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

ð ¯Ô

3.1.2 line vty

¯ ┘Л ╗ ┘Л VTY Â ¯ **no** ┘Л ┘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

access-list-number	access-list Нѫ 8 Â
in	↓ 8 Â
out	8 Â

ð Ô

˘ Line Ю 8 Â ˘ Â

ð ¾ Ô

Line

ð Ô

¾ Line Ю 8 Â Ю ↓ б ˘ a Â **access-class Л˘** access list ˘ ↓Л ╖ Â **show running** ¾ Line Ю Â

ð Ô

line vty 0 4 Ю˘ ↓ access-list и 10

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

ð ¾Ô

¾	
show running	Â

ð Ô

˚ RGOS10.1 Л Э

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*

~

Э

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

ð Ô

filename' Э

ð Ô

Â

ð Ô

ð Ô

Xmodem Â Â

Ю : ÿ ў xmodem ,

γ Э xmodem Э ў Â

ð Ô

Ю Э Ю :

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

5

5.1

IP ˘ ˘ ¦!Ľ˘ ˘
¦.Ľ˘ ⊿ Â ping ╖ ˘
Ю ˘ ping ˘ ⊣Л ã ˘
˘ ping ╖ ˘ ⊿ ≠ Â
⊣ ╖ ˘ ”I ⊣ ┺ ˘ é DNS
ǂ Â

ð Ô

ping '

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

ping '

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

ð ⊿ Ô

ϡ Э Â

5.1.2 traceroute

traceroute ϡ˘ ⊣Л ÿ

.

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

ð Ô

vrf-name	VRF ⊿
Ip-address	IPv4 Â

number	
source-address	IPV4
seconds	
minimum maximum	TTL

ð ϡ Ô

ð Ô

traceroute ϡ ў ˘ ˘
Æ Æ Â ˩ ╖ ˘ ″I ˩ Ŀ ˘ é
DNS ϯ Â

ð Ô

ЛЮ й traceroute ч ˘ й ˘ й
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
```

ў Э ˘ ˩Л ˘ ў IP й 61.154.22.36
ў ˘ ^ 1˙ 6˜ ˘ ˩
˘ ϯ ˘ 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 ˘ ٬ Л৬ ˘ 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 ٧ Ô

ٶ Э Â

6

6.1

ЛЬЮ ٣'

- **interface aggregateport**
- **interface fastEthernet**
- **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

٣ ٣˘ ˘
Â ٣ no Â

interface aggregateport *port-number*

ð Ô

port-number ' Aggregate port Л˘ ¤ Â

ð ٣ Ô

ð Ô

ɻ Ʌʊ ˇ è ╗ aggregate port Âaggregate port ѝ ˇ

aggregate port ᾱ Â **show interfaces show interfaces aggregateport** ꝛ Â

ð Ô

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

ð ꝛ Ô

ꝛ	
show interfaces	Â

6.1.2 interface fastEthernet

ꝛ ꝛˇ Ʌʊ ˇ Â

interface fastEthernet *mod-num/port-num*

ð Ô

mod-num/port-num ʌ / Ɔ ʌˇ ᾱ Â

ð ꝛ Ô

ð Ô

ꝛ no ˇ a Â **show interfaces show interfaces fastEthernet** ꝛ

ð Ô

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

ð ꝛ Ô

ꝛ	
show interfaces	Â

6.1.3 interface giagbitEthernet

ꝛ ꝛˇ ”ɪ Ʌʊ ˇ Â

interface gigabitEthernet *mod-num/port-num*

ð Ô

mod-num/port-num ' Л / Э Л˘

ϡ	
show interfaces	Â

ð ⊿ Ô

6.1.5 medium-type

Â ϡ **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

⊿ ⊣ Л∪ ″I ч ˘ è Â

⊿˘ ˘ à ⊣ à ⁸

˘ Â ⊿ ⊿˘

ŭ è ˘ ⊣ Л∪ Â

ð Ô

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

ð ϡ Ô

ϡ	
show interfaces	Â

ð ⊿ Ô

ɹ Â ৡ no .

description *string*

no description

ð Ô

string ' ɹ Â

ð Ô

ɹ Â

ð ৡ Ô

ð Ô

show interfaces ৡ ˘ ɹ Â

ð Ô

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

ð ৡ Ô

ৡ	
show interfaces	Â

6.1.7 shutdown

˘ ৡ Â ৡ **no**

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 ʒ Ô

ʒ	
clear interface	˚ Æ Â

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

ð ϡ Ô

ϡ	
show interfaces	Â

6.1.9 duplex

ЮЎ ϡ ┤ Â ϡ **no**
ѝ

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

no duplex

ð Ô

auto' ┤ ┤ Â
full ' ┤ Â
half' ┤ *Â*

ð Ô

┤ ┤ Â

ð ϡ Ô

ð Ô

┤ б Â ┤Л **show interfaces** ϡ
┤ Â

ð Ô

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

ð ϡ Ô

ϡ	
show interfaces	Â

6.1.10 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

6.1.11 mtu

mtu

Mtu *num*

ð Ô

num' 64 9216(65536 a ↓ a ↓)

ð Ô

ѝ 1500 Â

ð ϡ Ô

6.1.13 clear counters

clear counters [*interface-id*]

ð Ô

interface-id Â

ð Ô

ð Ô

show interfaces **clear counters** Â a Â

ð Ô

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

ð Ô

show interfaces	Â

6.1.14 clear interface

clear interface *interface-id*

ð Ô

interface-id Â

ð Ô

ð Ô

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

ð Ô

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

ð ϡ Ô

ϡ	
shutdown	Â

6.1.15 switchport

Ю a **switchport** ϡ˘
ѝ 2 Â a **no switchport** ϡ
ѝ 3

switchport

no switchport

ð Ô

Ю 2 Ю Â

ð ϡ Ô

ð Ô

ϡ Âswitchport ϡ
˘ Â
ÿ 2 ˛ 3 ˘ 2 Â

ð Ô

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

ð ϡ Ô

ϡ	
show interfaces	Â

ð ϡ Ô

6.1.16 switchport mode

ϡ γ ˆ switch port˜ ˘ ϡ Л υ ѝ
access port ѝ trunk port, ѝ 802.1Q Â ϡ **no**
ѝ Â

switchport mode {**access | trunk**}

no switchport mode

ð Ô

access	switch port ù access port Â
trunk	switch port ù trunk port Â

ð Ô

switch port ù access

ð Ô

ð Ô

switch port access˘ ù VLAN

Â ¸

ð ϡ Ô

ð Ô

VLAN ID Â VLAN ID˘
VLAN˘ ѝ VLAN Â
VLAN ID˘ ╗ VLAN Â

trunkport˘

ð Ô

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

ð ϡ Ô

ϡ	
switchport mode	γ ˆ switch port˜ Â
switchport trunk	ѝ trunkport native VLAN Trunk ┘ VLAN Â

6.1.18 switchport trunk

ѝ trunkport native VLAN Trunk ┘ VLAN Â ϡ no trunk ѝ Â

switchport trunk {allowed vlan {all | [add | remove | [Tc79Tw({)Tj/]TT2 1 TfD(

native vlan *vlan-id*	Native VLAN Â

ð Ô

ɹ VLAN allʳ Native VLAN VLAN 1

ð Ô

ð Ô

Native VLANʳ

ỳ Trunkʳ native VLAN Â native VLANʳ
Э UNTAG ˇ ỳ VLAN Â
ˇ VLAN ID IEEE 802.1Q PVIDˆ native
VLAN VLAN ID Â ɹ ˇ Trunk Э native VLAN ˇ
UNTAG Â

ɹ VLAN '

Trunk ɹ Л∪ VLANÑ 1˙ 4094ˆ Â
ˇ ≠ ɹ Л∪ Trunk ɹ VLAN ⁸ VLAN
a Trunk Â

show interfaces switchport ʒ Â

ð Ô

Ю VLAN 2 ÿ 1/15 ' Ä

6.1.19 snmp trap link-status

ৎ Л৬ LinkTrapৼ ৷৷ ৼ
Link ৎ ৼ SNMP LinkTrap, ৎ a Â
ৡ **no** SNMP a LinkTrap Â

snmp trap link-status

no snmp trap link-status

ð Ô

Юৼ ৷৷ ৼ Link ৎ ৼ SNMP
LinkTrap Â

ð ৡ Ô

ð Ô

ˆ Л৬ à Ap à SVI ˜ ˘ ৡ
LinkTrapৼ ৷৷ ৼ Link ৎ ৼ SNMP
LinkTrap, ৎ a Â

ð Ô

Ю ù a Link trap৾

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

Ю ù Link trap৾

```
Ruijie(config)# interface gigabitEthernet 1/1
Ruijie(config-if)# snmp trap link-status
```

ð ৡ Ô

ৡ	
Ruijie(config-if)# **snmp trap link-status**	link trap ৷৷ .
Ruijie(config-if)# **no snmp trap link-status**	link trap ৷৷ .

6.2

6.2.1 show interfaces

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

ð Ô

interface-id ' ˆ Ɲ à aggregateport à SVI à loopback ~

counters ' Â

description ' ˘ link Â

status ' γ ˘ à ㄱ Â

switchport ' γ ˘ γ Â

trunk ' trunking port ˘ à Aggregate port Â

ð Ô

Â

ð ৡ 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 ৡ Ô

shutdown	Â
speed	Â
switchport priority	802.1q ″I Â
switchport protected	и Â

7 Aggregate Port

7.1

7.1.1 port-group

ù Aggregate Port Â ¸ no
Aggregate Port Â

port-group *port-group-number*

no port-group

ð Ô

a Aggregate Port

ð Ô

ð Ô

src-dst-ip	IP б IP ¦ Â a ⊿ IP—— IP a ⊿ ˘ ⊿ IP—— IP ⊿ Â Ь ˚ Ю˘ Â
src-dst-mac	MAC б MAC ¦ Â a ⊿ MAC—— MAC a ⊿ ˘ ⊿ MAC—— MAC ⊿ Â

load-balance	aggregaye port Â
summary	aggregate port Â

ð ¾ Ô

ð Ô

aggregate port /\˘ aggregate port

ð Ô

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

ð ¾Ô

¾	
aggregateport load-balance	AP Â

8 LACP

8.1

8.1.1 lacp port-priority

LACP ″I Â ३ no Â

lacp port-priority *port-priority*

no lacp port-priority

port-priority	″I Â ↓ и 0-65535

″I и 32768 Â

३ Â

,

8.1.2 port-group mode

LACP ID Л Â ꝛ no ⊬
б LACP Â

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

no port-group

Key	ID, key ⊬ a ⊿ a ⊿ ⊿ Â
active	ў ╟ LACP Â
passive	a ў ╟ LACP ˘ LACP Л ╟ б LACP .

a б LACP Â

ꝛ Â

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

ꝛ	
lacp port-priority	LACP ″I Â

⊬

Л	
-	-

8.1.3 lacp port-priority

LACP ″I Â ꝛ no Â

lacp port-priority *port-priority*

no lacp port-priority

LACP

Â

"I '

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

³	
port-group *key* **mode**¸ **active** | **passive** **port-group** *key* **mode**	LACP ID Â
lacp port-priority	LACP "I

ƒ

³ ƒ	ƒ	
	-	-

8.2

- show lacp summary

8.2.1 show lacp summary

LACP Â

show lacp summary

-	-

³ Â

```
Ruijie# show LACP summary
Flags:S - Device is sending Slow LACPDUs   F - Device is sending fast
LACPDUs.
A - Device is in active mode.   P - Device is in passive mode.
Aggregate port 3:
```

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 ¼ Ô

9.1.2 name

VLAN ¼ Â ¾ **no** Â

name *vlan-name*

no name

ð Ô

vlan-name	VLAN ৶

ð Ô

VLAN ৶

ð ৡ Ô

VLAN

ð Ô

show vlan ৡ vlan

ð Ô

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

ð ৡ Ô

ৡ	
show vlan	VLAN Â

9.1.3 switchport mode

ৡ γ ˆ switch port˜ ˇ ৸ Л∪ ϶ access port ϶ trunk port, ϶ 802.1Q Â ৡ 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 ৡ Ô

VLAN 3

VLAN ID Â VLAN ID˘
VLAN˘ ù 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	ù trunkport native VLAN Trunk ┘ VLAN Â

9.1.5 switchport trunk

ù trunkport native VLAN Trunk ┘ VLAN Â ¾ **no** trunk ù 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 ┘Ω VLAN˘ ≠ ┘Ω VLAN˘

allowed vlan *vlan-list*

ð Ô

৶ VLAN allˇ Native VLAN VLAN 1

ð ৡ Ô

ð Ô

Native VLANˈ

ὶ Trunkˇ native VLAN Â native VLANˇ
Э UNTAG ˘ ὶ VLAN Â
˘ VLAN IĐ IEEE 802.1Q PVIDˇ native
VLAN VLAN ID Â ৶ ˘ Trunk Э native VLAN ˘
UNTAG Â

৶ VLAN '

Trunk ৶ Л৬ VLANÑ 1¨ 4094˜ Â
˘ ≠ ৶ Л৬ Trunk ৶ VLAN ⁸ VLAN
a Trunk Â

show interfaces switchport ৡ 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 ৡ Ô

ৡ	

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

¾ VLAN ù **supervlan** Â

Vlan-id-list	VLAN subvlan ID, ↲ vlan

VLAN

no subvlan supevlan subvlan

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

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 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 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
```

ð ¾Ô

ð ¼ Ô

11 Protocol VLAN

11.1

- **protocol-vlan profile** *num* **frame-type** [*type*] **ether-type** [*type*]
- **protocol-vlan profile** *num* **vlan** *id*

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

Л profile

ð Ô

num ' profile

type ' Л

ð Ô

ð ¢ Ô

ð Ô

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

ð ¢Ô

show protocol-vlan profile

show protocol-vlan profile *num*

no protocol-vlan profile

no protocol-vlan profile *num*

ð Ô

˚ RGOS10.1 ЛЭ

11.1.2 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*

ð ¼ Ô

˚ RGOS10.1 Л Э

11.2

- **show protocol-vlan**

11.2.1 show protocol-vlan

Protocol VLAN

show vlan protocol-vlan

ð Ô

ð Ô

ð ¾ Ô

ð Ô

```
Ruijie# show protocol-vlan
```

ð ¼ Ô

RGOS10.1

12 PrivateVLAN

12.1

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

12.1.1 private-vlan type

VLAN 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 ʒ Ô

VLAN

ð Ô

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

ð ʒ Ô

show vlan private-vlan

ð ʌ Ô

˚ RGOS10.1 Лъ Э

12.1.2 private-vlan association

secondary VLAN б primary VLAN ҃

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

no private-vlan association

ð Ô

svlist ' й secondary VLAN list

no ' ы primary VLAN б secondary VLAN

ð Ô

ð ҃ Ô

Primary VLAN

ð Ô

```
Ruijie(config)# vlan 22
Ruijie(config-vlan)# private-vlan association add
24-26
```

ð ҃Ô

show vlan private-vlan

ð ы Ô

˚ RGOS10.1 Л Э

12.1.3 private-vlan mapping

secondary VLAN Ь SVI ҃

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

no private-vlan mapping

ð Ô

svlist ' secondary VLAN list

no '

ð Ô

ð ҃ Ô

Primary VLAN

ð Ô

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

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

ð ʒ Ô

show vlan private-vlan

ð ʌ Ô

˚ RGOS10.1 Л Э

12.1.4 switchport mode private-vlan

ѝ private VLAN

switchport mode private-vlan{**host**|**promiscuous**}

no switchport mode

ð Ô

host ' VLAN ў

promiscuous ' VLAN

no ' VLAN

ð Ô

ð ʒ Ô

ð Ô

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

ð ʒ Ô

show vlan private-vlan

ð ʌ Ô

˚ RGOS10.1 Л Э

12.1.5 switchport private-vlan host-association

private VLAN ў primary VLAN secondary VLAN

switchport private-vlan host-association *p_vid s_vid*

no switchport private-vlan host-association

ð Ô

p_vid ' primary VID

s_vid '

show vlan private-vlan

ð ✓ Ô

˚ RGOS10.3(5)Л Э

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 ' ✓ secondaryVLAN

ð Ô

ð ֽ 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 ֽ Ô

show vlan private-vlan

ð ✓ Ô

˚ RGOS10.1 Л Э

Ö

private VLAN

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

ð Ô

primary ' primary VLAN

community ' community VLAN

isolated ' isolated VLAN

ð Ô

ð ֳ Ô

ð Ô

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

ð ˽ Ô

˚ RGOS10.1 Л Э

12.3 Hybrid

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

12.3.1 switchport mode hybrid

switchport mode hybrid

no switchport mode

й hybrid

ð Ô

no ' hybrid

ð Ô

ð ֳ Ô

ð Ô

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

ð ✓ Ô

˚ RGOS10.1 Л Э

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

ð ✓ Ô

RGOS10.1 Л Ъ Э

13 MAC

13.1

ЛЪЮ ٦

- **mac-address-table aging-time**
- **clear mac-address-table dynamic**
- **clear mac-address-table filtering**
- **clear mac-address-table static**
- **mac-address-table static**
- **mac-address-table filtering**
- **mac-address-table notification**
- **snmp trap mac-notification**
- **address-bind**
- **address-bind uplink**
- **address-bind install**
- **address-bind ipv6-mode**

13.1.1 mac-address-table aging-time

╟ Â ٦ 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 ٦ Ô

ð Ô

show mac-address-table aging-time ٦ Â

show mac-address-table dynamic ٦ ╟ 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

13.1.2 clear mac-address-table dynamic

╟ Â

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

ð Ô

dynamic	╟ Â
address *mac-addr*	╟ Â
interface *interface-id*	╟ Â
vlan *vlan-id*	VLAN ╟ Â

ð ¾ Ô

ð Ô

┘Л **show mac-address-table dynamic** ¾ ╟

ð Ô

╟

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

ð ¾Ô

¾	
show mac-address-table dynamic	╟ Â

13.1.3 clear mac-address-table filtering

MAC 3

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

ð ¾ Ô

ð Ô

¬Л **show mac-address-table static** ¾

ð Ô

Ю MAC й 00d0.f800.073c '

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

ð ¾Ô

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

13.1.5 mac-address-table static

Â ¾ **no** Â

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

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

ð Ô

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

ð Ô

Â

ð ¾ Ô

ð Ô

a Æ
≠ a Â a ù Â **show mac-address-table static** ¾ **clear mac-address-table static** ¾

ð Ô

Ю 00d0.f800.073c VLAN 4
ل ù
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 ل Ô

13.1.6 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 ½ Â **show mac-address-table filtering** ¾ Â

ð Ô

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

ð ¾ Ô

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

13.1.7 mac-address-table notification

MAC ¶ Â ¾ **no** ¶ Â

mac-address-table notification [**interval** *value* | **¦ize Tw( ])Tj/TT55.0.43.92 ref174.96 6e**

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

ð ¾Ô

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

13.1.8 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

ð Ô

show mac-address-table notification *interface* ¾ Â

ð 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

13.1.9 address-bind

ip mac .

address-bind *ip-address mac-address*

no address-bind *ip-address*

ð Ô

ip-address	IP Â
	mac Â

ð ¾ Ô

ð Ô

MAC ˘ IP
MAC a ˙ IP
l

intf-id	й

ð ʒ Ô

ð Ô

IP MAC ˘
IP й IP ˘ MAC a й IP
MAC ˘ ˘ й ˘ з

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

ð ʒ Ô

ʒ	
show address-bind uplink	

ð ʌ Ô

RGOS10.1 ЛЪЭ

13.1.12 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 ѐ ˘ Ю '

	Ipv 4	**IPV 6**

a ipv6 ~ Â	IPV4+MAC. Â	ш
IPV6 Â	IPV4+MAC. Â	

		M A C ѝ
		I P V 4 + M A C ˘
		M A C I P V 6 Â

ð Ô

˘ IP ѝ 192.168.5.2 ѝ 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
```

13.2

ЛЪЮ ʒ

- **show mac-address-table address**

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

13.2.1 show mac-address-table address

MAC ^ ╠ ˇ ~ Â

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

ð Ô

address *mac-addr*	MAC Â
interface *interface-id*	/1
vlan *vlan-id*	VLAN /1

ð ¾ 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

13.2.2 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

13.2.3 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 ३ Ô

३	
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

```
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

13.2.5 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

¾	
clear mac-address-table filtering	Â
mac-address-table filtering	Â

ð Ô

interface-id	(⅃ Л∪ AggregatePort) Â
vlan-id	VLAN Â

ð ৡ Ô

ð Ô

```
Ruijie# show mac-address-table interface
gigabitethernet 1/1
Vlan       MAC Address         Type     Interface
------  ---------------       -----    -----------
1     00d0.f800.1001  STATIC   gigabitethernet 1/1
1     00d0.f800.1002  STATIC   gigabitethernet 1/1
1     00d0.f800.1003  STATIC   gigabitethernet 1/1
1     00d0.f800.1004  STATIC   gigabitethernet 1/1
```

ð ৡ Ô

ৡ	
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 vlan	VLAN Â
show mac-address-table count	Â

interface *interface-id*	ʌ Â Ɔ MAC ȶȶ Â
history	MAC ɻ Â

ð Ô

MAC ȶȶ

mac-addr MAC Â

```
1    00d0.f800.1002   STATIC   gigabitethernet 1/1
1    00d0.f800.1003   STATIC   gigabitethernet 1/1
```

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 address	Â
show mac-address-table interface	Â
show mac-address-table count	Â

13.2.10 show address-bind

Â

show address-bind

ð ¾ Ô

ð Ô

ð Ô

```
Ruijie# show address-bind
IP Address      Binding MAC Addr
-----------     -----------------
3.3.3.3         00d0.f811.1112
3.3.3.4         00d0.f811.1117
```

ð ¾Ô

¾	
address-bind	Â

14 DHCP Snooping

14.1 DHCP snooping

DHCP snooping Ю ¾ ЛuЮ '

- **ip dhcp snooping**
- **ip dhcp snooping vlan**
- **ip dhcp snooping bootp-bind**
- **ip dhcp snooping ver7ty mac-address**
- **ip dhcp snooping information option**
- **ip dhcp snooping database write-delay**
- **ip dhcp snooping database write-to-flash**

14.1.1 ip dhcp snooping

DHCP Snooping ╖ ˘ Ю ¾ Â
¾ no ˘ DHCP Snooping ╖ Â

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

ð Ô

ð Ô

╖

ð ¾ Ô

ð Ô

DHCP Snooping ╖ Л˘ ┘Л **show ip dhcp snooping**
¾ DHCP snooping ╖ Â

~

DHCP Snooping б Private VLAN ╖ a Â

ð Ô

Ю DHCP snooping ╖ '

```
Ruijie# configure terminal
```

DHCP Snooping

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

ð ¾Ô

¾	
ip dhcp snooping	DHCP Snooping

14.1.3 ip dhcp snooping bootp-bind

DHCP Snooping Bootp ¶ ˇ ЮО ¾Â ¾ no ˇ DHCP snooping Bootp ¶ Â

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

ð Ô

ð Â Ġ ⊁

¾	
show ip dhcp snooping	DHCP snooping

14.1.4 ip dhcp snooping verify mac-address

MAC ╖ ˘ ЮO ¾ Â
¾ no ˘ MAC ╖ Â

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

ð Ô

ð Ô

╖

ð ¾ Ô

Â

ð Ô

MAC ╖ ˘ DHCP CLIENT ˘
MAC DHCP CLIENT MAC ⅄ Â
MAC ˘ Â

ð Ô

ЮO 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

14.1.5 ip dhcp snooping information option

Ъ Ђ Â Ю ˇ a

ð ¢ Ô

ð Ô

¢˘ ↓Л DHCP Snooping ╟
FLASH ˚ Â

ð Ô

Ю DHCP ╟ flash '

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

ð ¢ Ô

14.2 DHCP snooping

DHCP snooping Ю ¢ ЛЮ '

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

14.2.1 ip dhcp snooping suppression

й suppression ˘ Ю ¢ Â
¢ no ˘ й no suppression Â

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

ð Ô

ð Ô

Т

ð ¢ Ô

ð Ô

¢˘ ˩ Ю DHCP ˘
Ю DHCP Â

ð Ô

Ю **fastethernet** *0/2* и suppression '

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

ð ¢Ô

14.2.2 ip dhcp snooping trust

DHCP snooping и TRUST ˘
Ю ¢Â ¢ no ˘ и UNTRUST Â

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

ð Ô

ð Ô

Ю˘ и UNTRUST

ð ¢ Ô

ð Ô

¢˘ DHCP Ł и TRUST Â
TRUST DHCP ˘ UNTRUST
DHCP Â

ð Ô

Ю **fastethernet** *0/1* и TRUST '

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

```
DHCP snooping option 82 status: ENABLE
DHCP snooping Support Bootp bind status: ENABLE
Interface                 Trusted    Rate limit (pps)
------------------------  -------    ------------
FastEthernet0/1            YES         unlimited
```

ð ¾Ô

¾	
show ip dhcp snooping	DHCP snooping

```
DHCP snooping database write-delay time: 0 seconds
DHCP snooping option 82 status: ENABLE
DHCP snooping Support Bootp bind status: ENABLE
Interface                  Trusted    Rate limit (pps)
-------------------------  -------    ------------
FastEthernet0/1             NO         100
```

ð ¾Ô

¾	
show ip dhcp snooping	DHCP snooping

14.3 DHCP snooping

- **show ip dhcp snooping**
- **show ip dhcp snooping binding**

14.3.1 show ip dhcp snooping

DHCP Snooping ˘ ЮО ¾ Â

show ip dhcp snooping

ð Ô

ð Ô

ð ¾ Ô

ð Ô

¾˘ ˩Л DHCP Snooping Â

ð Ô

ЮО 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)
```

```
-----------------------    -------     -----------
```

ȍ ʒ Ô

ʒ	
ip dhcp snooping	opin6

ip dhcp snooping binding	DHCP snooping
clear ip dhcp snooping binding	DHCP snooping ╠

14.4 DHCP snooping

è DHCP Snooping ٪ ЛьЮ '

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

14.4.1 clear ip dhcp snooping binding

DHCP Snooping ╠ ˘ Ю
٪ Â

clear ip dhcp snooping binding

ð Ô

ð Ô

ð ٪ Ô

ð Ô

٪˘ ٧Л DHCP snooping ╠ Â

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 ٪Ô

٪	
show ip dhcp snooping binding	DHCP snooping

14.4.2 debug ip dhcp snooping

Э DHCP Snooping ╖ ˘ Ю
¥ Â

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

ð Ô

ð Ô

ð ¥ Ô

ð Ô

¥˘ DHCP snooping ╖ Â

ð Ô

Ю DHCP snooping '

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

ð ¥ Ô

15 IGMP Snooping

15.1

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 dyn-mr-aging-time**
- **ip igmp snooping query-max-response-time**
-

profile-number	profile Л˘ 1-65535

ð Ô

Â

ð ٪ Ô

Â

ð Ô

IGMP Profiles Э ˘ l' SVGL
Ŀ à l' Ŀ à l' IGMP Filtering Ŀ
Ћ Â ˘ ѝ profile ˘ profile Ћ
Â

ð Ô

Ю Л ѝ 1 profile profile Â

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

ð ٪ Ô

٪	
range	profile

15.1.2 range

profile ˘ profile ˘ profile
Ю ٪ range˘ ┘Л ˘ ≠ ┘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 ٪ Ô

profile Â

ð Ô

low-ip-address high-ip-address ˘ Л˘
ий˘ profile ий 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 ֳ Ô

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

15.1.3 deny

profile ˘ profile Ю ֳ
deny Â

deny

ð Ô

Â

ð Ô

profile deny Â

ð ֳ Ô

profile Â

ð Ô

˝I profile Ю range ֳ Â

ð Ô

Ю 233.3.3.3 profile :

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

ð ৡ Ô

ৡ	
ip igmp profile	profile
range	

15.1.4 permit

profile ’

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
ﻝ VLAN ,
VLAN ˘ ﻝ 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

15.1.6 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

ð Ô

disable Â

ð ৡ Ô

Â

ð Ô

ÞÕ VLAN ₴4 ў >

ip igmp snooping dyn-mr-aging-time ╟
ˇ **no ip igmp snooping dyn-mr-aging-time** Â

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

no ip igmp snooping dyn-mr-aging-time

ð Ô

num	╟ ˇ ↓ ѝ 1-3600 Æ ѝ Â

ð Ô

300s

ð ֽ Ô

Â

ð Ô

╟ è IGMP
PIM Hello ˇ ÿ Â

ð Ô

Ю ╟ ѝ 500s

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

ð ֽ Ô

15.1.10 ip igmp snooping query-max-response-time

ip igmp snooping query-max-response-time IGMP
- Ч ضض ę

ð

Â

ð Ô

IGMP Л˘
˘ ѝ ˘ ѝ 0 ˘
ѝ a Ѧ ˘ γ ÿ IGMP
Snooping Â

IGMP Л˘
╟ ˘ ѝ ˘ ѝ 0
˘ ѝ a Ѧ ˘ ÿ
IGMP Snooping Â

IGMPv3 ˘ a Â

ð Ô

Ю IGMP ѝ 15s

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

ð ֳ Ô

15.1.11 ip igmp snooping vlan mrouter learn pim-dvmrp

╟ IGMP Query à DVMRP Probe
PIM ˘ Лυ ╟ ˘ ֳ **ip igmp snooping vlan mrouter learn pim-dvmrp** Â ֳ 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 ˘ ↓ ѝ VLAN ID

ð Ô

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ð ֳ Ô

Â

ð Ô

б è Â
Ю˘ VLAN ╟ ˘ ┘Л
VLAN ╟ ˘ ╥ ˘ no ֳ ╟
˘ ˘ ╟ ˘ Â ˘
ÿ ˘ Ѧ
' ÿ ѝ ˘ Â
╥ Ю˘ ╟ ˘ ˘ ┘Л igmp
snooping Â

ð Ô

Ю ╟ ˘ ╥ '

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

ð ֳ Ô

ֳ	
ip igmp snooping vlan mrouter interface	

15.1.12 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

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ð ֳ Ô

Â

ð Ô

┘Л Э ѝ ˘ ÿ Э
IP ┘Л Â
Ю˘ ÿ ˘ è Â

ð Ô

Ю '

٦	
ip igmp snooping vlan mrouter interface	

15.1.14 ip igmp snooping fast-leave enable

igmp snooping fast-leave˘ ٦ **ip igmp snooping fast-leave enable**Â ٦ no igmp snooping fast-leave Â

ip igmp snooping fast-leave enable

no ip igmp snooping fast-leave enable

ð Ô

Â

ð Ô

Sa@@ ‘ WÄ¹ Â

Ô ي صلى

no ip igmp snooping suppression enable

ð Ô

Â

ð Ô

disable Â

ð ৡ Ô

Â

ð Ô

IGMP ⁸ ╖ ⅄˘

vlan IGMP

Report ˘ ⅄ IGMP Report a

˘ ⅃ Л Ѽ ď

ð Ô

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ð ¯ç Ô

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ð Ô

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ð Ô

ÞO ¶¨ IP Â

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

ð ¯ç Ô

¯ç	
ip igmp snooping source-check default-server	IP ¸Ì IP

15.1.17 ip igmp snooping filter

˘ ÞO ¯ç

D ^ s ñ ü Ð profile Â **1** ¯ç no ¨ **S** profile Â

ð Ô

Ю 0/1 Э profile 1'

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

ð ৡ Ô

ৡ	
ip igmp profile	profile

15.1.18 ip igmp snooping max-groups

╟ ╕ , ৡ **ip igmp snooping max-groups** ৡ Â ৡ no ৸ ⁸ Â

ip igmp snooping max-groups *number*

no ip igmp snooping max-groups

ð Ô

Number: ѝ 0 – 1024 Â

bèL$ Ä

y ´r T õaN0 @

15.2

15.2.1 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 ЮО filter max-group
mrouter	
statistics	snooping

ð Ô

Â

ð ¾ Ô

EXEC Â

ð Ô

Â

ð Ô

ЮО fa0/1 Э 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

15.2.2 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 ˇ ⅃Ո ֳ 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

ð Ô

Â

ð ¾ Ô

EXEC Â

ð Ô

Â

ð Ô

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

ð ¾ Ô

15.2.4 debug igmp-snp

igmp Ł Â ¾ 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 ३ Ô

EXEC Â

ð Ô

Â

ð Ô

ð ३ Ô

16 MSTP

16.1

16.1.1 spanning-tree

MSTP˘ ˩ MSTP ˩ ˘ MSTP
Â ৡ no spanning-tree ╖ ˘ no ৡ

ð ¾Ô

show spanning-tree STP Â

spanning-tree mst cost STP PathCost Â

spanning-tree tx-hold-count STP TxHoldCount Â

16.1.2 spanning-tree bpdufilter

BPDU filter Â ¸Ú 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

16.1.3 spanning-tree bpduguard

BPDU Guard Â ¸Ú 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 ৡ 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

16.1.4 spanning-tree link-type

a “ ”Â ৸ Л৬ ৡ no Â

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

no spanning-tree link-type

ð Ô

poinit-to-point ' 8 й point-to-point.

Shared

spanning-tree max-hops *hop-count*

no spanning-tree max-hops

ð Ô

hop-count ' BPDU ┘Л ˘ й 1˙ 40

ð Ô

hop-count й 20

ð ३ Ô

.

ð ৡ Ô

.

ð Ô

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

ð ৡ Ô

show spanning-tree

16.1.7 spanning-tree mst 0 0 13.sB 310c 31c 31425.76 1d0}TJf9.6 0836.74572.

.

revision *version* MST ˘ 0 65535

Ю ⅋ Instance Â no ⅃
Л∪ ⅋ Â

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

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

ð Ô

instance-id ' Instance Л˘ й 0˙ 64

cost ′ ˘ й 1˙ 200˝ 000˝ 000

ð Ô

Instance-ID й 0

й Interface ╟ Â

• 1000 Mbps—20000

• 100 Mbps—200000

• 10 Mbps—2000000

ð ⅋ Ô

.

ð Ô

cost

ð Ô

Instance 3 й 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** ⅋
Э

ð ⅋Ô

show spanning-tree mst ' MSTP Â

spanning-tree mst port-priority '

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

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

ð Ô

Instance-id ' Instance ٨ˇ ٸ 0¨ 64

priority ' ˝I ˇ ٧ ٭ ٦ ٦ ٦

instance-id ' Instance ʌ˘ ѝ 0

16.1.12 spanning-tree tx-hold-count

STP TxHoldCount ˘ BPDU Â
३ no Â

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

no spanning-tree tx-hold-count

ð

ð ¾ Ô

show spanning-tree interface ' STP Â

16.1.14 spanning-tree portfast

Portfast Â ¬Ú ¾ disabled Portfast Â

spanning-tree portfast [**disabled**]

ð Ô

disabled Portfast Â

ð Ô

Â

ð ¾ Ô

Â

ð Ô

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

ð ¾ Ô

show spanning-tree interface ' STP Â

16.1.15 spanning-tree portfast bpduguard default

BPDU guard Â ¬Ú ¾ no BPDU guard Â

spanning-tree portfast bpduguard default

no spanning-tree portfast bpduguard default

ð Ô

¾ Â

ð Ô

BPDU Guard.

ð ¾ Ô

Â

ð Ô

BPDU guardˇ Э BPDUˇ 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

16.1.16 spanning-tree portfast bpdufilter default

BPDU filter Â ⅃ Л৬ 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

16.1.17 spanning-tree portfast default

Portfast Â ৡ no Portfast Â

spanning-tree portfast default

no spanning-tree portfast default

ð Ô

¾ Â

ð Ô

Portfast Â

ð ¾ Ô

Â

ð Ô

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

ð ¾ Ô

ð Ô

¾ Â

ð Ô

tc- guard Â

ð ¾ Ô

Â

ð Ô

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

16.1.20 spanning-tree tc-guard

tc- guard Â ¾ no tc- guard Â
tc-guard ¶ ˇ 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
```

16.1.21 spanning-tree guard root

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

spanning-tree guard root

no spanning-tree guard root

ð Ô

¾ Â

MSTP 3

loop guard ¶ Â

ð ¾ Ô

Â

ð Ô

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

16.1.24 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
```

16.1.25 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 ৡ Ô

show spanning-tree interface ' STP Â

16.1.26 bpdu src-mac-check

bpdu TJ3[m8

ð Ô

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

ð ¾Ô

16.2

16.2.1 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

16.2.2 show spanning-tree interface

STP Â ˩ Â

show spanning-tree interface *interface-id* [{**bpdufilter** | **portfast** |

.

ð Ô

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

ð ¸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

˘ a ˘ Â

show monitor ¾ ¬ Л SPAN Â

ð Ô

ЮО SPAN ' 1. ″I
˘ ″I 1 ˘ Л 1
8

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

~

S3760 Â

ð ¾ Ô

¾	
show monitor	SPAN Â

17.2 show monitor

SPAN Â

show monitor [**session** *session_number*]

ð Ô

SPAN

ð Ô

session *session_number* ' SPAN Л

ð ¾ Ô

ð Ô

ð Ô

ЮО **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 ৡ Ô

ৡ	
monitor session	SPAN ˆ ˜ ˆ ˜ Â

18 RSPAN

18.1

18.1.1 monitor session

¾ RSPAN Â

'

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

'

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

ð ¾Ô

¾	
show monitor	Â

ð ¼ Ô

18.1.2 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)# remote-span
```

ð ¾Ô

¾	

19 IP

19.1

ЛЪЮ ƺ'

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

19.1.1 ip address

ƺ IP ˇ ↓Л Ъ no IP Â
ƺ Ю'

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

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

ð Ô

ŕ ˘ ŕ ў ŕ Æ ≠
ѝ ŕ ˘ 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 '

- ў Â C
˘ ⅃ŕ 254 ⅄ ў Â ў 254 ⅄ ˘ C
a ŕ ˘ ŕ ⅄ C Â
ч ˘ Л IP Â

- γ ˘ ŕ Â IP
⅃Л ˘ IP Â
˘ IP Â

- 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	

ð ⅄ Ô

γ Э˘ Ь IP ˘ з a γ ˘
secondary

19.1.2 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	٨

ð Ô

ЮЎ ٨ Â

ð ع Ô

ð Ô

٨ ╟ IP ˘ a╡ IP ˘ ٨
έ IP Â ٨ IP ˘
IP й IP Â٦ ≠
IP ˘ ¤ ٨ Â ٨ ˘
ЛЮ ⁸'

- Л∪ a ٨ Â
- SLIP à HDLC à PPP à LAPB à Frame-relay ˘ ┘Л∪
٨ Â ˘
٨ ÂX.25 a ٨ Â
- a ping ع ٨ ˘ й ٨
IP Â SNMP ┘Л∪ ٨ Â
- a ٨ ╟ Â

ð Ô

ЛЮ ˘ й ٨ ˘ й FastEthernet 0/1 Â
IP Â

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

ð ع Ô

ع	
show interface	

ð ┘ Ô

ع γ Э a Â

19.2

ع '

- **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**

19.2.1 arp

ȝˇ ˩Л ARP ă ╗ IP MAC
Â ȝ no ˩Л MAC Â

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

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

ð Ô

ip-address	б MAC IP ˘ ˛ ѝ ⁸ ˘ Â
MAC-address	˘ 48 Æ
type	ARP Â Л ˘ ѝ arpa Â
alias	ˆ ˩ ˜ Ѭ ˥ˇ RGOS IP

ў ╟ ARP ˘ Л∪ a ARP
Â **clear arp-cache** ȝ ⅄Л∪ ╟ ˉ ARP Â

ð Ô

ЛЮ ˘ ѝЛ∪ Э ў ARP Â

```
arp 1.1.1.1 4e54.3800.0002 arpa
```

ð ȝÔ

ȝ	
clear arp-cache	ARP ă

19.2.2 arp retry interval

ȝ˘ ⅄Л∪ arp ˘ ⅄ IP
˘ 2 ARP Â ȝ no ⅄Л∪
1 ARP Â

arp retry interval *seconds*

no arp retry interval

ð Ô

seconds	<1-3600>,ARP ⅄Л∪ ѝ 1 ——3600 ˘ ѝ 1

ð Ô

ARP ѝ 1 Â

ð ȝ Ô

ð Ô

ARP ˘ ѐ ˘
⅄Л∪ ARP ˘ a ╟ ARP
Â

ð Ô

ЛЮ ˘ ARP ѝ 30s

```
arp retry interval 30
```

ð ȝÔ

ȝˇ ȷȻ ȷ ARP Â ȝ no
Â

arp trusted *number*

no arp trusted

ð Ô

number	ȷȻ ȷ ARP , ȷ <10-4096> Â

ð Ô

a ȷ a ȷ Â

ð ȝ Ô

ð Ô

ȝ ˘ ˮI ȷ ARP ╗ Â ȷ ARP è
˘ ȷ ´ ˘ ȷ ╠ ARP
a Â ˘ a Â

ð Ô

ȻЬЮ ˘ ȷȻ 1000 ȷ ARP Â

```
arp trusted 1000
```

ð ȝ Ô

ȝ	
service trustedarp	ȷ ARP ╗

19.2.5 arp trusted aging

ȝˇ ȷȻ ȷ ARP Â ȝ no
Â

arp trusted aging

no arp trusted aging

ð Ô

ð Ô

GSN ┘ ARP a Â

ð ३ Ô

ð Ô

३ ⁄ ┘ ARP ˘ ╟ ARP ┘ Â
┘ Л∪ Ю **arp timeout** ३ Â

ð Ô 194

Â

ð ३ Ô

३	
service trustedarp	┘ ARP ╖ ₴!r$5XT–!iyPHN4E₴!rPH%P€

ð ʒ Ô

19.2.7 arp gratuitous-send interval

ʒ˘ ˩ Л υ 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

ѝ Ю ˘ Ю Ї
ѝ˘ ˩ Л υ ARP ˘ Ѽ
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

19.2.8 arp timeout

ARP ă ш

10.2(3) Ì ˘ ¾ ARP Â

ð ¾ Ô

ð IP ARP
ARP
ARP

3) tc ˘

ð Ô

ЛЬЮ ˘ Ю˘ service trustedarp ╖ Â

```
config
service trustedarp
```

ð ⊀ Ô

ʒ γ Л Ь s32 Э a Â

19.3

б ʒ '

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

19.3.1 ip broadcast-addresss

Ня ˘ ʒ **ip broadcast-addresss** Â
ʒ no ⊀ Л Ь ⊀ 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 Ь˘ й 255.255.255.255 Â
RGOS ˚ ⊀ Л Ь Ня è IP ˘ з ⊀ Л Ь ⊀
Ґ 1 Ь Л Ь Ня Â

ð Ô

ЛЬЮ ˘ IP й 0.0.0.0 Â

```
ip broadcast-address  0.0.0.0
```

ð ⊀ Ô

ʒ γ Э a Â

19.3.2 ip directed-broadcast

IP ˘ ʒ **ip**

access-list-number	

ð Ô

ˆ ˩ ˜ /ˆ ÿ 1-199ˇ 1300 -
Â

ð ʒ Ô

ð Ô

IP й IP IP ˘

й 172.16.16.255

ЛЬЮ ˘ FastEthernet 0/1 Â

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

ð ⅄ Ô

ȝ γ Э a Â

19.4 IP

б IP ȝ '

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

19.4.1 clear arp-cache

ÿ ARP ă ╟ ARP ˘ Лυ IP ă ˘ ȝ clear arp-cache Â

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

ð ȝ Ô

ð Ô

⅃ Лυ ȝ ⁹ ARP Â

~

RNFP(Ruijie Network Foundation Protection,)
Э˘ mac (IP) ARP ˘ ч
clear arp 1s ˘ ⅃ γ
ARP a Â

ð Ô

ЛЬЮ ˇ ARP ╟ ă Â

```
clear arp-cache
```

ЛЬЮ ˇ ╟ ARP 1.1.1.1

```
clear arp-cache 1.1.1.1
```

ЛЬЮ ˇ SVI1 Ю ╟ ARP

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

```
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 Ђ Ю'

Protocol	˘ й Internet Â
Address	б ˚ IP Â
Age (min)	ARP ă ˘ Лџ Â ˘ “-” Â
Hardware	б IP ˚ Â
Type	˚ ˘ Лъ й ARPA Â
Interface	б IP Â

ЛъЮ show arp 192.168.195.68

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

ЛъЮ **show arp** *192.168.195.0 255.255.255.0*

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

```
Internet  192.168.195.1     0    00d0.f8a6.5af7   arpa
VLAN 1
Internet  192.168.195.51    1    0018.8b82.8691   arpa
VLAN 1
```

ЛЪЮ **show arp** *001a.a0b5.378d*

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

ð ⅄ Ô

ʒ γ Э a Â

19.4.3 show arp counter

ARP arp

show arp counter

ð Ô

ð ʒ Ô

ð Ô

ЛЪЮ ѝ **show arp counter** '

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

ARP ă ₩ Ю'

ð ⅄ Ô

ʒ γ Э a Â

19.4.4 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

ȝ

ARP ˘ ARP ˆ ╟ à à à ┘ ˜ à γ ˘ ┘Л ȝ Â

ЛЫЮ й **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        --
```

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

VLAN 1 3600

ARP

ˆ ARP˜ ă ˘ ʒ Â

show ip arp

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ð ʒ Ô

ð Ô

ЛЬЮ ѝ **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 ЊЖ ЮЎ

Protocol	˘ ѝ Internet Â
Address	б ˚ IP Â
Age (min)	ARP ă ˘ Лџ Â ˘ “-” Â
Hardware	б IP ˚ Â
Type	˚ ˘ Лъ ѝ ARPA Â
Interface	б IP Â

ð ⊀ Ô

ʒ γ Э a Â

19.4.8 show ip interface

ʒ ⊣ Л∪ IP Â ʒ Ю'

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

ð Ô

Interface-type	
Interface-number	Л

ð ʒ Ô

ð Ô

⊣ ˘ RGOS Â
⊣ RGOS ˚ ⊣ Л∪ Â ÿ ⊣
⊣ ѝ a ⊣ ˘ RGOS ˚ ÿ
Â

⊣ ˘ ⊣ ˘
Ґ UP Ł’ ⊣ ˘ Ґ UP Ł Â

a ⊣ ˘ ⊣ a ˘ ѝ
Â

ð Ô

Л∪Ю ѝ **show ip interface** Â

```
Ruijie# show ip interface FastEthernet 0/1
IP interface state is: UP
IP interface type is: BROADCAST
IP interface metric is: 0
IP interface MTU is: 1500
IP address is:
192.168.5.133/24 (primary)
IP address negotiate is: OFF
Forward direct-boardcast is: ON
ICMP mask reply is: ON
Send ICMP redirect is: ON
Send ICMP unreachabled is: ON
```

```
DHCP relay is: OFF
Fast switch is: ON
Route horizontal-split is: ON
Help address is: 0.0.0.0
Proxy ARP is: ON
Outgoing access list is not set.
Inbound access list is not set.
```

HO'

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ð Ô

ʒ γ Э Â

ð Ô

Ю й **show ip redirects** سفي

ð ⊿ Ô

३ γ Э Â

20.1.2 ip mask-reply

RGOS ˚ ICMP ˘ ICMP ˘ ३ **ip mask-reply** Â ३ no ICMP Â

ip mask-reply

no ip mask-reply

ð Ô

ICMP Â

ð ३ Ô

ð Ô

Э ˘ ѝ ⊿ ˘ ⊿Л ICMP ˘ ICMP Â

ð Ô

ЛЮ ˘ FastEthernet 0/1 ICMP Â

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

ð ⊿ Ô

३ γ Э a Â

20.1.3 ip mtu

IP ˆ MTU˜ ˘ ३ **ip mtu** Â ३ no ⊿Л Â

ip mtu *bytes*

no ip mtu

ð Ô

a ICMP

RGOS ICMP

ð Ô

ЛЬЮ FastEthernet 0/1 ICMP

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

ð Ô

Э a

20.1.5 ip source-route

RGOS IP **ip source-route** no

ip source-route

no ip source-route

ð Ô

ð Ô

RGOS IP IP IP RFC 791 ICMP

RGOS IP

ð Ô

ЛЬЮ IP

```
no ip source-route
```

ð Ô

Э a

20.1.6 ip unreachables

RGOS ICMP **ip unreachables**

21 DHCP

21.1 DHCP

21.1.1 bootfile

Ⱨ DHCP ╟ ˚ ˩˘ DHCP ֳ
bootfile Â ֳ **no** ˩ Ո ˩ Ⱨ Â

bootfile *file-name*

no bootfile

ð Ô

file-name	Ⱨ ╟ ˚ ˩ Â

ð Ô

Ⱨ ╟ ˚ ˩ Â

ð ֳ Ô

DHCP

ð Ô

DHCP ╟ Ю à ˚ ˘ DHCP
Ŀ ╟ ˚ ˩˘ DHCP ˩ Ո
Ŀ ^ TFTP˜ Ю ˚ Â è Ŀ **next-server** ֳ
Ⱨ Â

ð Ô

ՈЮ ˘ Ⱨ router.conf й ╟ ˚ ˩ Â

```
bootfile router.conf
```

ð ֳ Ô

ֳ	
ip dhcp pool	Ⱨ DHCP ˩ ˘ DHCP Â

next-server	DHCP ╟ Ю Ŀ IP Â

21.1.2 client-identifier

Ⱶ DHCP ˆ Ո Ὼ ⁸ ˜˜ DHCP
ƻ **client-identifier** Â ƻ **no** ˩ Ո
Â

client-identifier *unique-identifier*

no client-identifier

ð Ô

ð ¾ Ô

¾	
hardware-address	Ìæ DHCP ¨ Â
host	Ìæ IP Â DHCP Â
ip dhcp pool	Ìæ DHCP ¿ ˘ DHCP Â

21.1.3 client-name

Ìæ DHCP ¿ ˘ DHCP ¾ **client-name** Â
¾ no DHCP ¿ Â

client-name *client-name*

no client-name

ð Ô

client-name	Ìæ DHCP ¿ Â ¬ Ù ASCII Â ¿ a ¿ ¿˘ Ìæ river ù DHCP ¿ ˘ a Ìæ ù river.i-net.com.cn Â

ð Ô

Ìæ ¿ Â

ð ¾ Ô

DHCP

ð Ô

DHCP Ìæ ˘ ¬ Ù ¾ Ìæ DHCP
¿ Â ¿ a ¿ ¿ Â

ð Ô

ÙÞÖ ˘ Ìæ river ù ¿ Â

client-name river

ð ¾ Ô

¾	
host	Ìæ IP Â DHCP Â

ip dhcp pool	ԻՋ DHCP ؽ ˇ DHCP Â

21.1.4 default-router

ԻՋ DHCP ˇ DHCP ֽ **default-router** Â ֽ **no** ؽՈ ԻՋ Â

default-router *ip-address* [*ip-address2…ip-address8*]

no default-router

ð Ô

ip-address	ԻՋ IP Â Â
ip-address2…ip-address8	ˆ ؽ ˜ ؽՈ 8 Â

ð Ô

ԻՋ Â

ð ֽ Ô

DHCP

ð Ô

ЮˇDHCP ÿ DHCP Ь Â DHCP Ь й IP ˇ б¦ ؽ Â

ð Ô

ՈЮ ˇ ԻՋ 192.168.12.1 й Â

```
default-router 192.168.12.1
```

ð ֽ Ô

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

no dns-server

ð Ô

ip-address	Ĥ DNS Ł IP Â Â
ip-address2…ip-address8	ˆ ˩ ˜ ˩ Л 8 DNS Ł Â
use-dhcp-client *interface-type* *interface-number*	RGOS ˚ DHCP DNS Ł ˇ й DHCP DNS Ł Â

ð Ô

Ĥ DNS Ł Â

ð ¾ Ô

DHCP

ð Ô

Ĥ DNS Ł ˇ ”I ˇ DHCP б
DNS Ł ˇ Ю DNS Ł Â

RGOS ˚ ˩ ≠ DHCP ˇ ˩ Л DNS Ł ˇ DHCP Â

ð Ô

ЛЮ ˇ й DHCP DNS Ł 192.168.12.3 Â

```
dns-server 192.168.12.3
```

ð ¾ Ô

¾	
domain-name	Ĥ DHCP ˥ ˩ Â
ip address dhcp	DHCP ˩ IP Â
ip dhcp pool	Ĥ DHCP ˩ ˇ DHCP Â

21.1.6 domain-name

ĺĸ DHCP ȷ ȷˇ DHCP ¾ **domain-name** Â
¾ **no** ȷ Ȗ ȷ ȷ Â

domain-name *domain-name*

no domain-name

ð Ô

domain-name	ĺĸ DHCP ȷ ȷ Â

ð Ô

ȷ ȷ Â

ð ¾ Ô

DHCP

ð Ô

DHCP ȷ ȷ ȷˇ ɛ ȷ ȷ ȷ ў
ˇ ў ȷ ȷ Ȗ Â

ð Ô

ȖȕO ˇ DHCP ĺĸ ȷ ȷ i-net.com.cn Â

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

ð ¾ Ô

¾	
dns-server	ĺĸ DHCP DNS ȴ
ip dhcp pool	ĺĸ DHCP ȷ ˇ DHCP Â

21.1.7 hardware-address

ĺĸ DHCP ˚ ˇ DHCP ¾
hardware-address Â ¾ **no** ȷ Ȗ ˚ ĺĸ Â

hardware-address *hardware-ad9()TjET1cdd09e0>5.7<1e0b09e2>5.7<34d40db309e1>5.7*

type	DHCP ✧ ethernet ✧ ieee802 ✧ 1（10M ethernet） ✧ 6（IEEE 802）

ð Ô

ð Ô

DHCP

ð Ô

DHCP

ð Ô

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

ð Ô

client-identifier	DHCP
host	IP DHCP
ip dhcp pool	DHCP

ip-address	ֿ DHCP ў IP Â
netmask	ֿ DHCP ў Â

ð Ô

ֿ ў IP Â

ð ֽ Ô

DHCP

ð Ô

ֿ DHCP Ł IP
Â A ѝ 255.0.0.0 B ѝ 255.255.0
C ѝ 255.255.255.0 Â

DHCP ֿ ˘ ˩ Л ֽ Â

ð Ô

ЛЮ ˘ IP ѝ 192.168.12.91˘ ѝ
255.255.255.240 Â

```
host 192.168.12.91 255.255.255.240
```

ð ֽ Ô

ֽ	
client-identifier	ֿ DHCP ˆ Л Ώ 8 ˜ Â
hardware-address	ֿ DHCP ˚ Â
ip dhcp pool	ֿ DHCP ˩ ˘ DHCP Â

21.1.9 ip address dhcp

Л PPP àHDLC àFR DHCP IP
˘ ֽ **ip address dhcp** Â ֽ **no** ˩ Л ˩
Â

ip address dhcp

no ip address dhcp

ð Ô

a DHCP IP Â

ð ⅋ Ô

ð Ô

RGOS ˚ DHCP ˘ IP ˘ DHCP Ł
' 1˜ DHCP 1˜ ' 2˜ DHCP
3˝ ⅄ Э ' 3˜ DHCP 6˝ DNS Ł '
4˜ DHCP 15˝ ў ⅄ ⅄' DHCP 44˝ WINS Ł Â

RGOS ˚ PPP à FR à HDLC Э dhcp
˘ Ł ˘ Ł
╗

ð Ô

ЛЬЮ ˘ FastEthernet 0 ╟ IP Â

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

ð ⅋ Ô

⅋	
dns-server	ⅈ DHCP DNS Ł
ip dhcp pool	ⅈ DHCP ⅄ ˘ DHCP Ď

ⅈcpD

ð Ô

IP ˘ DHCP Ł ¦ DHCP
IP Â ¾ ˩ Л∪ и ў IP ˘
¦ DHCP Â Ђ IP ˘ ≠ ˩ Л∪ DHCP
Ł ¦ ă Â

ð Ô

ЛЬЮ ˘ DHCP Ł a ¦ 192.168.12.100~150
IP Â

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

ð ¾ Ô

¾	
ip dhcp pool	Ђ DHCP ˩ ˘ DHCP Â
networkˆ DHCP˜	Ђ DHCP /ı Â

21.1.11 ip dhcp force-send-nak

DHCP Ł ⁸ NAK˜ ЛЬЮ ¾ Â
¾ no ˩ Л∪ ⁸ NAK Â

ip dhcp force-send-nak

no ip dhcp force-send-nak

ð Ô

ð Ô

˘ a Â

ð ¾ Ô

ð Ô

RFC2131 ˘ DHCP Ł Request
˘

NAK˜ ˩ IP ˘ a Request
/ ˩ IP ˘ IP ˩ Â

˘ DHCP Ŀ NAK DHCP
˘ ≠ ȷ Л Â DHCP
ÿ ȷ ˘ DHCP Ŀ
˘ a NAK˘ DHCP a Request
ȷ ȷ IP ˘ IP ȷ ȷ Â DHCP
Ŀ ˘ ≠ Â
Ю˘ ȷ Л ȝ 8 DHCP Ŀ a
≠ NAK ˘ ȷ IP Â

' ȝ ˘ ȷ ˘ a ȷ DHCP
Ŀ ˘ DHCP ȷ a NAK ˘
Â Â

ð Ô

ЛЪЮ ˘ DHCP Ŀ 8 NAK Â

```
ip dhcp force-send-nak
```

ð ȝ Ô

ȝ	
ip dhcp pool	Ћ DHCP ȷ ˘ DHCP Â
service dhcp	DHCP Ŀ ȝ

21.1.12 ip dhcp ping packet

DHCP Ŀ ă ˘ ping ˘
ȝ **ip dhcp ping packet** Â ȝ **no** Â

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

ð Ô

number	ˆ ȷ ˜ ÿ 0 10˘ 0 ping Â ping ч Â

ð Ô

ping й 2 Â

ð Ô

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

ð Ô

ЛЮ ˘ ping ѝ 3 Â

```
ip dhcp ping packets 3
```

ð ȝ Ô

ȝ	
clear ip dhcp conflict	DHCP ˩ ă Â
ip dhcp ping timeout	DHCP Ł ping Â ping ˘ ˩ĭ , ă Â
show ip dhcp conflict	DHCP Ł ĭ ˘ ă Â

21.1.13 ip dhcp ping timeout

DHCP Ł ping ă ˘ ˘
ȝ **ip dhcp ping timeout** Â ȝ **no** ˩ Л
Â

ip dhcp ping timeout *milli-seconds*

no ip dhcp ping timeout

ð Ô

milli-seconds	DHCP Ł ping ^ Л ~ Â ˩ ѝ 100 10000 Â

ð Ô

ѝ 500 Â

ð ȝ Ô

ð Ô

Ыж ping Â

ð Ô

ЛЬЮ ˘ ping ù 600ms Â

ЛЬЮ ˘ Ю ¸ ù mypool0 DHCP Â

```
ip dhcp pool mypool0
```

ð ¦ Ô

¦	
host	Ю IP Â DHCP Â
ip dhcp excluded-address	Ю DHCP Ь a ¦ IP Â
networkˆ DHCP˜	Ю DHCP Л Â

21.1.15 lease

Ю DHCP Ь ¦ ˘ DHCP ¦ **lease** Â ¦ **no** Â

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

no lease

ð Ô

days	Ю ˘ Лъ ù Æ Â
hours	ˆ ¸ ˜ Ю ˘ Лъ ù Æ Â Ю Ю Â
minutes	ˆ ¸ ˜ Ю ˘ Лъ¦ ù Æ Â Ю¦ Ю Â
infinite	Ю 8 Â

ð Ô

ù Â

ð ¦ Ô

DHCP

ð Ô

˘ DHCP Â DHCP Ь ˘ a ¸ Â

ð Ô

ЛЬЮ ˘ DHCP ù 1 Â

lease 0 1

ЛЪЮ ˇ DHCP ѝ 1ǂ Â

lease 0 0 1

ð ع Ô

ع	
ip dhcp pool	ЬѪ DHCP ɻ ˇ DHCP Â

21.1.16 netbios-name-server

DHCP NETBIOS WINS ɻ Ь ˇ DHCP ع **netbios-name-server** Â ع no ɹЛъ WINS Ь Â

netbios-name-server *ip-address* [*ip-res2…(padv)4.3d(es8s]TJTT2 1 Tf121.44 0 TD0.0022*

ip address dhcp	DHCP ৸ IP Â
ip dhcp pool	׀ DHCP ɹ ˘ DHCP Â

21.1.17 netbios-node-type

׀ DHCP ў NetBIOS ˘ DHCP ֽ **netbios-node-type** Â ֽ **no** ৸ Л∪ NetBIOS Â

netbios-node-type *type*

no netbios-node-type

ð Ô

type	׀ NetBIOS ˘ ч Â ׀˝ ў 0~FF˝ ΄Ω ⁸ ˘ ৸ ЛυЮ ' ✧ 1˝ ֽ b-node' ✧ 2˝ ֽ p-node' ✧ 4˝ ֽ m-node' ✧ 8˝ ֽ h-node Â ׀' ✧ b-node˘ ' ✧ p-node˘ ' ✧ m-node˘ ' ✧ h-node˘ Â

ð Ô

׀ NetBIOS Â

ð ֽ Ô

DHCP

ð Ô

DHCP NetBIOS ' 1˝ Broadcast˘ ˘ NetBIOS ɹ ' 2˝ Peer-to-peer˘ ˘ WINS Ł NetBIOS ɹ ' 3˝ Mixed˘ ˘ ″I ɹ ˘ ɹ б WINS Ł ɹ ' 4˝ Hybrid˘ ˘ ″I WINS Ł NetBIOS ɹ ˘ ˘ NetBIOS ɹ Â

Ю˜ ѝ Â

ٹ ٦ **show ip dhcp binding** ٪ ˘ ă
٦ **show ip dhcp conflict** ٪ Â

ð Ô

ЛЮЮ ˘ Ⱶ DHCP Л й 192.168.12.0ˇ й 255.255.255.240 Â

```
network 192.168.12.0 255.255.255.240
```

ð ٪ Ô

٪	
ip dhcp excluded-address	Ⱶ DHCP Ł a ٹ

```
next-server 192.168.12.4
```

ð ¾Ô

¾	
bootfile	Hª DHCP ╟ ˚ ˩
ip dhcp pool	Hª DHCP ˩ ˘ DHCP Â
ip help-address	Hª Helper
option	RGOS ˚ DHCP ┗ Â

21.1.20 option

DHCP ┗ ˘ DHCP ¾ **option** Â ¾ **no** ˥ Л∪ option Hª Â

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

no option

ð Ô

ЛЬЮ ˘ ֽ 19 ЊЌ ā DHCP IP Â0 IP ' 1 IP ÂЛЬ Ю ˘ DHCP IP Â

```
option 19 hex 1
```

ЛЬЮ ˘ ֽ 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 ֽ Ô

ֽ	
ip dhcp pool	ЊЌ DHCP ɻ ˘ DHCP Â

21.1.21 service dhcp

Э DHCP Ь ֽ ˘ ֽ **service dhcp** Â ֽ **no** ɹЛЬ DHCP Ь ֽ Â

service dhcp

no service dhcp

ð Ô

ð Ô

DHCP Ь ֽ Â

ð ֽ Ô

ð Ô

DHCP Ь ɹЛЬ ╟ ↑ IP ˘ DNS Ь à ÂDHCP ɹЛЬ DHCP è Ь ˘ DHCP DHCP ˘ DHCP Â

Э ɹ DHCP ╖ è ╖ ă ˘ é ˘ ЛЬ Â

ð Ô

ЛЬЮ ˘ DHCP ┺ Â

```
service dhcp
```

ð ৡ Ô

ৡ	
show ip dhcp server statistics	DHCP ┺ Â

21.2

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

21.2.1 clear ip dhcp binding

DHCP ˘ **clear ip dhcp binding** ৡ Â

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

ð Ô

*	DCHP Â
ip-address	IP Â

ð Ô

ѝ Â

ð ৡ Ô

ð Ô

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

ð Ô

ЛЪЮ ˘ IP ѝ 192.168.12.100 DHCP Â

```
clear ip dhcp binding 192.168.12.100
```

ð ¾Ô

¾	
show ip dhcp binding	DHCP Ł Â

21.2.2 clear ip dhcp conflict

DHCP ă ˘ **clear ip dhcp conflict** ¾Â

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

ð Ô

*	DCHP ă Â
ip-address	IP ă Â

ð Ô

ѝ Â

ð ¾ Ô

ð Ô

DHCP Ł ă ping ˘ DHCP ă
ˆ ARP˜ Â**clear ip dhcp conflict** ↓ЛЪ ↓ ă Â

ð Ô

ЛЪЮ ˘ ă Â

```
clear ip dhcp conflict *
```

ð ¾Ô

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

21.2.3 clear ip dhcp server statistics

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

clear ip dhcp server statistics

ð Ô

ѝ Â

ð ৡ Ô

ð Ô

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

ð Ô

ЛЬЮ ˘ DHCP Ł Â

```
clear ip dhcp server statistics
```

ð ৡ Ô

ৡ	
show ip dhcp server statistics	DHCP Ł Â

21.2.4 debug ip dhcp client

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

debug ip dhcp client

no debug ip dhcp client

ð Ô

ð Ô

ð ৡ Ô

ð Ô

঳ dhcp client ┗ ў ˘ Л
Â

ð Ô

ЛЮ ˘ Э dhcp Â

```
debug ip dhcp client
```

ð ঳Ô

21.2.5 debug ip dhcp server

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

debug ip dhcp server

no debug ip dhcp server

ð Ô

ð Ô

ð ঳ Ô

ð Ô

঳ dhcp server ў ˘ Л
Â

ð Ô

ЛЮ ˘ Э dhcp ┗ Â

```
debug ip dhcp server
```

ð ঳Ô

21.2.6 show dhcp lease

DHCP ˘ EXEC ঳ **show dhcp lease** Â

show dhcp lease

ð Ô

ð Ô

ы Â

ð ঳ Ô

ð Ô

ЮЖ IP ˘ Â ЮЖ IP ˘
IP Â

ð Ô

ЛЬЮ ы **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
```

Ⱶ IP ˘ Â Ⱶ IP ˘
IP Â

ð Ô

ЛЮ ỳ **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
```

Ⱶ ЮÂ

IP address	↑ DHCP IP Â
Client-Id/ Hardware address	DHCP client identifier ˚
Lease expiration	Â Infinite 8’ IDLE ˘ ↵ DHCP ў ╟ Â
Type	Â Automatic ╟↑ ’ Manual ↑ Â

ð ֽ Ô

ֽ	
clear ip dhcp binding	DHCP

21.2.8 show ip dhcp conflict

DHCP ┗ ă ˘ EXEC ֽ **show ip dhcp conflict** Â

show ip dhcp conflict

ð Ô

ð Ô

ỳ Â

ð ֽ Ô

ð Ô

ֽ ↵Л DHCP ┗ ă Â

ð Ô

ЛЬЮ ѝ **show ip dhcp conflict** ¾ Â

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

dhcpd excluded ipaddress
192.168.12.100
```

ЊЖ ЮÂ

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

ð ¾Ô

¾	
clear ip dhcp confict	DHCP ă

21.2.9 show ip dhcp server statistics

DHCP └ ˘ EXEC ¾ **show ip dhcp**

22 DHCP Relay

22.1 DHCP Relay

DHCP ЛЬЮ ৡ'

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

22.1.1 service dhcp

Э DHCP ৡ ˘ ৡ s**ervice dhcp** Â
ৡ no ┘Л DHCP ৡ Â

service dhcp

no service dhcp

ð Ô

DHCP ৡ Â

ð ৡ Ô

ð Ô

DHCP ┘Л DHCP è Ł ˘
DHCP DHCP ˘ DHCP Â

ð Ô

ЛЬЮ ˘ DHCP Ł Â

```
service dhcp
```

ð ৡ Ô

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

22.1.2 ip helper-address

ৡ ┘Л ╗ DHCP Ł Â ৡ 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

22.1.3 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

ð Ô

¦˘ DHCP REQUEST
server-id option server Â

ð Ô

ЛЬЮ ˘ Â

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

ð ¦ Ô

¦	
Service dhcp	DHCP ¦

service dhcp	DHCP ঃ

23 DNS

23.1

23.1.1 ip domain-lookup

╟ DNS ﻝ Â ৡ no DNS ﻝ ╖ Â

ip domain-lookup

no ip domain-lookup

ð Ô

ы DNS ﻝ ╖ Â

ð ৡ Ô

ð Ô

ৡ ы DNS ﻝ ╖ ˘ ৡ˘ ╟ DNS ﻝ Â

ð Ô

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

ð Ô

ip-address	٫ ٹ IP

ð Ô

٫ ٹ

ð ٦ Ô

ð Ô

╗ DNS Server IP Â ٦˘ ╗ DNS Server Â ÿ Server ٧ ٫ ˘ ٨ Server DNS ˘ ٸ Â

6 ٹ Â DNS Server ˘ ip-address ˘ ٹ ˘ DNS ٹ Â

ð Ô

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

ð ٦ Ô

٦	
show hosts	DNS Â

ð Ô

٦ RGOS10.1 Э Â

23.1.3 ip host

٦ ў ٫ IP Â ٦ no ў Â

ip host *host-name ip-address*

no ip host *host-name ip-address*

ð Ô

host-name	صلعم ¢

ip-address	IP

ð ʒ Ô

ð Ô

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

ð Ô

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

ð ʒ Ô

ʒ	
show hosts	DNS Â

ð Ô

ʒ RGOS10.1 Э Â

23.1.4 clear host

╟ ў ˌ ă ˘ ˩Л ʒ Â

clear host [*host-name*]

ð Ô

host-name	˩Л ╟ ў ˌ ă Â “*” ʒ ╟ ў ˌ ă Â

ð ʒ Ô

ð Ô

ў ˌ ă ˘ ч ' 1˜ ip host ' 2˜
DNS ╟ ˜ Â ʒ˘ DNS ╟ ˜
ў ˌ Â

ð Ô

ЛЬЮ ˘ ў ˌ-IP ă ╟ ˜ Â

```
clear host *
```

ð ৡ Ô

ৡ	
show hosts	ў ˧ ă

ð Ô

ৡ RGOS10.1 Э Â

23.1.5 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 ˧ IP
ip name-server	DNS ⊾

ð Ô

ৡ RGOS10.1 Э Â

24 SNTP

24.1

ৡ

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

24.1.1 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

24.1.2 sntp server

¯ SNTP Server˘ SNTP NTP ˇ Л
Server ˩ Л internet Э Ω NTP Server Â

sntp server *A.B.C.D*

no sntp server

ð Ô

A.B.C.D ' NTP/SNTP Ł IP

ð Ô

NTP/SNTP Ł

ð ¯ Ô

ð Ô

show sntp ¯ SNTP

ð Ô

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

ð ¯ Ô

¯	
show sntp	SNTP
sntp enable	SNTP

ð ˩ Ô

˚ RGOS10.0 Л Э

24.1.3 sntp interval

¯ SNTP Client NTP/SNTP Server ˩
Â

sntp interval *seconds*

no sntp interval

ð Ô

seconds ' ˩ ˇ Æ и Ґ Ł и 60 --65535 Â

ð Ô

и 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

24.2

б ЛЪЮ ¦:

- **show sntp**

24.2.1 show sntp

¦ SNTP Â

ð Ô

ð ¦ Ô

ð Ô

show sntp ¦ SNTP

ð Ô

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

ð ʒ Ô

ʒ	

25 NTP

25.1 NTP

NTP ЛЬЮ ⅋'

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

25.1.1 no ntp

ntp ⅄ ⊾˘ б ⊾ ⅄ ˘ ntp Â

no ntp

ð Ô

Â

ð Ô

Ю NTP ⊾ Â

ð ⅋ Ô

Â

ð Ô

Ю˘ NTP ╖ ˘ NTP ⊾ NTP
⁸˘ NTP ╖ Â

ð Ô

ЛЬЮ ˘ NTP ⊾Â

no ntp

ð ʒ Ô

ʒ	
ntp server	NTP Ł

25.1.2 ntp access-group

NTP Ł 8 ˘ ʒ no ˬ 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 ˬ ˆ ~ Â
serve	NTP Ł 8 ˘ а б ˬ Â
serve-only	NTP Ł Â
query-only	NTP Ł 8 Â
access-list-number	IP 8 /ı’ ˝ 1˙ 99 1300˙ 1999
access-list-name	IP 8 ˬ Â

ð Ô

Ю NTP 8 Â

ð ʒ Ô

Â

ð Ô

NTP Ł 8 Â
˘ NTP 8 Â

˘ NTP Ł ÿ ȣ ȣ
ɳ ˘ Ʌʊ ɳ ѝ Â ɳ ѝ peer à
serve à serve-only à query-only Â

~

ȣ ╖ Â Э ɳ ˘
б ȣ Â

ȣ ˘ Â
ȣ ˘ Â

ð Ô

ɅʊЮ 1 ʌ
à ȣ ɻ ’ ȣ 2 ʌ
Â

```
Ruijie(config)# ntp access-group peer 1
Ruijie(config)# ntp access-group serve-only 2
```

ð ȝ Ô

ȝ	
ip access-list	IP ȣ Â

25.1.3 ntp authenticate

NTP Ł NTP ȣ Â

ntp authenticate

no ntp authenticate

ð Ô

Â

ð Ô

Ю NTP ȣ Â

ð ȝ Ô

Â

ð Ô

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

Э ѝ 1024 ˘ Ь

ð Ô

ЛЬЮ ID ѝ 6

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

ð ʒ Ô

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

25.1.5 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

25.1.6 ntp master

ѝ NTP ў ˆ ˧ ~ ˘ ѝ è
˧ Â ʒ no ѝ ˧ NTP ў Â

ntp master *[stratum]*
no ntp master

ð Ô

stratum	˘ ѝ 1· 15’ a ѝ 8 Â

ð Ô

a NTP ў ╖ Â

ð ʒ Ô

Â

ð Ô

Ю˝ б ˧ Â
б ˧ ˘ ˧
Лъ ʒ ˧ ˘ ѝ è ˧ Â
˘ a б è
˧ Â

~

ʒ Â ѝ ў ˆ è
æ ~ ˧ Â ˧
ʒ˘ ˧
˧ a Â
˦ ˘ ʒ ÿ б ˧ ˘ ˧ ╟
Лъ è a Â

ð Ô

ЛЬЮ ⅃ ˘ è ѝ 12 Â

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

ð ʒ Ô

25.1.7 ntp server

ѝ NTP NTP Ł Â

ntp server

NTP Ю ù
IP ¬Л NTP ╘ Â

ð Ô

ЛЮ ˘ Э ù NTP server Â

IPv4 ' Ruijie(config)# ntp server 192.168.210.222

ð ¾Ô

¾	
no ntp	NTP ╘╖ Â

25.1.8 ntp trusted-key

ID ù

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 ˘ ù ╘ 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 ┗ Â

25.1.9 ntp update-calendar

NTP ÿ ⊿

˚ ÿ Ă Ŭ Ŏ ɑ

NTP ⊾ ˘ NTP ˘ ╗ ⊿
⊾ ⅋ a Â

ð Ô

ЛЬЮ ˘ NTP Â

```
show ntp status
```

ð ⅋ Ô

26 UDP-Helper ¾

26.1

26.1.1 udp-helper enable

udp-helper enable ¾ ╠ UDP ╗ Â **no**
udp-helper enable ¾ UDP ╗ Â

ЮО UDP Â

udp-helper enable

no udp-helper enable

ð Ô

ð Ô

UDP

ð ¾ Ô

ð Ô

UDP-Helper ╗ ˘ 69,53,37,137,138,49
UDP Â

ð Ô

ЮО ╠ UDP ╗ :

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

ð ¾ Ô

¾	
ip forward-protocol	UDP

ð Ô

¾ RGOS10.1 Э Â

26.1.2 ip helper-address

UDP Ł Â no UDP
Ł Â

ip helper-address *address*

no ip helper-address *address*

ð Ô

address	UDP Ł ˘ ŭ ĭ ⁸ ˘ 20 Ł Â

ð Ô

UDP Ł

ð ֽ Ô

ð Ô

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

no ip helper-address ɻ Ł Â

ð Ô

Ю UDP Ł '

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

ð ֽ Ô

ֽ	
ip forward-protocol	UDP

ð Ô

ֽ RGOS10.1 Э Â

26.1.3 ip forward-protocol

ֽ UDP Â ֽ **no**
ɻ 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

¾	
udp-helper enable	UDP
ip forward-protocol	UDP

ð Ô

¾ RGOS10.1 Э Â

27 SNMP

27.1

SNMP ЛЬЮ ৡ'

- **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**

27.1.1 no snmp-server

SNMP ৡ ╖ ˘ ৡ **no snmp-server** Â

no snmp-server

ð Ô

SNMP ৡ ╖

ð ৡ Ô

ð Ô

ৡ SNMP ৡ Ŀ Â

ð Ô

Ю SNMP ৡ Ŀ'

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

27.1.2 snmp-server chassis-id

SNMP /Ì˘ ¾ **snmp-server chassis-id** Â ¾ no ¸ Â

snmp-server chassis-id *text*

no snmp-server chassis-id

ð Ô

text ' /Ì ˘ ¿Ú Â

ð Ô

/Ì 60FF60

ð ¾ Ô

ð Ô

SNMP /Ì /Ì˘ Ú Â /Ì ¿Ú **show snmp** ¾ Â

ð Ô

Ю SNMP /Ì ¸ 123456:

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

ð ¾Ô

¾	
show snmp	SNMP

27.1.3 snmp-server community

SNMP ˘ ¾ **snmp-server community** Â ¾ no ¼ SNMP Â

snmp-server community *string* [**view** *view-name*] [[**ro** | **rw**] [**host** *ipaddr*] [*number*]

no snmp-server community *string*

ð Ô

string ' ˘ NMS SNMP ¾ Â

view-name ¿ ˘ Â

ð ¾ Ô

ð Ô

Ю SNMP й i-net800@i-net.com.cn '

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

ð ¾Ô

¾	
show snmp-server	SNMP
no snmp-server	SNMP ¾ ¶

27.1.5 snmp-server enable traps

SNMP ў ╟ NMS Trap ˘
Y˚ ˘ ¾ **snmp-server enable traps** Â ¾
no SNMP NMS ў ╟ Trap Â

snmp-server enable traps [**snmp**]

no snmp-server enable traps

ð Ô

snmp ' SNMP Y˚ Â

ð Ô

Ю˝

ð ¾ Ô

ð Ô

¾ б ¾ **snmp-server** ˘ Â

ð Ô

Ю ў ╟ SNMP Y˚ '

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

ð ¾Ô

ʒ	
snmp-server host	SNMP ў

Ю SNMP ў ˘ SNMP Y˚ '

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

ð ¾Ô

¾	
snmp-server enable traps	

27.1.7 snmp-server location

SNMP Æ ˘ ¾ **snmp-server location** Â ¾ no ¼ SNMP Æ Â

snmp-server location *text*

no snmp-server location

ð Ô

text ' Â

ð Ô

й

ð ¾ Ô

ð Ô

Ю '

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

ð ¾Ô

¾	
snmp-sever contact	SNMP

27.1.8 snmp-server packetsize

8 SNMP ˘ ¾ **snmp-sever packetsize** Â ¾ no Â

snmp-server packetsize *byte-count*

no snmp-server packetsize

ð Ô

byte-count ˘ ÿ 484 17876 Â

ð Ô

1500

ð ¾ Ô

ð Ô

¾	
snmp-server packetsize	SNMP

27.1.10 snmp-server system-shutdown

SNMP ¶ ˘ ¾ **snmp-server system-shutdown** Â ¾ no ¼ SNMP ¶ Â

snmp-server system-shutdown

no snmp-server system-shutdown

ð Ô

SNMP ¶

ð ¾ Ô

ð Ô

¾ SNMP ¶ ˘ RGOS

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

27.1.12 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

27.1.13 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 ' ¸ Â

groupname' ¸

v1 | **v2** | **v3** ' SNMP Â v3 ¸ Â

encrypted ' ¼ Â ˘ Ћ Â Ћ ˘ 16 ¸ Â MD5 ¼ 16 ˘ SHA ¼ 20 Â Ћ 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* ' ¼ ╗ ¯ 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

27.1.14 snmp-server group

SNMP ˘ ¾ **snmp-server group** Â
¾ no Â

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

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

ð Ô

v1 | **v2c** |**v3** ' SNMP Â

auth' a ˘ v3 Â

noauth' a ≠ a ˘ v3 Â

priv' ˩ ˘ v3 Â

readview' Â

writeview' Â

ð Ô

ð ¾ Ô

ð Ô

ÞO '

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

ð ¾ Ô

¾	
show run	

27.2

27.2.1 show snmp

SNMP ˘ ¾ **show snmp** Â

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

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

ð ¾Ô

¾	
snmp-server *chassis-id*	SNMP /ì

28 RMON

28.1

RMON ЛЬЮ ¯'

- **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**

28.1.1 rmon collection stats

ЛЬ ¯ Â no ¼ Â

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

no rmon collection stats *index*

ð Ô

ð ¯ Ô

ð Ô

ð Ô

ЛЬЮ ˘ ¼Л Л 1 Â

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

ð ¾Ô

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

28.1.2 rmon collection history

Ло ¸ ¾Â **no** ¸ Â

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

no rmon collection history *index*

ð Ô

ð ¾ Ô

ð Ô

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

ð Ô

ЛоЮ ˘ ¸Ло Ло 1 ¸ Â

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

ð ¾Ô

¾	

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 ˃ 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

Л↓Ю ˘ 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 ˃ Ô

˃	
rmon event *number* [**log**] [**trap** *community*] [*description-string*]	╕ Y˚ Ⱶ

28.1.4 rmon event

Ⱶ Y˚ ˃ Â **no** ↓ Â

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

no rmon alarm *number*

ð Ô

ð ˃ Ô

ð Ô

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 ¾ Ô

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

28.2

28.2.1 show rmon statistics

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show rmon statictics

ð Ô

ð ¾ 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 ¾ Ô

¾	
rmon collection stats *index* [**owner** *owner-string*]	¶

28.2.2 show rmon history

Â

show rmon history

ð Ô

ð ¾ 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 ৄ Ô

ৄ	

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

ð ৲Ô

৲	

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

29 VRF

29.1 VRF

VRF ¾ '

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

29.1.1 show ip route vrf

VRF

show ip route vrf *vrf-name* [*network*[*mask*]]

ð Ô

vrf-name	VRF ¸
network	^ ¸ ~
mask	^ ¸ ~

ð Ô

VRF

ð ¾ Ô

ð Ô

VRF

ð Ô

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

ð ¾Ô

¾	
clear ip route vrf	VRF

ð Ô

RGOS10.1 Л Э

29.1.2 clear ip route vrf

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

29.1.3 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

29.1.4 rd

rd *rd_value*

ЬЖ vrf rd ˇ VRF Â ЮO VRF
ɻ a ɻˇ rd ˇ ѝ ɻ VRF˝
ЮO VRF Â

ð Ô

rd_value ɻ Л∪ ч a ɻ '

1) rd_value as_num' nn

an_num Ѽ Лˇ nn ЬЖ

2) rd_value ip_addr:nn

ip_addr IP ˇ nn ЬЖ

ð Ô

ЮO rd ˇ ѝ vrf rd

ð ֽ Ô

vrf

ð Ô

ЬЖ vrf˝ з ѝ RD ˇ ֊ RD Â
RD ˇ vrf ″I ˇ Л Ѧ ѝ RD
Â

vrf RD ˇ ֊ ѝ ЬЖ RD Â

ð Ô

```
Ruijie(config)# ip vrf vrf1
Ruijie (config-vrf)# rd 100:1
```

ð ֽ Ô

import ѝ vrf import

export ѝ vrf export

both ѝ vrf ؍ imporot export

rt_value ؍ Л∪ ч ؋ '

- rt_value as_num' nn

as_num Ѽ /ӏ ,nn Ӈ

- rt_value ip_addr:nn

ip_addr IP ,nn Ӈ

ð Ô

Ю Route-Target Â

ð ֽ Ô

vrf

ð Ô

vrf ؍ Л∪ Ӈ route-target.import Ӈ vrf ˘ export Ӈ vrf

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 ֽ Ô

ֽ	
ip vrf	vrf

ð Ô

RGOS10.3(3)Л∪ Э

29.1.6 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

ЮЎ a VRF

ð ϡ Ô

ð Ô

╗ VRF

ð Ô

```
Ruijie(config-if)# ip vrf forwarding redvrf
```

ð Ô

RGOS10.1 Л Э

29.1.7 show ip vrf

VRF

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

ð Ô

brief ' ^ ⅃ ~ VRF è

detail ' ^ ⅃ ~ VRF è

interfaces ' ^ ⅃ ~ VRF è

vrf-name ' (⅃) VRF

ð Ô

˘ VRF

ð ϡ Ô

ð Ô

ϡ VRF ˘ ⅃ Л ч '

- brief
- detail

VRF ˘ interfaces

ð Ô

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

ð Ô

RGOS10.1 Л Э

30 RIP

30.1

30.1.1 address-family RIP

RIP ˘ ¦

address-family˘ ˘ ¦

no Â

address-family ipv4 vrf *vrf-name*

no address-family ipv4 vrf *vrf-name*

ð Ô

vrf *vrf-name*	¦ VRF ˩ Â

ð Ô

a RIP Â

ð ¦ Ô

Â

ð Ô

address-family ¦ ˆ ˝'
(config-router-af)#˜ Â VRF ˘ RIP
VRF RIP Â Ю˘ ˩Л Л VRF RIP
Â

˘

exit-address-family **exit** ¦ Â

ð Ô

ЛЮ ˘ ˩ ˝ vpn1 VRF˜ ˝ 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 ¾ Ô

¾	
exit-address-family	Â
ip vrf	VRF Â

30.1.2 auto-summary (RIP)

RIP ╟ ╖ ˘ ¾ **auto-summary** Â
¾ **no** ╟ ╖ Â

auto-summary

no auto-summary

ð Ô

Â

ð Ô

╟ ╖ Â

ð ¾ Ô

Â

ð Ô

RIP ╟ ˘ ˘ ╟
Â RIPv1 RIPv2 Ю ╟ Â

RIP ╟ ╖ ˘ Â
˘ a ˘ ┘Л
Â

˘ ў ЛЮ '

- RIP ˘ ″I ’
- RIP ˘ ˘ Â
- ┘ έ ˘ a ⅄
  ˘ ╟ ╖ 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 ३Ô

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

ð ३ Ô

३	
redistribute	ÿ ↑ ↓ Â

30.1.4 default-information originate(RIP)

RIP ˘ ↓ Л ३ **default-information originate** ३˘ ३ **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 ३ Ô

Â

ð Ô

˘ RIP a ˘ **default-information originate** ३ ˘ 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 ֿ ˘ ѫ RIP a ″Ą ˉ
Â

ip default-network ˘ ÿ
default-information originate ֿ RIP Â

ð Ô

ЛЬЮ RIP Â

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

ð ֿ Ô

ֿ	
ip rip default-information	
redistribute	ὲ RIP

30.1.5 distance

RIP ˘ ֿ **distance** Â
ֿ **no** Â

distance *distance* [*ip-address wildcard*]

no distance [*distance ip-address wildcard*]

ð Ô

distance	RIP ˘ <1-255>
ip-address	IP
wildcard	⊮ѫ IP Æ˘ ˚ ך ˘ ″ a Â

ð Ô

ѝ 120 Â

ð ֽ Ô

Â

ð Ô

ֽ RIP Â

˩ Л Ъ ֽ ˇ RIP

˘ ˘ RIP

Â

ð Ô

ЛЪЮ ˇ RIP ѝ 160, ÿ 192.168.12.1

˗ ѝ 123

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

30.1.6 distribute-list in RIP

8 ˇ Л Ъ ˇ ֽ

distribute-list in Â ֽ **no** Ⱨ Â

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*]

ð Ô

access-list-number	Â ˇ ˩ Л Ъ Â
prefix *prefix-list-name*	Â
gateway *prefix-list-name*	Â
interface-type interface-number	(˩) ˊ ˇ Â

ð Ô

Ⱨ Â

ð ȝ Ô

Â

ð Ô

ѝ ˘ ⅃ Л Ƭ ⁸ ˘
Â

˘ Â

ð Ô

ЛЬЮ ˘ RIP ÿ Fastethernet 0/0 ˘
⁸ ˘ 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

30.1.7 distribute-list out RIP

⁸ ˘ Л Ƭ ˘ 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 ˘ ⅃ Л Ƭ Â
prefix *prefix-list-name*	Â
interface	(⅃) ƫ ˘ ⁸ 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

30.1.8 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

ЛЮ ˘ '

```
Ruijie(config-router)# address-family ipv4 vrf vpn1
```

RIPv1 a RIP ˘ RIPv2 Â

ð Ô

ЛЬЮ ˘ Serial 0 RIP ˘ ŷ ripchain Â

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

ð ֽ Ô

ֽ	
ip rip authentication mode	Ю RIP Â
ip rip authentication text-password	RIP Â
key chain	˘ Â

30.1.10 ip rip authentication mode

Ю RIP ˘ ֽ **ip rip authentication mode** Â ֽ **no** RIP Â

ip rip authentication mode {**text** | **md5**}

no ip rip authentication mode

ð Ô

text	RIP ŷ Â
md5	RIP ŷ MD5 Â

ð Ô

ŷ Â

ð ֽ Ô

Â

ð Ô

RIP ˘ RIP ˘
RIP ˘ RIP Â

RIPv1 a RIP ˘ RIPv2 Â

ð Ô

ЛЬЮ ˘ Serial 0 RIP ѝ MD5 Â

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

ð ¾ Ô

¾	
ip rip authentication key-chain	RIP ˘ RIP Â RIPv2 RIP Â
ip rip authentication text-password	RIP Â

30.1.11 ip rip authentication text-password

RIP ˘ ¾ **ip rip authentication text-password** Â ¾ **no** Â

ip rip authentication text-password *password-string*

no ip rip authentication text-password

ð Ô

password-string	˘ 1 16 Â

ð Ô

Â

ð ¾ Ô

Â

ð Ô

RIP ¶ ˘ ˩ Л Ъ ¾
˘ ≠ ˩ Л Ъ ˩ ˘ Л ″I Â

RIPv1 a RIP ˘ RIPv2 Â

ð Ô

ЛЬЮ ˘ Serial 0 RIP ˘
ѝ ruijie Â

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

ð ¾ Ô

¾	
ip rip authentication mode	ĦŦ RIP Â
ip rip authentication key-chain	RIP ˘ RIP Â RIPv2 RIP Â

30.1.12 ip rip default-information

ÿ RIP ˘ ¾ **ip rip default-information** Â ¾ **no** ↓ Â

ip rip default-information¸ **only**¸ **originate**' [**metric** *metric-value*]

no ip rip default-information

ð Ô

only	˘ a è Â
originate	˘ ≠ è Â
metric *metric-value*	˘ ↓ ' 1-15Âm e t r i c

ЛЪЮ ˘ 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

30.1.13 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

ЛЪЮ ˘ 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 ╟

30.1.14 ip rip receive version

Ю RIP Э RIP ˘
˃ **ip rip receive version** Â ˃ **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

ы ˩ ¤ **version** ˃ Â

ð ˃ Ô

Â

ð Ô

˃ ˘ ˩Л **vesion** ˃ Â ˃
RIP ы˘ ˩Л ˩ RIPv1 RIPv2
Â ˃ a ы ˩ ¤ version Â

ð Ô

ЛЮ ˘ Fastethernet 0/0 ˩Л RIPv1 RIPv2
Â

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

˃	
version	Ю RIP Â

30.1.15 ip rip send enable

RIP Э RIP ˘ ˃ **ip rip send enable** Â ˃ **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 ╟

30.1.16 ip rip send version

Ня RIP Э RIP ˘
¢ **ip rip receive version** Â ¢ **no** Â

ip rip send version [**1**] [**2**]

no ip rip send version

ð Ô

1	^ ┘ ~ RIPv1 Â
2	^ ┘ ~ RIPv2 Â

ð Ô

и ┘ ¤ **version** ¢ Â

ð ٪ Ô

Â

ð Ô

٪ ˘ ⅄Л **vesion** ٪ Â ٪
RIP ˘ ⅄Л ⅄ RIPv1 RIPv2
Â ٪ a ˘ ⅄ ¤ version Â

ð Ô

ЛЬЮ ˘ Fastethernet 0/0 ⅄Л RIPv1 RIPv2
Â

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

ð ٪Ô

٪	
version	Ⱶ RIP Â

30.1.17 ip rip v2-broadcast

RIP version 2 Л Э ˘ ⅄
Л ٪ **ip rip v2-broadcast** ٪Â ٪ no
Â

ip rip v2-broadcast

no ip rip v2-broadcast

ð Ô

٪

ð Ô

˘ ⅄ ¤ **version** ٪ Â

ð ٪ Ô

Â

ð Ô

٪ ˘ ⅄Л **vesion** ٪ Â ٪
RIP ˜

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

ð ¾Ô

¾	
version	Ⱶ RIP Â

30.1.18 ip split-horizon (RIP)

RIP ˫ ˘ ¾ **ip split-horizon** Â Ă 5 " € ə

¾	
auto-summary	RIP ╟

30.1.20 network (RIP)

Ю RIP ˘ ¾
network Â ¾ **no** Ю Â

network *network-number* [*wildcard*]

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

ð Ô

network-number	Л Â Л й Л˘ IP Л RIP Â
wildcard	Ю IP Æ˘ 0 ¬ ˘ 1 a Â

ð Ô

ð ¾ Ô

Â

ð Ô

Л Л Л *network-number* *wildcard* ˘ б RIP Â

wildcard ˘ RGOS ˘ б RIP Â

RIP Ю ˘ Л Л RIP ˘ RIP Â

ð Ô

Л Ю ˘ Ю б RIP ч Л˘ 192.168.12.0/24 172.16.0.0/24 б RIP '

```
Ruijie(config)# router rip
Ruijie(config-router)# network 192.168.12.0
Ruijie(config-router)# network 172.16.0.0 0.0.0.255
```

30.1.21 neighbor (RIP)

ﻫ RIP IP ˘ ⅃ Л ٦ **neighbor** Â

٦ **no** ﻫ Â

neighbor *ip-address*

no neighbor

ð Ô

ip-address IP Â S • î,ý-ÓKÂ5% Þ! <F¼-Ñ€’¯!¸&„ Ä< y Ê ,ýôr µ

interface-number	Ñ

ð Ô

offset Â

ð ¾ Ô

Â

ð Ô

RIP ¿ offset-list Ñ
offset-list RIP ¶ offset-list metric

ð Ô

ÑÙÞ ˇ acl 7 RIP metric ¶ 7 Â

```
Ruijie(config-router)# offset-list 7 out 7
```

ÑÙÞ ˇ fastEthernet1/0 ˉ 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
```

30.1.23 output-delay

¿ RIP ˇ ¾
output-delay ¾ **no** ¿ Â

output-delay *delay*

no output-delay

ð Ô

delay

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
```

30.1.24 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

Â

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

30.1.25 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˘

ł OSPF ł ’

ł ISIS ł level-2 ’

è Ю ł ’

ł л metric ѝ 1’

a route-map Â

ð ʒ Ô

ð Ô

ʒ ł RIP Â

ł ˘ л

˘ ѝ a ɹ a ɹ ÂRIP

˘ OSPF ˘

ɹ Â ł ˘ ˘

ł Â

ł **isis** ˘ a level ˘ ł level-2

˘ ł ˘ level ˘ ł level

Â ˘ ѝ ˘ ɹ level 1, level 2 ˘

ѝ level-1-2 Â

ł **ospf** ˘ a match ˘ ł

ospf ’ л match ѝ match

˘ ł ʔ ł ’ no ʒ

match ѝ Â

ð Ô

ЛЪЮ ʒ ł RIP

```
Ruijie(config-router)# redistribute static
```

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RIP Â

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RIP ˘ Ⱨ Л Â Э ╟
˘ **async default routing** Â

ð Ô

ЛЬЮ ˘ RIP ˘
Â

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

ð ֽ Ô

ֽ	
network (RIP)	Ⱨ RIP Л Â

30.1.27 timers basic

RIP ˘ ֽ **timers basic** Â ֽ no Â

timers basic *update invalid flush*

no timers basic

ð Ô

update	˘ Л Â*update* Ⱨ ˘ *invalid Flush* Æ Â 30 Â
invalid	˘ Л ˘ ÿ Â*invalid* Ⱨ ╛ и Â и Ь ˘ ˘ ╛ и ˘ *invalid* ' *invalid* ˘ Æ Â*Invalid* и 180 Â

flush	˘ Л υ ˘ ÿ RIP *invalid* Â *flush* ˘ *invalid* Â *Flush* ѝ 120 Â

ð Ô

Ю˘ 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

Л ЮЮ ˘ 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

30.1.28 validate-update-source

RIP ˘ ˘
ֽ **validate-update-source** Â ֽ **no**
Â

validate-update-source

no validate-update-source

ð Ô

ֽ Â

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৶ Л RIP ˘ Â ѝ

RIP ˘ ৶ IP Â RIP cc81b[3d403fe>

ɹ ՈU RIPv1 RIPv2 ˇ RIPv1
Â

ð ३ Ô

Â

ð Ô

ꟾ RIP ʌ Â ɹ ՈU **ip rip receive version** à
ip rip send version ३ˇ RIP
ꟾ Â

ð Ô

ՈЮ ˇ RIP ʌ ѝ 2 Â

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

ð ३ Ô

३	
ip rip receive version	ꟾ RIP Э RIP Â
ip rip send version	ꟾ RIP Э RIP Â
show ip rip	**rip** Â

30.2

30.2.1 show ip rip

RIP ˇ **show ip rip** Â

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

ð Ô

vrf *vrf-name*	^ ɹ ~ VRF RIP

ð Ô

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ð ३ Ô

à à Â

ð Ô

ɻ RIP Ь à ţ à ţ 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
Outgoing update filter list for all interface is: not
set
Incoming update filter list for all interface is: not
set
Default redistribution metric is 2
Redistributing: connected
Default version control: send version 2, receive version
2
Interface            Send  Recv
FastEthernet 1/1      2     2
FastEthernet 1/0      2     2
Routing for Networks:
192.168.26.0 255.255.255.0
192.168.64.0 255.255.255.0
Distance: (default is 50)
```

ЛЬЮ ˘ vrf˝ RIP '

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

30.2.2 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 ˩ ˜ ⁄ Â
network-mask	Â ⁄ ˘

ð Ô

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˘ RIP
Â ⁄ ˩ ˙ ˘
≠ 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
```

ð ƻ Ô

ƻ	

show ip rip	Â

30.2.3 show ip rip external

RIP ‍ ˘ **show ip rip external** ৡ Â

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

ð Ô

bgp | connected | isis | ospf | static	ˆ ˩ ˜ ‍
vrf *vrf-name*	ˆ ˩ ˜ VRF RIP

¾	
show ip rip	Â

30.2.4 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

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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 ╠, ѫ ৡ 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 ৡ Ô

ৡ	
show ip rip	Â

30.2.5 show ip rip peer

RIP й ˝ RIP (RIP)
˘ Л∪ ˘ й RIP ˘
RIP ˘ **show ip rip peer** Â

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

ð Ô

ip-address	ˆ ˩ ˜ RIP
vrf *vrf-name*	ˆ ˩ ˜ VRF RIP

ð Ô

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à à Â

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ð Ô

ЛЬЮ ˘ RIP Â

```
Ruijie# show ip rip peer
Peer 192.168.3.2:
  Local address: 192.168.3.1
  Input interface: GigabitEthernet 0/2
  Peer version: RIPv1
  Received bad packets: 3
  Received bad routes: 0
  BFD session state up
```

ð ¾Ô

¾	
show ip rip	Â

ð ¼ Ô

ð Ô

31 OSPF

31.1

31.1.1 area

ɯ ˇ ɂ **no** OSPF ɯ Â

area area-id

no area area-id

ð Ô

area-id	OSPF ɯ ʌ Â ɯ ʌ ɻ Ո ⁸ ˇ ≠ ɻ Ո IP Â

ð Ô

OSPF ɯ Â

ð ɂ Ô

Â

ð Ô

ɻ Ո ɂ **no** ˇ OSPF ɯ ɯ ˇ **area authentication** à**area default-cost** à**area filter-list** à **area nssa** ɯ ɂ Â

Ю Ю˘ OSPF ɯ '

1. ў ɯ ˇ Â ˮI ˇ ў ɯ Â
2. ɯ ˇ **network area** ɂ Â ˮI ╗ ɯ ɂˇ ɯ Â

ð Ô

ՈЮ ˇ OSPF ɯ 2 '

```
Ruijie(config)# router ospf 2
Ruijie(config)# no area 2
```

ð ɂ Ô

ৡ	
network area	⊮ OSPF˘ ⎍ OSPF ש

ð ⊀ Ô

ð Ô

31.1.2 area authentication

OSPF ש ˘ ৡ **area authentication** Â ৡ **no** OSPF ש Â

area *area-id* **authentication** [**message-digest**]

no area

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 ¾ Ô

¾	
ip ospf authentication-key	Нж OSPF ¾ Â
ip ospf message-digest-key	Нж OSPF MD5 ¾ Â
area virtual-link	Нж Â

ð ⁄ Ô

ð Ô

31.1.3 area default-cost

Нж STUB ш NSSA ˆ OSPF
˜ ˘ ¾ **area default-cost** Â ¾ **no**
Â

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

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

ð Ô

area-id	STUB ш NSSA
cost	STUB ш NSSA Â

ð Ô

ѝ˝ Â

ð ʒ Ô

Â

ð Ô

ʒ ABR˜ ш ˜ Э ˘ з ABR
STUB ш ˆ ѝ ˜ NSSA Â ABR
˘ ш ˘ ⅄ ш Â

OSPF ш ѝ 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 ABR Э Â

ð Ô

ЛЬЮ ʒ˘ ѝ 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 ѝ Â
area nssa	OSPF ш ѝ NSSA ш

ð ⅄ Ô

ð Ô

31.1.4 area filter-list

ABR Э ˘ a ⅄ 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	NSSA ш ш /ı Â
no-redistribution	ˆ ˩ ˜ nssa ABR ˇ ˦ ʒ ш a nssa ш ˇ ˩Л Э Â
default-information-originate	ˆ ˩ ˜ 7 LSA nssa ш ˇ NSSA ABR ASBR Э Â
no-summary	ˆ ˩ ˜ nssa (ABR) Ь LSA nssa ш Â

ð Ô

Ⱶ NSSA ш Â

ð ʒ Ô

Â

ð Ô

default-information-originate Type-7 LSA˘ nssa ABR ASBR Э ˇ ABR Э ˇ Type-7 LSA ˇ ASBR Э(˩ ≠ a ABR) ˇ Type-7 LSA Â

no-redistribution ASBR Э OSPF redistribute ʒ è a NSSA ш Â NSSA ASBR ABR ˇ ˩Л nssa Â

ѝ NSSA ш ˆ LSA˜ ˇ ˩Л ABR Э no-s mmary ˇ ABR NSSA ш summary LSAs˜ Type-3 LSA˜ Â

ı **area default-cost** NSSA ш ABR Э Â ʒ ш NSSA ш Â Ю˘ NSSA ѝ 1 Â

ð Ô

ЛЮ ˇ ш 1 ѝ ˇ ш 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 nssa
```

ð ¾ Ô

¾	
area default-cost	Ⱶ NSSA ˆ OSPF ˜ Â

ð ⊿ Ô

ð Ô

31.1.6 area range

OSPF ʁ ˘ ¾ **area range** Â ¾ **no** ˘ **no** б **cost** ⊿ Л ˘ a Â

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

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

ð Ô

area-id	OSPF ʁ /ı Â ʁ /ı ⊿ Л ⁸ ˘ ≠ ⊿ Л IP Â
ip-address	Ⱶ Â
advertise | **not-advertise**	Ⱶ Ὼ ˘ Ὼ
cost *cost*	Â

ð Ô

ʁ Â

б RFC1583 ˘
RFC1583 ˘ cost ˘
cost Â

ð ¾ Ô

Â

ð Ô

ʒ ABR Э ˘ ʁ
˘ ʌ è ʁ Â ѝ ʁ
˘ ʁ Э έ ˘ ʁ
Â з ɻ Л advertise not-advertise

ᾱ Ὼ ˘ ˘ Ὼ Â

ɻ Л Ⱶ ʁ ʒ˘ OSPF
˘ ˘ Â

ð Ô

ЛЬЮ ˘ ʁ ˝ 172.16.16.0/20 Â

```
Ruijie(config)# router ospf 1
Ruijie(config-router)# network
```

ð ʒ Ô

Â

ð Ô

OSPF **area stub** ʒ Â ABR
Ь (LSA)ʾ 1˜ 1˘ LSAʼ 2˜ 2˘
LSAʼ 3˜ 3˘ LSA Â ÿ ˘
˙ OSPF ˘ ABR
Â a ˙ OSPF Â

˘ ABR Э **area stub** ʒ ˘
no-summary Â ш ˘ Л
ABR Â

OSPF ш й ч ʒ **area stub** **area default-cost** Â Э˘ **area stub**
ʒ˘ **area default-cost** ʒ ABR Э Â **area default-cost**
ʒ Ьж ˆ ˜ Â

ð Ô

ЛЮ ˘ ш 1 й ˘ ш
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
```

ð ʒ Ô

mit-interval *seconds*] [**transmit-delay** *seconds*] [[**authentication-ke y** *key*] | [**message-digest-key** *key-id* **md5** *key*]]
no area *area-id* **virtual-link** *router-id*

ð Ô

area-id	OSPF ʁ ʌ Â ʁ ʌ ˩ Л∪ [8] ˘ ≠ ˩ Л∪ IP Â
router-id	Â ˩ Л∪ show ip ospf ȝ Â
dead-interval *seconds*	ˆ ˩ ˜ Ⱶ ˘ Л∪ ѝ æ˘ ѝ 40 Â б Â
hello-interval *seconds*	ˆ ˩ ˜ OSPF Hello ˘ Л∪ ѝ æ˘ ѝ 10 Â б Â
retransmit-interval *seconds*	ˆ ˩ ˜ OSPF ˆ LSA˜ ˘ Л∪ ѝ æ˘ ѝ 5 Â Э Â
transmit-delay *seconds*	ˆ ˩ ˜OSPF ˆ LSA˜ ˘ Л∪ ѝ æ˘ ѝ 1 Â ╗ LSA ˘ LSA ˘ LSA [9] Â
authentication-key *key*	ˆ ˩ ˜ Ⱶ OSPF Â Â service password-encryption ȝ ˩ Л∪ Л∪╗ Â
message-digest-key *key-id* **md5** *key*	ˆ ˩ ˜ Ⱶ OSPF MD5 Â MD5 Â service password-encryption ȝ ˩ Л∪ Л∪╗ Â
authentication	˘ Â

retransmit-interval ' 5 '

transmit-delay ' 1 '

a ;

area authentication	OSPF ʁ Â
show ip ospf	OSPF ˘ Â

ð ⊀ Ô

ð Ô

31.1.9 auto-cost

ʒ ╟ ʒ˙ ╥ ⊀ ˘ ╟
ʒ˙ ˘ ʒ **no** ⊣ Л∪ ╟ ʒ˙ ╥ ˘ ⊣ Л∪
Â

auto-cost [**reference-bandwidth** *ref-bw*]

no auto-cost [**reference-bandwidth**]

ð Ô

ref-bw	Â Л∪ Mbps ѝ Æ˘ : 1-429496Ø712.382912 Tc: 1-4294

Ruijie(config-router)# **auto-cost reference-bandwidth** *10*

ð ¾Ô

¾	
show ip ospf	ospf

ð ¼ Ô

ð Ô

31.1.10 clear ip ospf process

OSPF Â

clear ip ospf (*process-id*) **process**

ð Ô

process-id	˘ OSPF Â /I ˘ OSPF Â

ð Ô

RFC2328 Â

ð ¾ Ô

Â

ð Ô

Æ OSPF ˘ ˘ ' ЛU
¾ ˘ '

ð Ô

ЛUЮ ¾ OSPF 1

Ruijie# **clear ip ospf** *1* **process**

ð ¾Ô

ð ¼ Ô

ð Ô

31.1.11 compatible rfc1583

¿ AS ˘ ˘
¾ RFC1583 ″I RFC2328
″I Â

commpatible rfc1583

no commpatible rfc1583

ð Ô

¾	

ð Ô

RFC1583 Â

ð ¾ Ô

Â

ð Ô

ЛυЮ ˘ rfc 2328 Â

```
Ruijie(config)# router ospf 1
Ruijie(config-router)# no commpatible rfc1583
```

ð ¾Ô

¾	
show ip ospf	ospf

ð ¿ Ô

ð Ô **no default-informTT1on**

always	^ ȷ ~ OSPF ˚ ˘ a Â
metric *metric*	^ ȷ ~ ˘ ѝ 1 Â
metric-type *type*	^ ȷ ~ Â OSPF ч ' 1˘ a ȷ Э a ' 2˘ Â 1 2 ȷ Â ѝ 2 Â
route-map *map-name*	route-map ȷ , route-map

ð Ô

a Â

ð ȝ Ô

Â

ð Ô

redistribute default-information ȝ ˘ OSPF ╟ ȷ ѝ ASBR˘ ~ Â ASBR a ╟ ˘ OSPF Â ASBR ˘ **default-information originate** ȝ Â

always ˘ OSPF a ˘ Â a ˘ ˘ ȷ Л **show ip ospf database** OSPF ˘ ѝ 0.0.0.0 Â OSPF **show ip route** ȝ˘ ȷ Л Â

˘ **default-information originate** ȝ Ѭ a ȝ **default-metric** Â

OSPF ч ˘ 1 ȷ˘ 2 a ȷ Â ч ˘ ȷ ˘ 1 2 ˝I ˘ Л **show ip route** 1 Â

STUB ѡ a ȷ Л Â

ð Ô

ЛЮ ˘ OSPF ˘ OSPF ˘ ѝ 1˘ ѝ 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 ¾Ô

¾	
show ip ospf database	OSPF Â
show ip route	IP Â

ð Ô

ð Ô

31.1.13 default-metric

OSPF ¦ ˘ ¾
default-metric Â ¾ **no** Â

default-metric *metric*

no default-metric

ð Ô

metric	ЊЋ OSPF ¦ Â

ð Ô

ѝ 20 Â

ð ¾ Ô

Â

ð Ô

default-metric ¾ б **redistribute** ¾ ˘ Л Л¦ Â

default-metric ¾ ˘ Л **default-information originate** OSPF a Â

ð Ô

ЛЊЮ ˘ OSPF ¦ ѝ 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

31.1.14 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 ˘ и 110
inter-area <*1-255*>	ш ˘ и 110
external <*1-255*>	˘ и 110

ð Ô

и 110 Â

ð ¯ Ô

OSPF Â

ð Ô

OSPF a ¬ a ¬ ˘ ¯ Â

ð Ô

ЛЬЮ ˘ OSPF й 160

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

ð ¾Ô

ð ¼ Ô

ð Ô

31.1.15 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

й ˘ 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 ʒ Ô

ð ˬ Ô

ð Ô

31.1.16 distribute-list out

ǂ ˘ ℼ **redistribute** ʒ

distribute-list {l*istname* | **gateway** *plist-name* | **prefix** *plist-name*} **out** [**bgp** | **connected** | **isis** *area-tag* | **ospf** *process-id* | **rip** | **static**]

no distribute-list {l*istname* | **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** | **static**]	

ð Ô

ѝ ˘ Â

ð ʒ Ô

Â

ð Ô

distribute-list out б **redistribute route-map** ʒ ˘ ÿ è ǂ OSPF ˘ a ǂ ˘ б **redistribute** ʒ ÂACL prefix-list a , ACL , a Ѧ prefix-list Â

ð Ô

Ю ǂ

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

ð ३Ô

ð ✓ Ô

ð Ô

31.1.17 enable mib-binding

3	
show ip ospf	OSPF
enable traps	OSPF TRAP 7

б error traps ˇ ⅃ Л৬

Ю error traps '

ifauthfailure

ifconfigerror

error

		б lsa traps ˘ ⅃ Л Ь Ю lsa traps '
	lsa	**lsdbapproach** **overflow** **lsdboverflow** **maxagelsa** **originatelsa**

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 Ï¸Ì •À¾ Лυ

ð Ô

¯ GR Help ˘ ˘
Grace-LSA è ˘ GR Help ˘
Grace-LSA ˘ ù GR Helper ╠ Â
disable GR ╠ Â

ù GR Helper ˘ Ю a ┘ ˘
┘ ˘ ≠ GR Â
GR ˘ ┘ ˘ ┘ Л
strict-lsa-checking internal-lsa-checking ╟ ˘ è
LSA(types 1-5,7) ˘ AS
LSA(types 1-3) Â Ю a
╟ LSA ˘ ù ┘ ╟ GR ˘ ÿ
æ Â

ð Ô

Ю OSPF 1 GR ╠ Л
┘ '

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

ð ¯ Ô

¯	
graceful-restart	OSPF

ð ˘ Ô

ð Ô

RGOS10.3(5b1), ¯

31.1.20 ip ospf authentication

¯ ˘ **no** ┘ Л ù Â

ip ospf authentication [**message-digest** | **null**]

no ip ospf authentication

ð Ô

message-digest	Э MD5 ¶ Â
null	a Â

ð Ô

Э , Э ш
Â

ð ¯ Ô

Â

ð Ô

¯ Л a .
no ˘ ш
Э ā ˘ и **null** ¸ и
a , Э ш , ¨І
Э Â

ð Ô

ЛЬЮ ˘ FastEthernet 0/0 OSPF и 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 ¯ Ô

¯	
area authentication	OSPF ш Нж Â
ip ospf authentication-key	OSPF Â
ip ospf message-digest-key	OSPF MD5 Â

ð Л Ô

ð Ô

31.1.21 ip ospf authentication-key

OSPF ˘ ¯ **ip ospf authentication-key** Â ¯ **no** Â

ip ospf authentication-key *key*

no ip ospf authentication-key

ð Ô

ð ¼ Ô

ð Ô

31.1.23 ip ospf database-filter all out

¾ a LSA ˘ a Э LSA
, ¾ **no** ¼Л

ip ospf database-filter all out

no ip ospf database-filter

ð Ô

¾	

ð Ô

Т , ¼Л Э LSA Â

ð ¾ Ô

Â

ð Ô

Э LSA , ¼Л Э Т
.

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 ¼ Ô

ð Ô

31.1.24 ip ospf dead-interval

OSPF ˘ ¾ **ip ospf dead-interval** Â ¾ **no** Â

ip ospf dead-interval *seconds*

no ip ospf dead-interval

ð Ô

seconds	ЊЖ ˘ Л∪ ѝ Æ Â

ð Ô

ѝ **ip ospf hello-interval** " Â

ð ʒ Ô

Â

ð Ô

OSPF Hello Â OSPF ˘
Hello ˘ ÿ
Â ѝ hello 4 ˘ hello
˘ ╟ Â

ʒ ˩ Л∪ OSPF ˘ ↑ Â
ч '

- ˘ a hello '
- ˩ Э Â

ð Ô

ЛЬЮ ˘ serial 1/0 OSPF ѝ
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 ʒ Ô

ʒ	
ip ospf hello-interval	OSPF Hello Â

ð ˩ Ô

ð Ô

31.1.25 ip ospf disable all

a Ą ospf Â

ip ospf disable all

no ip ospf disable all

ð Ô

ʒ

ð Ô

ð ʒ Ô

Â

ð Ô

ʒ **network area** ˘ ʒ ˇ
network ≠ a Ą ospf Â a
OSPF ˘ ≠ a б OSPF Â

ð Ô

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

ð ʒ Ô

ð ˇ Ô

ð Ô

31.1.26 ip ospf hello-interval

OSPF Hello ˘ ʒ **ip ospf hello-interval** Â ʒ **no** Â

ip ospf hello-interval *seconds*

no ip ospf hello-interval

ð Ô

seconds	OSPF hello ˘ Л ь æ Â

ð Ô

- Л 10 ’
- PPP à HDLC 10 ’

- 10 ’
- à .25 30 Â

ð ৡ Ô

Â

ð Ô

hello hello Â ˘ OSPF
ل ≠ ˘ ╗ Âل Э
hello Â ˘
hello a Â

ð Ô

ЛЬЮ ˘ 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 ৡ Ô

ৡ	
ip ospf dead-interval	OSPF Â

ð ﻝ Ô

ð Ô

31.1.27 ip ospf message-digest-key

OSPF MD5 ˘ ৡ **ip ospf**

ð Ô

MD5 Â

ð ʒ Ô

Â

ð Ô

ip ospf message-digest-key ʒ ˘ OSPF
Â a ˘ ч ⊀ a OSPF
˘ ≠ a Â

a ⊀ ⊀Л a ˘ ⊀ Э
˘ Â ⊀
Â

OSPF ʊ ˘ ʒ **area**
authentication Â Э ≠ ⊀Л ,
Ю ʒ **ip ospf authentication** , ʊ
˝I ⊀ .

RGOS ˚ MD5 ˘ ˝I ╗
⊀ Â ╗ OSPF MD5 ˘
ŷ è ˘ ⁑ a ⊀
OSPF ˘ Â
⊀˘ ⊀Л Â

ð Ô

ЛЪЮ ˘ FastEthernet 0/0 ╗ OSPF ˘
⊀ ŷ˜ ˘ ŷ 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 ʒ Ô

ʒ	

area authentication	OSPF ש	ⅎ Â

ip ospf authentication

OSPF ˘ ʒ **ip ospf network** Â ʒ **no** Â

ip ospf networkķ **broadcast** ¸ **non-broadcast** ¸ **point-to-multipoint** [**non-broadcast**]¸ **point-to-point**ʼ

no ip ospf networkķ **broadcast** ¸ **non-broadcast** ¸ **point-to-multipoint** [**non-broadcast**]¸ **point-to-point**ʼ

ð Ô

broadcast	OSPF ѝ Â
non-broadcast	OSPF ѝ ˘ NBMA Â
point-to-multipoint [**non-broadcast**]	OSPF ѝ Â , non-broadcast ѝ Â
point-to-point	OSPF ѝ Â

ð Ô

- ' PPP à SLIP à à X.25 ,
- NBMA ' ˆ ˜ à X.25 ˆ ˜ ,
- ' Л∪ '
- ѝ Â

ð ʒ Ô

Â

ð Ô

a ⅄ ˘ OSPF ⍦ ѝ Ь '

- ˆ Л∪ ˘ ʒ ˘ FDDI˜
- ˆ ˘ X.25˜
- ˆ HDLC˜ PPP˜ SLIP˜

è ˘ OSPF a ⅄ ⍦ ѝ ч '

- (NBMA) ÂNBMA ˘ ˘ SVC ˆ X.25˜ ˘ PVC˜ ˜ ÂOSPF NBMA Э б Э ˘ ˆ Designated Router˜ ˘ NBMA Â

- Â a ˘ OSPF Â ˘ OSPF ˘ Л∪ Â ˦ и , .

a ж˘ ˩Л∪ и 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

/ł à Л∪ X.25 ˘ IP ˘ broadcast .

ð Ô

ЛЬЮ ˘ и ˘ 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 ˘ и ˘ 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 ˘ и ˘ DR/RDR˜ ˛ ÂЛЬЮ ˦ a Э ˆ ⁸ и 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 ¾ Ô

¾	
dialer map ip	Ì IP б /Ì /Ì Â
frame-relay map	Ì IP б DLCI Â
neighbor OSPF	Ì IP ˘ NBMA Â
X25 map	Ì IP б X.25 Â

ð Ì Ô

ð Ô

31.1.30 ip ospf priority

OSPF ″I ˘ ¾ **ip ospf priority** Â
¾ **no** Â

ip ospf priority *priority*

no ip ospf priority

ð Ô

Priority	OSPF ″I Â

ð Ô

″I ¸″ Â

ð ¾ Ô

Â

ð Ô

OSPF ″I hello Â OSPF
DR/BDR ˛ ˜ ˘ ″I
˘ ¸ DR BDR Â ″I ˘
¸ DR BDR Â ″I ¸˚ ˘ a Ì ¸ DR
BDR Â ¾ OSPF **broadcast** **non-broadcast**
Â

˜ :

DR BDR ѫ ″I a ˘
ЮDR BDR ″I .

ð Ô

ЛЬЮ ˘ fastethernet 0/0 ″I ѝ 0 Â

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

˘ Л∪ a ˘ Э˘
Л∪ Â LSU area
virtual-link ¾ retransmit-interval ЊЖ Â

ð Ô

ЛUЮ ˘ serial 1/0 LSU ѝ 10 Â

```
Ruijie(config)# interface serial 1/0
Ruijie(config-if)# ip ospf retransmit-interval 10
```

ð ¾ Ô

¾	
area virtual-link	ЊЖ OSPF Â

ð Ô

ð Ô

31.1.32 ip ospf transmit delay

ЊЖ OSPF LSU ˘ ¾ **ip ospf transmit delay** Â ¾ **no** Â

ip ospf transmit delay *seconds*

no ip ospf transmit delay

ð Ô

Seconds	ЊЖ OSPF LSU ˘ Л∪ ѝ æ Â ѝ 1 Â

ð Ô

ѝ 1 Â

ð ¾ Ô

Â

ð Ô

LSU ˘ LSAs˜ ~ Age
¶˘ ¶ ¾ **ip ospf transmit delay** ЊЖ Â
˘ æ ˘
Â LSU ˘ **area**
virtual-link ¾ **retransmit-interval** ЊЖ Â

RGOS ˚ Age 3600 LSA˘ ˘
9 ˘ LSA ÿ Â

ð Ô

ЛЬЮ ˘ serial1/ 0 ѝ 5 Â

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

ð ȝ Ô

ȝ	
area virtual-link	ІѪ OSPF Â

ð ⊿ Ô

ð Ô

31.1.33 log-adj-changes

ȝ ⊿ ˘ ȝ **no default** ⊿Л ╖ Â

log-adj-changes [**detail**]

no log-adj-changes [**detail**]

ð Ô

ꝛ	
show ip ospf	ospf Â

ð ⊿ Ô

ð Ô

31.1.34 max-concurrent-dd

⊿ DD Â

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

ð Ô

<1-65535>	DD

ð Ô

ὺ 5Â

ð ꝛ Ô

Â

ð Ô

б ⊿ ˘ ὲ ⊿ ˘ ꝛ˘
⊿ ⁸ OSPF ⊿ DD Â

ð Ô

ЛЪЮ ˘ DD ὺ 4Â

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

ð ꝛÔ

ð ⊿ Ô

ð Ô

31.1.35 neighbor

Ⱶ OSPF ˘ ꝛ **neighbor**Â ꝛ **no**
Â

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

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∪ 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 ¢ Ô

¢	
ip ospf priority	OSPF ¨I Â
ip ospf network	OSPF

ð ¸ Ô

ð Ô

31.1.36 network area

Ⱨ OSPF˜ Ɲ OSPF ʁ ˇ
¢ **network area** Â ¢ **no** OSPF ʁ Ⱨ Â

network *ip-address wildcard* **area** *area-id*

no network *ip-address wildcard* **area** *area-id*

ð Ô

ip-address	IP Â

wildcard ¸ÀÞDËPS2Q@BÏ IP Æ ˚ ˛ ˇ ˝
area a M Ź

ЛЬЮ ˘ ЊЖ ' ш ' 0˝ 1˘ 172.16.16.0 Â IP 192.168.12.0/24 ЊЖ ш 1˘ IP 172.16.16.0/20 ЊЖ ш 172.16.16.0˝ è ЊЖ 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 ¾ Ô

¾	
router ospf	OSPF Â

ð ¼ Ô

ð Ô

31.1.37 overflow database

¾ 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 ¾ Ô

Â

ð Ô

OSPF ˘ **hard** ˘ a OSPF˝ ˘ **soft**

ð Ô

ЛЬЮ ¦ LSA 10 ˘ OSPF 10 Â

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

ð ¦Ô

ð ⅄ Ô

ð Ô

31.1.38 overflow database external

¦ external LSA б ÿ
Â

overflow database external *max-dbsize wait-time*

no overflow database external

ð Ô

max-dbsize	external lsa ˆ ⅄ AS ⅄˜ ˘ ⅄ ' 0-2147483647 Â
wait-time	ÿ ˘ ⅄ ' 0-65535 Â

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a ⁸ external-LSA Â

⁸ external-LSA ˘ external-LSA
⅄˘ a Ą Â

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external-LSA *max-dbsize* ˘ ˘
Ю˘ a Ą╖ external-LSA˘ external-LSA Â
wait-time ⅄˘ ˘ ╖ external-LSA Â

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

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31.1.39 overflow memory-lack

ꝛ a OSPF OVERFLOW Â ꝛ
no ℸ Â

overflow memory-lack

no overflow memory-lack

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no	a OSPF OVERFLOW ℸ Â

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a Ю OSPF OVERFLOW Â

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OSPF OVERFLOW ў ˘ й
a Ѧ Â
ℸ ˘ OSPF OVERFLOW ˘ ⊿
Âй ˘ OSPF
NULL ˘ ÿ æ ˘
OVERFLOW Ю Â
⊿ Л clear ip ospf process ꝛ Æ OSPF ˘ OSPF
OVERFLOW Â
no a OSPF a OVERFLOW ˘ ⊿
˘ ˘ OSPF
˘ Â

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OSPF a Ю a OVERFLOW '

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

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clear ip ospf process	OSPF Æ
show ip protocols ospf	OSPF

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ð Ô

31.1.40 passive-interface

ʒ ѝ ╟ Â
ʒ **no** Â

passive-interface [**default** | *type number*]

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

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type number	ѝ ╟ Â
default	ѝ ╟ Â

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Ю ѝ ╟ , OSPF

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ѝ è ╟ ˉ ˘ ⊣ Л∪
ѝ ╟ Â

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ЛЮ ˘ serial 1/0 ѝ ╟ Â

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

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ʒ	
show ip ospf interface	

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ð Ô

ł ˘ BGP metric ŕ 1˘ è LSA metric ŕ 20ʻ

ł **isis** ˘ a level ˘ ł level-2 ˘ ł ˘ level ˘ ł level Â ˘ ŕ ˘ ⊿ level 1, level 2 ˘ ŕ level-1-2 Â Â

ł **ospf** ˘ a match ˘ ł ospf ’ ⊿ match ŕ match ˘ ł ˥ ’ no ʒ match ŕ Â Â

ł ˘ route-map ˘ route-map match ł ˥ ’ ł OSPF ISIS ˘ ł match level ˘ ‘Ą route-map Â

ð Ô

ЛЬЮ ʒ ł OSPF

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

Show run Ю’

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

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ð ⊿ Ô

ð Ô

31.1.42 router ospf

OSPF ˘ ʒ **router ospf** Â ʒ **no** Ьѫ OSPF Â

router ospf *process-id* [**vrf** *vrf-name*]

no router ospf *process-id*

ð Ô

process-id	ospf /I
vrf-name	VRF ˘ OSPF VRF

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a OSPF Â

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RGOS10.1 Э ¶ ' /I˘ и ospf Â
a ¬ ospf ˘ ¬Л∪ и ч a Â

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ЛυЮ ˘ **vrf** *vpn_1* OSPF 10 Â

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

ð ¾Ô

¾	
show ip protocols	Â
show ip ospf	ospf Â

ð ¬ Ô

ð Ô

31.1.43 router-id

ID, ¾ **no** ¬Л∪ Router ID˘ Router ID Â

router-id *router-id*

no router-id

ð Ô

router-id	ID,Л∪ IP Â

ð Ô

OSPF ip ŋ Â

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ɻЛυ ip ŋ ˘ ɻ

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, Лυ a ў ɻ ˘ Лυ ’

ɻ LSA . Лυ OSPF ˘

˘ ӂ ″l ˘

≠ ɻЛυ loopback ˘ ospf Â

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ЛυЮ ˘ router-id ŋ 0.0.0.36 Â

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

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ʒ	
show ip protocols	Â

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31.1.44 summary-address

OSPF ˘ ʒ

summary-address Â ʒ **no** ҂ӂ Â

summary-address *ip-address net-mask* [**not-advertise | tag** *<0-4294967295>* |]

ð Ô

ip-address	IP Â
net-mask	Â
not-advertise	a Ѽ ˘ ŋ Ѽ Â

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ÿ è ǂ ˘ OSPF ˘
ǂ Л OSPF Â
˘ ˩Л
˘ ÿ Â

б **area rang** ʒ a ˩˘ area range OSPF ʁ ˘
summary-address OSPF Â

NSSA ʁ˘ **summary-address** ʒ NSSA ABR Э
˘ з ǂ Â

ð Ô

ЛЮ 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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ʒ	
area range	OSPF ʁ Э Â

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31.1.45 timers lsa-group-pacing

ʒ LSA ǂ ˩ ⁹ Л
˘ ʒ **no** Â

timers lsa-group-pacing *seconds*

no timers lsa-group-pacing

ð Ô

spf-delay	⊮ SPF ˘ Л∪ ѝ Æ Â OSPF ⅄ ˘ Л˘ SPF Â
spf-holdtime	⊮ ч SPF ˘ Л∪ ѝ Æ Â ˘ ч

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31.1.47 timers throttle spf

OSPF ɹ ˘ SPF à ч
SPF à ˘ ʒ
timers throttle spf Â ʒ no Â

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

no timers throttle spf

ð Ô

spf-delay	Ⱨ SPF ˘ Л ѝ Æ˘ ɻ ' 1-600000 Â OSPF ɹ ˘ SPF spf-delay ɻ Â
spf-holdtime	Ⱨ ч SPF ˘ Л ѝ Æ˘ ɻ ' 1-600000 Â
spf-max-waittime	Ⱨ ч SPF ˘ Л ѝ Æ˘ ɻ ' 1-600000 Â

ð Ô

spf-delay' 1000 '

spf-holdtime' 5000 '

spf-max-waittime' 10000 Â

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spf-delay ÿ ɹ SPF ˘ Â
SPF γ SPF ѝ
spf-holdtime˘ ɻ˘ SPF ѝ Э
ч ˘ *spf-max-waittime* ɻ˘ a Ạ ╗ Â
ч SPF ˘ Ⱨ SPF
ÿ *spf-holdtime* Â

spf-delay *spf-holdtime* ɻ Л Л ╗ '
spf-max-waittime ɻ Л Л SPF ˘ ɻ Л
ɻ Â

б **timers spf** ҳ ˘ ҳ ˘ ⅃Л╗ SPF
˘ ⅃Л ⅃ SPF
˘ Л **timers throttle spf** ҳ 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

OSPF ˘ ֽ **show ip ospf** Â

show ip ospf [*process-id*]

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process-id	ospf /ı

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ֽ ˩ Л∪ OSPF Â

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Л∪Ю ѝ **show ip ospf** ֽ '

```
Ruijie# show ip ospf
Routing Process "ospf 1" with ID 1.1.1.1
Process uptime is 4 minutes
Process bound to VRF default
Conforms to RFC2328, and RFC1583Compatibility flag
isenabled
Supports only single TOS(TOS0) routes
Supports opaque LSA
This router is an ASBR (injecting external routing
information)
SPF schedule delay 5 secs, Hold time between two SPFs
10 secs
LsaGroupPacing: 240 secs
Number of 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”,

```
Ю0 -1.4457 7126 area cnform
```

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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Incomming current DD exchange neighbors	ˇ incomming exstart
Outgoing current DD exchange neighbors	ˇ 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 ,Ӈ ѫ Ă

NSSA Translator State	NSSA LSA й External LSA' NSSA ш˘ з ABR OSPF '
BFD is enabled	OSPF б BFD ╟

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31.2.2 show ip ospf border-routers

ABR/ASBR OSPF ˘ ֳ

show ip ospf border-routers Â

show ip ospf [*process-id*] **border-routers**

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process-id	ospf Л

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ֳ˘ ⊀Л∪ ABR ASBR OSPF ÂOSPF a ⊀ **show ip route** ˘ OSPF й OSPF ˘ a Â

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ЛЮй **show ip ospf border-routers** ֳ '

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

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

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

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Codes	ֳ Ⱨ Âi ш ˘ I ш Â
I	й ш Â

1.1.1.1	OSPF Â
[2]	ˆ cost˜ Â
via 10.0.0.1	Ю Â
FastEthernet 0/1	Â
ABR, ASBR	˘ ABR ASBR ч ˘ ㄴ Л ㄴ ABR ASBR Â
Area 0.0.0.1	˗ ш Â
select	ASBR ˘ select Â

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31.2.3 show ip ospf database

OSPF ˘ ३ **outer3.1714 0 TD0 T.8 4**

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

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

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

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

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

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

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

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

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

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

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Area-id	ˆ ˩ ˜ Ш Ո
adv-router	ˆ ˩ ˜ Ώ
link-state-id	ˆ ˩ ˜ OSPF Â
self-originate	ˆ ˩ ˜
maxage	ˆ ˩ ˜ LSA
router	ˆ ˩ ˜ OSPF Â
network	ˆ ˩ ˜ OSPF Â
summary	ˆ ˩ ˜ OSPF Â
asbr-summary	ˆ ˩ ˜ ASBR Â
external	ˆ ˩ ˜ OSPF Â

nssa-external	ˆ ˩ ˜ OSPF Â
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 й Â
Net Link States	ЛЬЮ й Â
Summary Net Link States	ЛЬЮ й Â
NSSA-external Link States	ЛЬЮ й
AS External Link States	ЛЬЮ й 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	ˇ ЛЬ ѝ Æ Â
Network Mask	Â
TOS	TOS ˇ ѝ 0Â
Metric	Â

ЛЬЮ ѝ **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

Length	˘ Л υ ѝ Æ Â
Network Mask	Â
Metric Type	Â
TOS	TOS ˘ ѝ 0 Â
Metric	Â
Forward Address	˘ IP Â ѝ 0.0.0.0 Â
External Route Tag	˘ 32 Â OSPF a ˘ è ʃ OSPF Â

ЛЬЮ ѝ **show ip ospf database network** ʒ '

```
Ruijie# show ip ospf database network
OSPF Router with ID (1.1.1.1) (Process ID 1)
Network Link States (Area 0.0.0.0)

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

show ip ospf database network ʒ Ю Â

OSPF Router with ID	Л ЬЮ б OSPF Л Â
Network Link States	Л ЬЮ ѝ Â
LS age	Â
Options	Â
LS Type	Â

Link State ID	Â
Advertising Router	Â
LS Seq Number	Л Â
Checksum	Â
Length	˘ Лυ ы Æ Â
Network Mask	Â
Attached Router	Э Â

ЛЬЮ ы **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 ЮÂ

OSPF Router with ID	ЛЬЮ б OSPF Л Â
Router Link States	ЛЬЮ ы 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	˘ ЛU ѝ Æ Â
Network Mask	Â
TOS	TOS ˘ ѝ 0 Â
Metric	Â

ЛUЮ ѝ **show ip ospf databa]unssa exutena**

Options	Â
LS Type	Â
Link State ID	Â
Advertising Router	Â
LS Seq Number	ʃ Â
Checksum	Â
Length	˘ Л ѝ Æ Â
Network Mask	Â
Metric Type	Â
TOS	TOS ˘ ѝ 0 Â
Metric	Â
NSSA:Forward Address	˘ IP Â ѝ 0.0.0.0˝ Â
External Route Tag	˘ 32 Â OSPF a ˘ è ʈ OSPF Â

ЛЬЮ ѝ **show ip ospf database external** ʒ '

```
Ruijie# show ip ospf database external
OSPF Router with ID (1.1.1.1) (Process ID 1)
AS External Link States
LS age: 1290
Options: 0x2 (*|-|-|-|-|-|E|-)
LS Type: AS-external-LSA
Link State ID: 20.0.0.0 (External Network Number)
Advertising Router: 1.1.1.1 ExterMask: / 0.xternal-LSA than any l1.
```

OSPF Router with ID	ЛЬЮ б OSPF л Â
Type-7 AS External 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	˘ Лυ й Æ Â
Network Mask	Â
Metric Type	Â
TOS	TOS ˘ й 0 Â
Metric	Â
Forward Address	˘ IP Â й 0.0.0.0 Â
External Route Tag	˘ 32 Â OSPF a ˘ è ł OSPF Â

ЛЬЮ й **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
ЮÂ

OSPF Process	ЛЬЮ Л
Router Link	ш ˘ OSPF LSA Â
Network Link	ш ˘ OSPF LSA Â
Summary Link	ш ˘ OSPF LSA Â
ASBR-Summary Link	ш ˘ OSPFASBR LSA Â
AS External Link	ш ˘ OSPF LSA
NSSA-external Link	,OSPF NSSA LSA

ð ⊀ Ô

ð Ô

31.2.4 show ip ospf interface

б OSPF ˘ ȝ **show ip ospf interface** Â

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

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interface-type	ˆ ⊀ ~ Â
interface-number	ˆ ⊀ ~ Л Â

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ȝ˘ ⊀Л OSPF˝ Л OSPF Â

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ЛЬЮ ѝ **show ip ospf interface FastEthernet** *1/0* ȝ '

```
Ruijie# show ip ospf interface fa 1/0

FastEthernet 1/0 is up, line protocol is up
```

```
Internet Address 192.88.88.27/24, Ifindex 4, Area
0.0.0.0, MTU 1500
Matching network config: 192.88.88.0/24
Process ID 1, Router ID 1.1.1.1, Network Type
```

FastEthernet 0/0 State	˘ UP ˘ Down Â
Internet Address	IP Â
Area	OSPF ш Â
MTU	MTU
Matching network config	OSPF network area
Process ID	/I
Router ID	OSPF Â
Network Type	OSPF Â
Cost	OSPF Â
Transmit Delay is	OSPF Â
State	DR/BDR Â
Priority	˝I
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 /I
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

ð ¸ Ô *neigbhbor-dh()TJTT3 1 Tf12.7143 2 TD0 Tc<02c409c345dd02c51c122f0e1 04 re.0022 4d8*

ð Ô

31.2.5 show ip ospf neighbor

OSPF ˘ ¾ **show ip ospf neighbor** Â

show ip ospf [*process-id*] **neighbor** [[**detail**] | [[*interface-type interface-number*] [*neighbor-id*]]]

ð Ô

detail	^ ¿ ~ Â
interface-type interface-number	^ ¿ ~ G

```
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 ३ ЮЎ

Neighbor ID	Â
Pri	″I ˆ DR ˜
State	
Dead Time	Dead
Address	
Interface	
interface address	
In the area	ˉ ѡ
via interface	Â
Neighbor priority	OSPF ″I Â

BDR	BDR (Hello BDR)
	Hello E ˘ 0
Options	٦ ٭

Â

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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 ʒ Ю'

codes	Л
100.0.0.0/24	Â
[1]	cost
via	Ю б

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ð Ô

ð Ô

31.2.7 show ip ospf summary-address

OSPF ʃ ˘ ʒ

show ip ospf summary-address Â

show ip ospf summary-address

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ʒ NSSA ABR Э ˘ ʒ
Â

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ЛЬЮ ѝ **show ip ospf summary-address** ʒ '

```
Ruijie# show ip ospf summary-address
Summary Address Summary Mask    Advertise     Status
```

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˘ ʒ ˘ Л υ è

Â **show ip ospf neighbor** ʒ a Â

ð Ô

ЛЮ й **show ip ospf virtual-links** ʒ '

```
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
```

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32

32.1

32.1.1 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 a

```
router rip
network 200.168.23.0
distribute-list 10 in fastethernet 0/0
no auto-summary
!
access-list 10 permit 172.16.0.0 0.0.255.255
```

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˘ 8 ’ è
˘ ˚ ˘ è
a 8 Â

OSPF 8 ˘ a ˘ ɜ
OSPF Â

ð Ô

ЛЬЮ ˘ RIP 192.168.12.0/24 Â

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

ð ʒ Ô

ʒ	
access-list	Ⱨ
prefix-list	Ⱨ
redistribute	˚

32.1.3 ip community-list

ʒ Ⱨ ˘ 8 Â **no** ʒ è Â

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

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

ð Ô

community-list-name	ɻ ɻ a 32 Â
standard	˘ ʌ ѝ 1..99
expanded	˘ ʌ ѝ 100 ЛЬЭ
permit	
deny	

community-number	/ſ Â ỳ AA:NN(/ſ /2)˘ ≠ ⅃ Ɲ ƝЮ ⊮ ' internet˘ Internet ˘ Â no-export˘ a EBGP peers Â no-advertise˘ a BGP peers Â local-as˘ a AS ˘ ˘ a è Â ' 1..255 Â

no ip default-network *network*

ð Ô

network	Л Â

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ы 0.0.0.0/0 Â

ð ϡ Ô

Â

ð Ô

ы **default-network**
ЛЪЮ a
Ы Â

Л“*” Л Â
connected Ю Â

ð Ô

ЛЪЮ 192.168.100.0 ы
Л Ъ ╠ Â

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

ЛЪЮ 200.200.200.0 ы
200.200.200.0 ы Â

```
ip default-network 200.200.200.0
```

ð ϡ Ô

ϡ	
show ip route	IP Â

ð Л Ô

ϡ γ Э a Â

32.1.5 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** *de70.0022 Tc( )Tj/TT5 1 Tf0.Tc0-5.2(64j/ Tf0.2 4 TfTw( )Tj/TT14 1 Tf1.44 0 TD-0*

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

ЛЪЮ ѝ ↑ ˘ OSPF ↑ RIP
↑ IP ˘ IP
ЊЖ(IP 201.1.1.0/24 ↑
)˘ 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
```

32.1.6 ip prefix-list description

ѝ ╕ ˘ **ip prefix-list description** ҂ Â
҂ **no** Â

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

ð Ô

prefix-lis-name	⅃
descripton-text	

ð Ô

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ð ҂ Ô

ð Ô

ð Ô

ЛЪЮ ѝ ↑ ˘ OSPF ↑ RIP
↑ IP ˘ IP
ЊЖ(IP ѝ 201.1.1.0/24 ↑)˘
Ю '

```
Ruijie# configure terminal
```

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

32.1.7 ip prefix-list sequence-number

ѝ ╗ ˘ **ip prefix-list description** ϡ Â
ϡ **no** ↓ ╗ Â

ip prefix-list sequence-number

ð Ô

ð Ô

╗

ð ϡ Ô

ð Ô

ð Ô

ЛЬЮ ѝ ↑ ˘ OSPF ↑ RIP
↑ IP ˘ IP
ЊЖ(IP ѝ 201.1.1.0/24 ↑)ў
Ю '

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

32.1.8 ip route

˘ ϡ ip route Â ϡ no
Â

ip route [**vrf** *vrf_name*] *network net-mask* {*ip-address* | *interface* [*ip-address*]} [*distance*] [**tag** *tag*] [*permanent*] [**weight** *number*] [*disable* | *enable*]

ð Ô

vrf_name	VRF ↓
network	

net-mask	
ip-address	Ю
interface	ˆ ˩ ˜ Ю
distance	ˆ ˩ ˜
tag	ˆ ˩ ˜ Tag
permanent	ˆ ˩ ˜
number	ˆ ˩ ˜
disable/enable	ˆ ˩ ˜

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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
Â weight WCMP ╗ ˘
˩ ˘ ˙
˘ weight ˙ ˘ ˙
Â WCMP ⁸ ѝ 32˝
a ˩˘ Л∪ ѐ WCMP ⁸ б /ı ’
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
˘

ЛЪЮ ˘ ╗ 172.16.100.0/24 ˘
Ю ѝ 192.168.12.1˘ ѝ 115Â

```
ip route 172.16.100.0 255.255.255.0 192.168.12.1 115
```

˘ ˘ ┘

ÿ è Â ˘ ÂЛЪЮ
˘ 172.16.100.0/24 ÿ fastethernet 0/0
Â

```
ip route 172.16.100.0 255.255.255.0 fastethernet 0/0
192.168.12.1Â
```

ð ֽÔ

ֽ	
show ip route	IP Â

32.1.10 ip static route-limit

Э ˘ ֽ **ip static route-limit** Â
ֽ no ↲Л Â

ip static route-limit *number*

ip static route-limit *number*

ð Ô

number	Э ˘ 1-10000

ð Ô

й 1000 Â

ð ֽ Ô

Â

ð Ô

Э й ⁸ ˘ **ip static route-limit** Э Л Ю ˘ a Э Â **show running config** ↲Л Э Â

ð Ô

ЛЮ ˘ Э й 900 ˘ Л Â

```
ip static route-limit 900
```

ð Л Ô

ֽ γ Э a Â

32.1.11 ipv6 prefix-list

IPv6 ╗ ˘ **ipv6 prefix-list** ֽ Â ֽ **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∪ ∕ι Âὲ 1 2147483647 Â ϟ ∕ι˘ ὶή ϯ ∕ι Â ∕ι 5˝ ɻ ∕ι ∕ι 5
deny	ϗ
permit	ϗ

ЛЬЮ ѝ ǂ ˘ RIP ǂ OSPF
ǂ IP ˘ IPv6
ЊЖ(IP 2222::/64 ǂ
)˘ Ю '

```
Ruijie# configure terminal
Ruijie(config)# ipv6 prefix-list pre permit 2222::/64
Ruijie(config)# ipv6 router rip
Ruijie(config-router)# distribute-list prefix pre out
ospf
Ruijie(config-router)# end
```

32.1.12 ipv6 prefix-list description

ѝ IPv6 ╗ ˘ **ipv6 prefix-list description** ʒ Â ʒ **no** Â

ipv6 prefix-list *prefix-lis-name* **description** *descripton-text*

ð Ô

prefix-lis-name	IPv6 ɻ
descripton-text	IPv6

ð Ô

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ð Ô

ЛЬЮ ѝ ǂ ˘ OSPF ǂ RIP
ǂ IP ˘ IP
ЊЖ(IP ѝ 201.1.1.0/24 ǂ)˘

ὶ IPv6

Â

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match community ʒ ʌ ˩Л∪ Л ʌ ˘
ч a 6Â

exact-match ˘ a ך
Â

˘ ˩Л∪ 1 **match** ʒ 1
set ʒ Â **match** ʒ˘ ך ’ **set** ʒ˘
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 ʒ Ô

ʒ	
match as-path	ך AS_PATH
match metric	ך
match origin	ך
set as-path prepend	↑ AS_PATH Â
set metric	↑
set metric-type	↑

32.1.16 match interface

ך Ю й ˘ ʒ **match interface** Â ʒ

interface-type	
interface-number	ʌ

ð Ô

Â

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match interface ϧ ʌ ɻ Ո Â

ɻ Ո ÿ ʈ ʅ ╗ Â ɻ
Ո OSPF ʈ ʌ RIP ˘ ≠ ɻ Ո RIP
ʈ ʌ OSPF Â

ʈ ˘ ^ route maps˜ ˘ ч
ʈ ˚ ⁸ Â

˘ ɻ Ո 1 **match** ϧ 1
set ϧ Â **match** ϧ˘ ԁ˘ ך

ʌRIP´ þ ¨

match ip route-source	ꝛ
match metric	ꝛ
match route-type	ꝛ
match tag	ꝛ
set metric	ꝉ
set metric-type	ꝉ
set tag	ꝉ

ð ⊀ Ô

ð Ô

32.1.17 match ip address

ꝉ

ꝛ **match ip address** Â ꝛ **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	⊀
access-list-name	⊀
prefix-list *prefix-list-name*	ꝛ ⊀

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ð ꝛ Ô

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match ip address ꝛ ⊀ ⊀ ⊓ ⊀ ⊀ Â

ɻ Ɲ ÿ ɬ ɻ Ɲ Â ɻ
Ɲ OSPF ɬ ɻ RIP ˘ ≠ ɻ Ɲ RIP
ɬ ɻ OSPF Â ɬ ɻ
Ɲ IP Â

set tag	ϯ

ð ⊀ Ô

ð Ô

32.1.18 match ip next-hop

ϯ ЮO IP ˘
ϡ **match ip next-hop** Â ϡ **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	⊀
access-list-name	⊀
prefix-list *prefix-list-name*	ϧ ⊀

ð Ô

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match ip next-hop ϡ ⊀ ⊣ Л∪ ⊀ ⊀ Â

⊣ Л∪ ÿ ϯ ⊀ ╖ Â
⊣ Л∪ OSPF ϯ ⊀ ╖ Â ⊣ Л∪
OSPF ϯ ⊀ RIP ˘ ≠ ⊣ Л∪ RIP
ϯ ⊀ OSPF Â ϯ ⊣
Л∪ IP Â

ϯ ˘ ˆ route maps˜ ˘ Ч
ϯ ˚ ⁸ Â

˘ ⅄ Л∪ 1 **match** ֽ 1
set ֽ Â **match** ֽ˘ ֶ ’ **set** ֽ˘
a Â

ð Ô

ЛυЮ ˘ OSPF ƚ RIP Â RIP Ю
10 20ʊ OSPF è ƚ 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 ֽ Ô

ֽ	
access-list	Ⱨ
match ip address	ֶ
match interface	ֶ Ю
match ip route-source	ֶ
match metric	ֶ
match route-type	ֶ
match tag	ֶ
set metric	ƚ
set metric-type	ƚ
set tag	ƚ

ð ⅄ Ô

ð Ô

32.1.19 match ip route-source

ƚ IP ˘
ֽ **match ip route-source** Â ֽ **no**
Â

match ip route-source {*access-list-number* [*access-list-number...* |

access-list-name...] |*access-list-name* [*access-list-name...*]}

ɹЛυ ÿ ↑ ∧ ╖ Â ɹ
ЛU OSPF ↑ ∧ RIP ˘ ≠ ɹЛU RIP
↑ ∧ OSPF Â ↑ ɹ
ЛU IP Â

↑ ˘ ^ route maps˜ ˘ ч
↑ ˚ ⁸ Â

˘ ɹЛU 1 **match** ʒ 1
set ʒ Â **match** ʒ˘ ¬ ' **set** ʒ˘
a Â

ð Ô

↑ ˘ ɹЛU ↑ Э Âa
˘ è ˘ ʒ a ɹ Â
ɹ ↑ Э˘ a ɹ ˘ è
ʒ ≠ a ɹ Â

ЛUЮ ˘ OSPF ↑ RIP ˘ ↑
10 RIP ˘ OSPF ˘ ѝ
type-1˜ ѝ 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 ʒ Ô

ʒ	
ipv6 access-list	Ьѫ 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	↑

ð ✓ Ô

ð Ô

32.1.21 match ipv6 next-hop

ƚ ƗO IPv6

ˇ ৡ **match ipv6 address** Â ৡ **no**

Â

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

no match ipv6 next-hop

ð Ô

	ÄÄ

ЛЬЮ ˘ OSPF ↑ RIP ˘ ↑
10 RIP

access-list-name	ɻ
prefix-list *prefix-list-name*	ɔ IPv6 ɻ

ð Ô

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ð ʒ Ô

Â

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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 ˘ ^ route maps˜ ˘ ч
ɬ ˚ ⁸ 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 ˘ ʒ a ɻ Â
ɻ ɬ Э˘ a ɻ ˘ è
ʒ ≠ a ɻ Â

Л υ Ю ˘ OSPF ɬ RIP ˘ 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 5200::/64 any
route-map redrip permit 10
match ipv6 route-source v6acl
set metric 50
```

ð ʒ Ô

ʒ	
ipv6 access-list	Ьѫ IPv6

match interface	ϗ ЮО
match ipv6 address	ϗ IPv6 ЮО
match ipv6 route-source	ϗ IPv6
match metric	ϗ
match route-type	ϗ
match tag	ϗ
set metric	ϯ
set metric-type	ϯ
set tag	ϯ

ð ✓ Ô

ð Ô

32.1.23 match length

IP ˘ ϟ **match length** Â ϟ **no** ✓ Ո Ю Â

match length *min-length max-length*

no match length *min-length max-length*

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min-length	IP
max-length	IP

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˘ ᾱ ЮО Â

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ˇ ЊЖ 1 ϩ
Â ⁄ˇ
ˇ a ˇ
ЊЖ Â
ˇ ǂ a ⁄ ˇ ⁄ ⁄Ц
Â

ð Ô

ЛЦЮ ˇ serial 1/0 ˇ 500
ˇ 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 ϡ Ô

ϡ	
route-map	ЊЖ
match ip address	ϩ
set default interface	ˇ
set interface	
set ip default next-hop	Ю IP ˇ
set ip next-hop	Ю IP
set ip precedence	IP ″I

32.1.24 match metric

ϩ ˇ ϡ **match metric** Â ϡ **no** Â

match metric *metric*

no match metric

ð Ô

Metric	↓ ' 0-4294967295

ð Ô

Â

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ð Ô

↓ Л Ъ ÿ ↑ ↑ ╖ Â ↓ Л Ъ OSPF ↑ ↑ RIP ˘ ≠ ↓ Л Ъ RIP ↑ ↑ OSPF Â ↑ ↓ Л Ъ IP Â

↑ ˘ ^ route maps˜ ˘ ч ↑ ˚ ⁸ Â

˘ ↓ Л Ъ 1 **match** ʒ 1 **set** ʒ Â **match** ʒ˘ ¬ ' **set** ʒ˘ a Â

ð Ô

Л ЪЮ ˘ OSPF ↑ RIP Â й 10 RIP ˘ OSPF ↑ Â

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

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

ð ʒ Ô

ʒ	
access-list	Ћ
match ip address	¬
match interface	¬ Ю
match ip next-hop	¬ Ю
match ip route-source	¬
match route-type	¬
match tag	¬

set metric	
set metric-type	
set tag	

ð Ô

ð Ô

32.1.25 match origin

match origin **no**

match origin {**egp** | **igp** | **incomplete**}

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

ð Ô

egp	EGP
igp	IGP
Incomplete	a

ð Ô

ð Ô

ð Ô

a

ð Ô

```
route-map MY_MAP 10 permit
match origin egp
set community 109

route-map MAP20 20 permit
match origin incomplete
set community no-export
```

ǂ ʌ OSPF Â ǂ ɻ
ЛЪ IP Â

ǂ ˘ ^ route maps˜ ˘ ч
ǂ ˚ ⁸ Â

˘ ɻЛЪ 1 **match** ʒ 1
set ʒ Â **match** ʒ˘ ך ’ **set** ʒ˘
a Â

ð Ô

ЛЪЮ ˘ RIP ǂ OSPF ÂRIP ǂ 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	ǂ
set metric-type	ǂ
set tag	ǂ

ð ʌ Ô

ð Ô

32.1.27 match tag

ϗ ˘ ϟ **match tag** Â ϟ **no**
Â

match tag *tag* [*…tag*]

no match tag *tag* [*…tag*]

ð Ô

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

ð Ô

ð Ô

32.1.28 maximum-paths

ˇ ˇ **maximum-paths** Â

no Л Ц Â

maximum-paths *number*

no maximum-paths *number*

ð Ô

number	ˇ ˇ 1-32

ð Ô

и 32 б Ґ Л Â

ð Ô

Â

ð Ô

ˇ и 8 ˇ ˇ

maximum-paths ˇ Л Ю ˇ

Ю ¦ a ˇ Â **show running config** Л Ц ˇ Â

ð Ô

ЛЬЮ ˘ ˈ й 10 ˘ ⁄ Â

```
maximum-paths 10
no maximum-paths
```

ð ⁄ Ô

ʒ γ Э a Â

32.1.29 route-map

ѭ ˘ ˘ ʒ **route-map** Â
ʒ **no** ѭ Â

route-map *route-map-name* [**permit** | **deny**] [*sequence-number*]
no route-map *route-map-name* [**permit** | **deny**] [*sequence-number*]

ð Ô

route-map-name	ѭ ⁄ Â ˆ ʒ ⁄ Â ⁄ Л Ь ѭ ˘ /
permit	ˆ ⁄ ~ ѭ permit ˘ match ѭ ר Â set ʒ ˆ 8 ’ ˘ set ʒ 8 Â Â ѭ permit ˘ a match ѭ ר Â γ Â set ʒ
deny	ˆ ⁄ ~ ѭ deny ˘ match ѭ ר Â a ˘ a ˆ ˘ 3 Â ѭ deny ˘ a match ѭ ר Â Ю Â set ʒ Â
sequence-number	/ Â æ / ¨I ˘ / Â

ð Ô

Â

ð ʒ Ô

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ð Ô

RGIOS ˚ ў ч ' ˝ à ˦ ⁸' ˇ à
Â

˝ à ˦ ⁸

ɹ Л υ ÿ ˦ ʌ ╗ Â ɹ
Л υ OSPF ˦ ʌ RIP ˇ ≠ ɹ Л υ RIP
˦ ʌ OSPF Â ˦ ɹ
Л υ IP Â

˦ ˇ ^ route maps˜ ˇ ч
˦ ˚ ⁸ Â

ˇ ɹ Л υ 1 **match** ʒ 1
set ʒ Â **match** ʒˇ ¬ ' **set** ʒˇ
a Â

ˇ ʌ ЛЮ '

1) ˇ *sequence-numbeř*
ѝ 10ʼ

2) ˇ *sequence-numbeř* a
ˇ ,

ˇ ʌˇ Â

2 à

^ PBRʼ Policy-Based Routing˜ ⁸
⁸ Â IP ⁸ˇ
Â ɹ Л υ IP à à
Â ɹ Л υ Эˇ
IP ' ≠ ɹ Л υ ˇ
Â

Ⱶ ˇ match Ⱶ
ˇ set ʌ Ⱶ ɹ ╟ Â
match ʌ match ip address àmathc lengthʼ
set ʌ set ip tos à set ip precedence à set ip dscp à set ip [default]
nexthop à set ip next-hop verify-availability à set [default] interface Â

ð Ô

ЛЮ ˇ OSPF ˦ RIP ˇ ˦
ѝ 4 RIP ˇ OSPF ˇ ѝ type-1˜
ѝ 40˜ ѝ 40 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 metric 4
set metric 40
set metric-type type-1
set tag 40
```

ð ৡ Ô

ৡ	
Redistribute	⅄

ð ⅄ Ô

ð Ô

32.1.30 set aggregator as

ר 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

Â

ð ৡ Ô

Â

ي

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

ð ৡ Ô

ৡ	

ð ৡ Ô

ৡ	
match as-path	৲ AS_PATH
match community	৲
match metric	৲
match origin	৲
set community	৻ COMMUNITY
set metric	৻
set metric-type	৻

32.1.32 set comm-list delete

৲ match COMMUNITY_LIST community ˘ ৡ **set comm-list delete** Â ৡ **no** Â ৡ Â

set comm-list *community-list-number* | *community-list-name* **delete**

no comm-list *community-list-number* | *community-list-name* **delete**

ð Ô

community-list-number	৸
community-list-name	৸

ð Ô

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ৡ ৲ Â

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

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

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

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

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

ð ৡ Ô

match as-path ৭ AS_Pr6e[4.0057f055-8 123215fb>-ccc07610

ð Ô

Â

ð ৡ Ô

Â

ð Ô

ৗ Â

ð Ô

```
route-map SET_COMMUNITY 10 permit
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	ৎ AS_PATH
set origin	ৎ
set metric-type	ৎ

32.1.34 set dampening

ৗ match ˘

half-life	˧ a ˧ Â 1..45(ˀ)ˇ й 15ˀ
reuse	æ ˘ ⁸ Â 1..20000ˇ й 750 Â
suppress	˘ ⁸ Â 1..20000ˇ 2000 Â
max-suppress-time	⁸ Â 1..255(ˀ)ˇ й 4* half-life

ð Ô

Â

ð ʅ Ô

Â

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˥ Â

ð Ô

```
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 ʅ Ô

ʅ	
match as-path	˥ AS_PATH
match community	˥
match metric	˥
match origin	˥
set as-path prepend	ˀ AS_PATH
set metric	ˀ
set local-preference	ˀ ˝l

32.1.35 set default interface

ϗ match ϳ ˘

ϟ **set default interface** Â ϟ **no**

Â

set default interface *interface-type interface-number* [*…interface-type interface-number*]

no set default interface *interface-type interface-number* [*…interface-type interface-number*]

ð Ô

interface-type	
interface-number	

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set default interface ϟ ϻ ϽЛ Â

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˘ ᾱ Ю Â

˘ ˘ ϳ Â

˘ Ⱶ 1 ϗ

Â ϻ˘

ð ϡ Ô

ϡ	
route-map	Ⱶ
match ip address	ϩ
match length	ϩ
set interface	
set ip default next-hop	ⱵO IP ˘
set ip next-hop	ⱵO IP
set ip precedence	IP ˝I

ð ⊿ Ô

a ϡ

ϡ

32.1.36 set extcommunity

ϩ match ˘
ϡ **set extcommunity** Â ϡ **no** Â ϡ
Â

set extcommunity {**rt** *extend-community-value* | **soo** *extend-community-value*}

no set extcommunity {**rt** | **soo**}

ð Ô

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ð Ô

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ð Ô

```
access-list 2 permit 192.168.78.0 255.255.255.0
route-map MAP_NAME permit 10
match ip-address 2
set extcommunity rt 100:2
```

ð 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 metric-type	ৡ

32.1.37 set interface

ৗ match ˘ ৡ **set interface** Â ৡ **no** Â

set interface *interface-type interface-number* [*…interface-type interface-number*]

no set interface *interface-type interface-number* [*…interface-type interface-number*]

ð Ô

interface-type	

interface-number

Â

a ϡ

ϡ

32.1.38 set ip default next-hop

ϩ match Ю IP ˘
ϡ **set ip next-hop** Â ϡ **no** Â

set ip default next-hop *ip-address* [*weight*] [*…ip-address* [*weight*]]

no set ip default next-hop *ip-address* [*weight*] [*…ip-address* [*weight*]]

ð Ô

ip-address	Ю IP
weight	Ю

ð Ô

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ð ϡ Ô

Â

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set ϡ ч ' WCMP ˘ WCMP
Â Ю˘ weight
WCMP Â

set ip default next-hop ϡ л ┘Л IP ˘ a 32 Â

ip address л ╗ weight ˘ ┘Л a 4 nexthop Â

˘ next-hop л weight ˘ set ϡ
╟┼ и WCMP Â WCMP
Ю˘ weight

ʒ ѝ ¤ ╖ Â ˚ Э
ѝ ˘ ʒ Ю
(nexthop) Э Â

˘ ˘ з Â
˘ Ӂ 1 ┐
Â Л˘
˘ a ˘
Ӂ Â

┘Л Ъ set Â

ð Ô

ЛЪЮ ч a ┘ ǂ a ┘ Э Â

┘ 1 Э ÿ 1.1.1.1 ˘ ˚ a
˘ 6.6.6.6 ’ ÿ 2.2.2.2 ˘
˚ a ˘ 7.7.7.7 Â è
˚ a Â

```
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
```

ð ʒ Ô

ʒ	

set ip next-hop	ЮO IP ˘
set ip precedence	IP ˝l

32.1.39 set ip dscps

ר match DSCP ˘ ৡ **set ips dscp** Â ৡ **no** Â

set ip dscps *dscp_value*

no set ip dscp

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	DSCP

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ৡ	
route-maps	Ю
match ip address	ר

c0 T-JTT329 0.0171 TD0 Tc0 Tw0 97347214197Tj/T4bc207eb[0]TTT2 1b44>/TT59 0 8d9>

ð Ô

32.1.40 set ip next-hop

ϩ match Ю 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	Ю IP
weight	Ю

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 ЛЛ IP ˘ a 32 Â

IP

˘ a ˘

Ⱶ Â

ɻ Л set Â

ð Ô

ЛЬЮ ˘ serial 1/0 Э Â
10.0.0.0/8 ˘ 192.168.100.1’
ѝ 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 ʒ Ô

ʒ	

32.1.41 set ip next-hop verify-availability

Ю IP ˘ **set ip next-hop verify-availability** Â **no** Â

set ip next-hop verify-availability *ip-address* **track** *track-object-num*

no set ip next-hop *ip-address* [*weight*] [*…ip-address* [*weight*]]

ip-address	Ю IP
track-object-num	/I

Â

Â

Â

ЛЪЮ ˘ serial 1/0 Э Â
10.0.0.0/8 ˘ 192.168.100.1’
ѝ 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	Ⱶ
match ip address	ϩ
set default interface	˘
set default interface	˘
set interface	
set ip default next-hop	ⱷO IP ˘
set ip precedence	IP ″I

ð ⊿ Ô

ð Ô

32.1.42 set ip precedence

ϩ match IP ″I ,
ϡ **set ip precedence**

˘ ⊿ ⎍ **set ip precedence** ڑ˘

⊿ ˘ ɜ ך IP

˝I Â

ð ϟ Ô

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ð Ô

IP TOS IP
a ⅃ Ь Â

ϗ IP Э TOS Â

ð Ô

ЛЬ Ю ˘ ÿ fastEthernet 0/0 ѝ
192.168.217.68 tos ѝ 4 Â

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

ð ϟ Ô

ϟ	
match interface	ϗ Ю
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-type	ϯ
set tag	ϯ
set ip precedence	IP ″I

32.1.44 set level

ϗ match Ш ˘
ϟ **set level** Â ϟ **no** Â

set level {**level 1**| **level 2** | **level 1-2** | **stub-area** | **backbone**}

no set level

ð Ô

Â

ð ϡ Ô

Â

ð Ô

ð Ô

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 ϡ Ô

ϡ	
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

32.1.45 set local-preference

ϩ match LOCAL_PREFERENCE ˘
ϡ **set local-preference** Â ϡ **no** Â

set local-preference *number*

no set local-preference

ð Ô

number	˝I Â ' 0..4294967295

ð Ô

Â

ð ʒ Ô

Â

ð Ô

local-preference ˘ a local-preference
Â

ʒ ˥ ˝I Â

ð Ô

```
route-map SET_PREF permit 10
match as-path 1
set local-preference 6800

route-map SET_PREF permit 20
match as-path 2
set local-preference 50
```

ð ʒ Ô

ʒ	
match as-path	˥ AS_PATH
match metric	˥
match origin	˥
set as-path prepend	˚ AS_PATH
set metric	˚
set metric-type	˚

32.1.46 set metric

˥ match ˘ ʒ **set metric** Â ʒ **no** Â

set metric [+ *metric-value* | **-** *metric-value* | *metric-value*]

no set metric

ð Ô

+	╗ˆ metric Э ╗˜
-	ˆ metric Э ˜
metric-value	┼

ð Ô

a ┘ ┼ a Â

ð Ô

Â

ð Ô

˘ ˘

Â è set metric à Л ¦ + Ľ ¦ - Ľ metric
ЭЮ Â RIP ┼ è ˘ metric
Л й 1-16 Â

┘ Л ÿ ┼ Л ╗ Â ┘
Л OSPF ┼ Л RIP ˘ ≠ ┘ Л RIP
┼ Л OSPF Â ┼ ┘

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-type	ϯ
set tag	ϯ

ð ⊿ Ô

ð Ô

32.1.47 set metric-type

ϗ match ˘ ϗ

set metric-type Â ϗ **no** Â

set metric-type *type*

no set metric-type

ð Ô

type	ϯ

ð Ô

OSPF ϯ ѝ type-2 Â

ð ϗ Ô

Â

ð Ô

⊣ Л ÿ ϯ ⊿ ℸ Â ⊣ Л RIP ˘ ≠ ⊣ Л RIP ϯ ⊿ OSPF Â ϯ ⊣ Л IP Â

ϯ ˘ ^ route maps˜ ˘ ч ϯ ˚ ⁸ Â

ˇ ⅄Л 1 **match** ʒ 1
set ʒ Â **match** ʒˇ ¬ ’ **set** ʒˇ
a Â

ð Ô

ЛЬЮ ˇ OSPF ƚ RIP ˇ ƚ
ѝ type-1 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 metric-type type-1
```

ð ʒ Ô

ʒ	
match interface	¬ Ю
match ip address	¬
match ip next-hop	¬ Ю
match ip route-source	¬
match metric	¬
match route-type	¬
match tag	¬
set metric	ƚ
set tag	ƚ

ð ⅄ Ô

ð Ô

32.1.48 set next-hop

¬ match Ю IP ˇ
ʒ **set next-hop** Â ʒ **no** Â ʒ
Â

set next-hop *ip-address*

no set next-hop *ip-address*

ð Ô

i*p-address*	Ю IP

ð Ô

set tag	↑

32.1.49 set origin

ה match
ৡ **set origin** Â ৡ **no** Â

set origin {**egp** | **igp** | **incomplete**}

no set origin

ð Ô

egp	EGP
igp	IGP
Incomplete	a

ð Ô

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ð ৡ Ô

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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 ৡ Ô

ৡ	
match as-path	ה AS_PATH
match metric	ה
match origin	ה

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

32.1.50 set originator-id

match

set originator-id **no**

set originator-id *ip-addr*

no originator-id [*ip-addr*]

ip-addr	

```
route-map SET_ORIGIN 10 permit
match as-path 1
set originator-id 5.5.5.5
route-map SET_ORIGIN 20 permit
match as-path 2
set originator-id 5.5.5.6
```

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

set metric	
set local-preference	

32.1.51 set tag

match **set tag**

no

set tag *tag*

no set tag

tag **m**

match ip route-source	┐
match metric	┐
match route-type	┐
match tag	┐
set metric	┼
set metric-type	┼

ð ⊿ Ô

ð Ô

32.1.52 set weight

┐ match BGP ˘ ʒ
set weight Â ʒ **no** Â

set weight *number*

no set weight

ð Ô

number	Â ' 0…65535

ð Ô

Â

ð ʒ Ô

Â

ð Ô

ʒ BGP Â

Ю˘ ÿ ˘ neighbor weight
' 32768 Â

⊣ Л∪ ʒ BGP ┼ Â

ð Ô

ЛЮ ˘ 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 ϛ Ô

ϛ	
match as-path	ϗ AS_PATH
match community	ϗ
match metric	ϗ
match origin	ϗ
set community	ϳ COMMUNITY
set metric	ϳ
set metric-type	ϳ

ð ϰ Ô

ð Ô

32.1.53 ip ref ecmp load-balance source

˚ ECMP/WCMP ˘ ϙ ≠
Â Ю ˘ ˚
è Ю Â

ϙ Л∪ ϳ' HASH(KEY(SIP,[DIP] [TCP/UDP Port] [UDF]))

ϳ' Hash ˘
Ю Â è ч ' '
HASH ˘ ˚ 2 ' CRC32_Upper
CRC32_Lower Â ϰ ' KEY˘ ϙ Л∪
KEY˘ Ю IP (SIP) Â ϙ ≠ ╗
TCP/UDP à IP(DIP) à Ѭ
б KEY Â

ip ref ecmp load-balance
{[**crc32_lower** | **crc32_upper**] [**dip**] [**port**]
[**udf number**]}

no ip ref ecmp load-balance
{[**crc32_lower** | **crc32 upper**] [**dip**] [**port**]
[**udf number**]}

ð ϛ Ô

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ð Ô

DIP˘ Port˘ UDF б Key Â з
CRC32_Lower CRC32_Upper è ù Hash
no ʒ Э **no** ʒ ù
Key ʃ Â
ù SIP + DIP + Port Â **no ip ref ecmp route dip port**
ʒ Л˘ б Key SIP Â **no** ʒ Л
a ˘ ʒ a Â

ð Ô

˚ hash
Ruijie(config)# **ip ref ecmp load-balance crc32_upper**

˚ ù ip( ), ip,udp/tc Ôp,Âdp/tc

Â

ð Ô

```
Ruijie# show route-map
route-map AAA, permit, sequence 10
Match clauses:
ip address 2
Set clauses:
metric 10
```

```
Community-list standard local
permit local-AS
Community-list standard Red-Giant
permit 0:10
deny 0:20
```

ð ৡ Ô

ð ৶ Ô

32.2.3 show ip prefix-list

ˇ **show ip prefix-list**

ৡ Â

show ip prefix-list [*prefix-name*]

ð Ô

prefix-name	৸

ð Ô

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ð Ô

৸ ˇ ˇ

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ð Ô

```
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
```

32.2.4 show ip route

IP ˇ **show ip route** ৡ Â

show ip route [[**vrf** *vrf_name*] [*network* [*mask*] | **count** | **protocol** [*process-id*] | **weight**]]

ð Ô

vrf *vrf_name*	^ ⅃ ~ VRF
network	^ ⅃ ~
mask	^ ⅃ ~
count	^ ⅃ ~
protocol	^ ⅃ ~ ' **connected**, **static**' ˘ Ю ' **bgp**, **isis**, **ospf**, **rip**
process-id	^ ⅃ ~ /I
weight	^ ⅃ ~

ð Ô

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ð ϧ Ô

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ð Ô

ϧ ⅃Л˘ Â

ð Ô

ЛЬЮ ѝ **show ip route** ϧ '

```
Ruijie# show ip route
Codes:  C - connected, S - static, R - RIP, B - BGP
O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external
type 2
E1 - OSPF external type 1, E2 - OSPF external type 2
i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2
- IS-IS level-2
ia - IS-IS inter area, * - candidate default

Gateway of last resort is no set
S    20.0.0.0/8 is directly connected, VLAN 1
S    22.0.0.0/8 [1/0] via 20.0.0.1
O E2 30.0.0.0/8 [110/20] via 192.1.1.1, 00:00:06, VLAN
1
```

```
R    40.0.0.0/8 [120/20] via 192.1.1.2, 00:00:23, VLAN
1
B    50.0.0.0/8 [120/0] via 192.1.1.3, 00:00:41
C    192.1.1.0/24 is directly connected, VLAN 1
C    192.1.1.254/32 is local host.
```

show ip route ʒ ЮЎ

Â ┘ ┘

и'

C

O

Routing Descriptor Blocks	Ю IP à à à à à

ЛЬЮ и **show ip route count** ҳ '

```
Ruijie# show ip route count
--------- route info ----------
the num of active route: 5
```

ЛЬЮ и **show ip route weight** ҳ '

```
Ruijie# show ip route weight
------------[distance/metric/weight]-----------
S    23.0.0.0/8 [1/0/2] via 192.1.1.20
S    172.0.0.0/16 [1/0/4] via 192.0.0.1
```

32.2.5 show ipv6 prefix-list

IPv6 ˘ **show ipv6 prefix-list** ҳ Â

show ipv6 prefix-list [*prefix-name*]

ð Ô

prefix-name	IPv6 ɻ

ð Ô

IPv6 Â

ð ҳ Ô

à à à à

ð Ô

ɻ ˘ ˘

Â

ð Ô

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

32.2.6 show ip ref

ʒ REF ˘ à
à à Â

ð ʒ Ô

ð Ô

┘Л ʒ REF б
Â

ð Ô

```
Ruijie# show ip ref
```

33

33.1

33.1.1 ip policy route-map

ip policy route-map Â

no Â

ip policy route-map *route-map*

no ip policy route-map

ð Ô

route-map	Â

ð Ô

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ð Ô

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ð Ô

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ACL ACL a

ACL Â Â

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ð Ô

ЛЮ ˘ Лυ 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 Ô

load-balance|redundance	

ð Ô

Â

ð ϛ Ô

Â

ð Ô

set ip next-hop ˘ ˩ Л Ю ˘
˘ ˩ Л Ю ’
˘ Ю ˘ WCMP ˩ Л
4 Ю ˘ ECMP ˩ Л 32 Ю Â Ю
˘ ARP Ю Â

ð Ô

ЛЮ ˘ nexthop, Ю
˅ EF0 Э
nexthop ˘ 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
set ip next-hop 196.168.4.7
set ip next-hop 196.168.4.8
exit
route-map lab1 permit 20
match ip address 2
set ip next-hop 196.168.5.6
set ip next-hop 196.168.5.7
set ip next-hop 196.168.5.8
exit
interface FastEthernet 0/0
ip policy route-map lab1
exit
ip policy redundance
```

34 IPv6

34.1

IPv6 ЛЬЮ ʒ'

- **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**
- **show ipv6 route**
- **show ipv6 neighbors**
- **show ipv6 interface**
- **clear ipv6 neighbors**
- **tunnel destination**
- **tunnel mode ipv6ip**

- **tunnel source**
- **tunnel ttl**

34.1.1 ping ipv6

¾ IPV6 Â

ping ipv6 [*ipv6-address*]

ð Ô

ipv6-address '

ð ¾ Ô

ð Ô

¾ a ˘ ˩ ΠU é
Â ping /ı ЊЖ Ю'

/ı	ЊЖ
!	
.	
U	ў
R	
F	
A	

D Down
IPV6 ╖ (

ð Ô

~

Э IPv6 ѫ IPv6 ╖ ╟ ˘
no ipv6 enable ≠ a IPV6 ╖ Â

ð Ô

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

ð ϡ Ô

ϡ

interface-id ' ˆ Routed Port,L3 AP
SVI ˜ Â

hardware-address ' ˇ Л XXXX.XXXX.XXXX
48 Æ MAC ˇ 'X' Ώ 8

ð Ô

Â

ð ३ Ô

ð Ô

३ ARP ३ˇ

ð ʒ Ô

ð Ô

ѝ 0 ' ↓ Ь ˘ Л∪
Ю IPv6 ˘ Ÿ
0 IPv6 Â

ð Ô

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

34.1.7 ipv6 route

ʒ IPV6 ˘ ʒ 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 /ˆ˘ RFC2373
prefix-length IPV6 ˘ ╗ Э'/'

ipv6-address ' Ю ˘ RFC2373
ÂЮ ↓Л∪ Ю ↓ Â
Ю ˘ ѫ Â

interface-id ' ˘
Ю ˘ ѫ ѝ
Э˘ Â
Ю ˘ ѫ Â

ð ʒ Ô

ð Ô

' Ю ѫ
, з Ю ≠
Â Ю a ˘
Ю ˘ ѫЮ ┐
Â

ð Ô

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

ð ʒ Ô

ʒ	
show ipv6 route	IPV6

34.1.8 ipv6 ns-linklocal-src

ʒ˘ ỳ Â
ľ **no ipv6 ns-linklocal-src** ľ˘ ỳ
Â

ipv6 ns-linklocal-src

no ipv6 ns-linklocal-src

ð Ô

˘ Л ỳ Â

ð ʒ Ô

ð Ô

ð Ô

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

34.1.9 ipv6 nd ns-interval

ʒ Э (NS) ˘ ʒ no
Â

ipv6 nd ns-interval *milliseconds*

no ipv6 nd ns-interval

ð Ô

milliseconds ' ˘ Л ỳ Æ˘ '
1000-429467295

ð Ô

Ѽ (RA) ỳ 0( )˘
ỳ ỳ 1000ms(1)

ð ʒ Ô

ð Ô

Ὼ (RA) ˘ ⅃ ≠
Â a Â

ð Ô

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

ð ३ Ô

३	
show ipv6 interface	

34.1.10 ipv6 nd reachable-time

३ Э NDP ╟ ⅃ ⅄˘
ὶ ⅃ ˘ ३ no

ipv6 nd reachable-time *milliseconds*

no ipv6 nd reachable-time

ð Ô

milliseconds ' ὶ ⅃ ˘ Л∪ ὶ Æ˘ '
0-3600000

ð Ô

Ὼ (RA) ὶ 0( )˘
ὶ ὶ ⅃ ὶ 30000ms(30)

ð ३ Ô

ð Ô

a ⅃ ˘ ⅃
Л∪ ˘ à
Â a Â

Ὼ (RA) ˘ ⅃ ≠
Â ὶ 0 ˘ Â

RFC4861 ˘ ⅃ Э
╟˘ 0.5 1.5 Â

ð Ô

```
Ruijie(conifg-if)# ipv6 nd reachable-time 1000000
```

ð ३ Ô

३	
show ipv6 interface	

34.1.11 ipv6 nd prefix

३ Ω (RA) ˘ ३
no Â

ipv6 nd prefix *ipv6-prefix*/*prefix-length* | **default** [[

ð ٪ Ô

ð Ô

٪ ٫ Л٭ ˘ Ѽ
˘ Ю Ѽ (RA)Ѽ Э ipv6
address ٪ ˘ ╗ è ٫ 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 ٫ a
˘ 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 ٫ ╠)

```
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

34.1.12 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 ˘ 0-9000s.

ð Ô

1800

ð ʒ Ô

ð Ô

“ ” Ὼ (RA) ˘
Э ў ˩ Л υ ѝ Â ѝ
0 a Ἀ Â 0
Ὼ (RA) (ra-interval) Â

ð Ô

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

ð ʒ Ô

ʒ	
show ipv6 interface	ra-info
ipv6 nd ra-interval	Ὼ
ipv6 nd ra-hoplimit	Ὼ
ipv6 nd ra-mtu	Ὼ MTU

34.1.13 ipv6 nd ra-interval

ʒ Э Ὼ (RA) ˘ ʒ
no Â

ipv6 nd ra-interval {*seconds* | **min-max** *min_value max_value*}

no ipv6 nd ra-interval

ð Ô

seconds Ὼ (RA)Ὼ ,3-1800s Â

min-max′

min_value′

max_value′

ð Ô

200 ˘ 200 ЭЮ ╟ 20 Â

ð ֯ Ô

ð Ô

Ĭ ˘ ѫ a
Â ʌ ˘ ѝ Э è ɻ Ѽ
ˊ ˘ Л Э ╟ ĭ γ Â

min-max˘ ѫ
Â

ð Ô

```
Ruijie(config)# interface vlan 1
Ruijie(config-if)# ipv6 nd ra-interval 110
Ruijie(config-if)# ipv6 nd ra-interval min-max 110 120
```

ð ֯ Ô

֯	
show ipv6 interface	**ra-info**
ipv6 nd ra-lifetime	
ipv6 nd ra-hoplimit	Ѽ
ipv6 nd ra-mtu	Ѽ MTU

34.1.14 ipv6 nd ra-hoplimit

֯ Э Ѽ (RA) ˘
֯ no Â

ipv6 nd ra-hoplimit *value*

no ipv6 nd ra-hoplimit

ð Ô

value ' Ѽ (RA) Â

ð Ô

64 Â

ð ֯ Ô

ð Ô

Ù Â

ð Ô

```
Ruijie(config)# interface vlan 1
Ruijie(config-if)# ipv6 nd ra-hoplimit 110
```

ð ¾ Ô

¾	
show ipv6 interface	**ra-info**

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

34.1.16 ipv6 nd managed-config-flag

٪ Ὼ “**managed address configuration**” Æˇ ٪ no Æ Â

ipv6 nd managed-config-flag

no ipv6 managed-config-flag

ð Ô

Ὼ Æ Â

ð ٪ Ô

ð Ô

Æ ᾱ Ὼ ў ╟
↓ Â Æ ˘ ╟ ˘
a Â

ð Ô

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

ð ٪ Ô

٪	
show ipv6 interface	ra-info
ipv6 nd other-config-flag	╟ ↓ Æ

34.1.17 ipv6 nd dad attempts

٪ Э й IPV6 ă (NS) Â ٪ no Â

ipv6 nd dad attempts *value*

no ipv6 nd dad attempts

ð Ô

value ' (NS) Â ѝ 0 ѝ
Э Ipv6 ╟ ă Â ' 0-600

ð Ô

1

ð ٪ Ô

ð Ô

Э IPV6 ˘
ѝ ╟ ă ˘ ”tentative”( ) Â
ă ˘ ă ˘ ѫ ۸Ա ˘
ă ˘ з EUI-64
˘ ѫ Э ˘ ѫ
╟ (Э IPV6)˘
˘ Ѫ down/up ╟ ă
Â Ю ÿ down ۸ ѝ up ѝ Э
╟ ă Â

ð Ô

```
Ruijie(conifgf)# interface vlan 1
Ruijie(conifg-if)# ipv6 nd dad attempts 3
```

ð ٪ Ô

٪	
show ipv6 interface	

34.1.18 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 Ὼ ⅃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

34.1.19 ipv6 redirects

Э IPV6 ÿ ⅃Л
ֽ ⁸ Э ICMPv6 ˘ ֽ
no Э a ICMPv6 Â

ð ३ Ô

ð Ô

३ ⅃ Л RDP ╟ a

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

ð ʒ Ô

ʒ	
tunnel source	
tunnel destination	
tunnel ttl	TTL

34.1.22 tunnel destination

ʒ ŕ è , ʒ no ʒ
Â

tunnel destination *ipv4-address*

no tunnel destination

ð Ô

ipv4-address ' , ʌ IPv4

ð Ô

Â

ð ʒ Ô

ð Ô

a ʌ Э è à ɹ
Â

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╟ (6to4 isatap) 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 ʒ Ô

ʒ	
tunnel source	
tunnel mode	
tunnel ttl	TTL

34.1.23 tunnel source

ʒ ŭ è , ʒ no ʒ
Â

tunnel source {*ipv4-address* | *interface-type interface-number*}

no tunnel source

ð Ô

ipv4-address ' IPv4 ˘ IPv4 ŭ
Â

interface-type interface-number ' ˘
ў IPv4 ŭ IPv4 Â

ð Ô

Â

ð ʒ Ô

ð Ô

ɻ Ʌ IPv4 ≠ ɻ Ʌ Э
IPv4 , ╠ (6to4 isatap) è
Â

~

a ɻ Э è à ɻ
Â

╠ ˘ ╠ a ɻ Â

ð Ô

IPv6 '

```
Ruijie(config)# interface tunnel 1
Ruijie(config-if)# tunnel mode ipv6ip
```

34.2.1 show ipv6 route

IPV6 Â

show ipv6 route [**static**] [**local**] [**connected**]

ð Ô

static '

local '

connected '

ð ¾ Ô

ð Ô

¾ ¬ Л 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
L    fe80::200:ff:fe00:1/128
     via ::, loopback 0
C    fe80::/64
     via ::, vlan 2
```

ð ¾ Ô

¾	

ipv6 route	

34.2.2 show ipv6 neighbors

IPV6 Â

show ipv6 neighbors [**verbose**] [*interface-id*] [*ipv6-address*]

ð Ô

verbose '

interface-id ' Э

ipv6-addres '

ð ३ Ô

ra-info ' Э RA

ð ʒ Ô

ð Ô

ʒ ⅃ Л∪ IPV6 Э à ND Л∪
Â

ð Ô

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

Э ⅃ Л∪ INET6: 2001::1 , subnet is 2001::/64 [TENTATIVE] ˘ ' INET6 Л [] Æ ЊЖ Ю

Æ	ЊЖ
ANYCAST	й
TENTATIVE	й ă (DAD),
DUPLICATED	
DEPRECATED	˘ ⅃ й a
NODAD	a ă

!M

!M | M

35 OSPFv3

35.1

35.1.1 area default-cost

stub ш NSSA ш ABR Э ٪˘ Ⱨ stub ш
NSSA ш ٪ˢ Â ٪ **no** Â

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

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

ð Ô

area-id	stub ш NSSA ш ш Л Â è ˩ Л∪ ѝ IPv4 Â
cost	stub ш NSSA ш ٪ˢ Â 1-16777214 Â

ð Ô

default-cost ѝ 1 Â

1ðS!ðÔ٪ NSSA **%** ف ﺳﺒ ð Ô

֐ stub ש Stub ש ˘ ֐

no ה ש Stub

٣ ˘ ٣

no ┘Л Â

area *area-id* **virtual-link** *router-id*

- ш a stub ш NSSA ш Â
- ч Э ˘ **hello-interval** à **dead-interval** **instance** ˘ Â
- **no area** *area-id* ш (ш)Â

ð Ô

Ю ˘ '

```
ipv6 router ospf 1
area 1 virtual-link 192.1.1.1
```

ð ʒ Ô

ʒ	
show ipv6 ospf	OSPFv3 Â
show ipv6 ospf neighbor	OSPFv3 Â
show ipv6 ospf virtual-links	OSPFv3 Â

35.1.5 auto-cost

OSPF ˘ ʒ ╟ ˘ ʒ **no** Â

auto-cost [

ɹ Л Ю ʒ **ipv6 ospf cost** ѝ
ʒ˙ ˘ è ˮI Â

ð Ô

Ю ˘ ѝ 10M˙

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

ð ʒ Ô

ʒ	
ipv6 ospf cost	ʒ˙ Â
show ipv6 ospf	OSPFv3 Â

35.1.6 clear ipv6 ospf process

ʒ OSPF Â

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

ð Ô

process-id	ospf /ˇ <1-65535>

ð ņR Ô

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 1Â
metric-type *type*	ˆ ˩ ˜ ÂOSPF ч ' 1˘ a ˩ Э a ' 2˘ Â 1 2 ˩ Â и 2Â
route-map *map-name*	route-map ˧ , route-map

ð Ô

a Â

ð ʒ Ô

OSPFv3 Â

ð Ô

redistribute **default-information** ʒ ˘ OSPF ╟ ˩ и ASBR˘ ˜ Â

redistribute ˘ OSPF ÂASBR ˘ **default-information originate** ʒ Â

always ˘ OSPF a ˘ Â a ˘ ˘ ˩Л **show ipv6 ospf database** OSPF ˘ и 0.0.0.0 ÂOSPF **show ipv6 route** ʒ˘ ˩Л Â

˘ **default-information originate** ʒ ˘ a ʒ **default-metric** Â

OSPF ч ˘ 1 ˩˘ 2 a ˩ Â ч ˘ ˩ ˘ 1 2 ˝I ˘ Л show ipv6 route 1 Â

STUB ш a ˩Л Â

ð Ô

Ю ˘ ¦ '

```
default-information originate always
```

ð ¦Ô

¦	
redistribute	¦ Â
show ipv6 ospf	OSPFv3 Â
show ipv6 ospf database	OSPFv3 Â

35.1.8 default-metric

¦ ¦ ˘ ¦ **no**
Â

default-metric *metric-value*

no default-metric

ð Ô

metric-value	¦ Â 1-16777214˝ ѝ 20 Â

ð Ô

20

ð ¦ Ô

OSPFv3 Â

ð Ô

¦ ˩ **redistribute** ¦ ˘ ¦
Â ¦ ч '

1. **default-information originate** ¦ '
2. ¦ ˘ ¦ 20 ѝ Â

ð Ô

Ю ˘ ¦ metric ѝ 10˝

```
default-metric 10
```

ð ¦Ô

ч	
redistribute	↑ Â
show ipv6 ospf	OSPFv3 Â

35.1.9 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 ┘ Лυ 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 ЎĄ б OSPFv3 Â

no ipv6 router ospf ч a ЎĄ 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
```

ð ৡ Ô

ৡ	
ipv6 ospf prefix-filter	Э a Ὼ Â
ipv6 router ospf	╟ OSPFv3 Â

35.1.11 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

35.1.12 ipv6 ospf hello-interval

ꝛ Э Hello ˘ ꝛ **no**
Â

ipv6 ospf hello-interval *seconds* [**instance** *instance-id*]

no ipv6 ospf hello-interval [**instance** *instance-id*]

ð Ô

seconds	Hello Â 1-65535( ) Â
instance *instance-id*	OSPFv3

ð Ô

10

ð ꝛ Ô

Â

ð Ô

Hello ⊿˘
Â

ð Ô

Ю ˘ hello ѝ 20s'

```
ipv6 ospf hello-interval 20
```

ð ꝛ Ô

ꝛ	
ipv6 ospf dead-interval	Э ѝ Â
show ipv6 ospf interface	OSPFv3 Â
instance *instance-id*	OSPFv3

35.1.13 ipv6 ospf neighbor

ꝛ OSPFv3 ˘ ꝛ **no** Â

ipv6 ospf neighbor *ipv6-address* [[**cost** <1-65535>] [**poll-interval** <0-4294967295> | **priority** <0-255>]] [**instance** *instance-id*]

no ipv6 ospf neighbor *ipv6-address* [[**cost** <1-65535>] [**poll-interval** <0-4294967295> | **priority** <0-255>]] [**instance** *instance-id*]

ð Ô

cost <*1-65535*>	ˆ ˩ ˜ ˘ Ⱶ Э cost Â point-to-multipoint
poll-interval <*0-4294967295*>	ˆ ˩ ˜ ˘ Л ѝ Æ˘ 120 Â Non-broadcast(NBMA)
priority <*0-255*>	ˆ ˩ ˜ ˮ ˘ ѝ˚ Â Non-broadcast(NBMA)
instance *instance-id*	OSPFv3

ð ʒ Ô

Â

ð Ô

Â

ð Ô

Â

ð ٦ Ô

ð Ô

┘Л Ў Â

ð Ô

Ю Ў б OSPFv3 ѝ '

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

ð ٦ Ô

٦	
ipv6 ospf priority	″I Â
show ipv6 ospf interface	OSPFv3 Â

˘ 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

35.1.16 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*]

ð Ô

seconds	LSA Â 1-65535( ) Â
instance *instance-id*	OSPFv3

ð Ô

5

ð ʒ Ô

Â

ð Ô

ѝ ˩ ˘ LSA ˘
Â ˩Л˅ ˘ ꝛ
˘ ˘ LSA Â

ð Ô

Ю ˘ LSA ѝ 10s'

```
ipv6 ospf retransmit-interval 10
```

ð ꝛ Ô

ꝛ	
show ipv6 ospf interface	OSPFv3 Â
instance *instance-id*	OSPFv3

35.1.17 ipv6 ospf transmit-delay

ꝛ Э LSA ˘ ꝛ **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 ꝛ Ô

Â

ð Ô

ꝛ Э LSA Â

ð Ô

Ю ˘ Э LSA '

```
ipv6 ospf transmit-delay 2
```

ð ¾ Ô

¾	
show ipv6 ospf interface	OSPFv3 Â

35.1.18 ipv6 router ospf

¾ OSPFv3 ˘ ¾ **no** OSPFv3 Â

ipv6 router ospf *process-id*

no ipv6 router ospf *process-id*

ð Ô

process-id	OSPF /\

ð Ô CÃEO/È S*ÆQ¸X **ipv6 router ospf**

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

35.1.20 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

ЮO max-concurrent-dd

35.1.22 redistribute

ǂ OSPF ˘ Л *match* ˘ ǂ OSPF
˘ ˘ ѝ ǂ OSPF Â

ǂ route-map *match*
ר ' ǂ tagў *metric* б *metric-type* ″I æ
route-map *set* ″I '

ð Ô

Ю ˘ ǂ ˘ route-map tesf ѝ match metric 20 б set metric 30˜ '

```
redistribute connect metric  10 route-map test
```

ЛЪЭ ৡ ℸ ˘ ǂ metric ѝ 20 ˘ ѐ metric ѝ 30ʼ

ð ৡ Ô

ৡ	
default-information originate	ǂ Â
default-metric	ǂ Â
summary-prefix	Â
show ipv6 ospf	OSPFv3 Â
show ipv6 ospf database	OSPFv3 Â

35.1.23 router-id

ৡ (Router ID)ў ৡ **no**
Router IDў Router ID Â

router-id *router-id*

no router-id

ð Ô

ð Ô

л OSPFv3 Router ID ˘ Router ID IPv4 Â

a л OSPFv2˝ OSPFv2 ╠ л IPv4 и Router ID˘ ╠ OSPFv3 л˘ **Router-id** ч и OSPFv3 Router ID˘ OSPFv3 ╠ Â

a л Router ID Â

OSPFv3 ╠ л˘ б OSPFv3 Router ID˘ Э OSPFv3 ˘ a ¨Ą Router ID˘ и Router ID˘ OSPFv3 Лъ OSPF Â

Router ID˘ OSPFv3 ˘ л˘ ¨I Router ID Â

ð Ô

Ю ˘ б OSPFv3 и 1.1.1.1'

```
router-id 1.1.1.1
```

ð ч Ô

ч	
ipv6 ospf priority	¨I Â
show ipv6 ospf	OSPFv3 Â

35.1.24 timers spf

OSPFv3 л ˘ SPF ˘ Лъ ч SPF ˘ ч **timers spf** Â ч **no** Â

timers spf *delay holdtime*

no timers spf

ð Ô

delay	ÿ л ╠ SPF Â 0-214748364 ( )˘ 5 Â
holdtime	ÿ л ╠ SPF Â 0-214748364 ( )˘ 10 Â

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 ¾Ô

¾	
clear ipv6 ospf	¾ ╟ OSPFv3 ↑ ╗ Â
show ipv6 ospf	OSPFv3 Â

35.2

35.2.1 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 Ъ Ƈ Ъ Ъ ⌐

default-metric	↑ Â
router-id	OSPFv3 Â
timers spf	OSPFv3 ↓ ˘ SPF ˘ Л∪ ч SPF Â

35.2.2 show ipv6 ospf database

OSPFv3 Â

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

ð Ô

process- id	OSPF Л , 1-65535.
lsa-type	lsa ˘ ЛЬЮ ' external à link à inter-prefix à inter-router à intra-prefix à network à router à te ˘ lsa
adv-route*r router-id*	router LSA Â

ð ʒ Ô

Â

ð Ô

Ю OSPFv3

```
Ruijie# show ipv6 ospf database
     OSPFv3 Router with ID (1.1.1.1) (Process 1)
        Link-LSA (Interface FastEthernet 1/0)
Link State ID   ADV Router      Age  Seq#       CkSum
Prefix
0.0.0.2         1.1.1.1         197 0x80000001 0x7cd8
0
0.0.0.5         2.2.2.2         206 0x80000001 0x8c86
0
Link-LSA (Interface Loopback 1)
Link State ID   ADV Router      Age  Seq#       CkSum
Prefix
0.0.64.1        1.1.1.1          82 0x80000001 0xb760
0
```

```
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 WV1’ H’Ð1’ H‘!a¥ÐÆRC˜–yÐcu 1–’æP

```
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

¾	
ipv6 router ospf	╟ OSPFv3 Â
ipv6 ospf area	╟ OSPFv3 Â

35.2.4 show ipv6 ospf neighbor

OSPFv3 Â

show ipv6 ospf [*process- id*] **neighbor** [*interface-type interface-number* [**detail**]| *neighbor-id* |**detail**]

ð Ô

process- id	OSPFv3 /I , 1-65535.
detail	Â

interface-type inte

```
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

35.2.5 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

ЮО 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 ¾Ô

¾	
ipv6 router ospf	╟ OSPFv3 Â

35.2.6 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

ð ¾ Ô

Â

ð Ô

ЮО 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   --
```

ð ¾Ô

¾	
ipv6 router ospf	╟ OSPFv3 Â
area range	OSPF ѱ

35.2.7 show ipv6 ospf virtual-links

OSPFv3 Â

show ipv6 ospf [*process- id*] **virtual-links**

ð Ô

process- id	OSPFv3 Л , 1-65535.

ð ¾ Ô

Â

³	
ipv6 router ospf	╟ OSPFv3 Â
area virtual-link	OSPFv3 Â ╟ OSPFv3

36 IGMP

36.1 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**
- **ip igmp last-member-query-interval**
- **ip igmp limit ( )**
- **ip igmp query-interval**
- **ip igmp query-max-response-time**
- **ip igmp querier-timeout**
- **ip igmp robustness-variable**
- **ip igmp version**
- **ip igmp limit ( )**
- **ip igmp prn6 Tw[(ip ig)5.7(mp prn6 Tw[(ip ig)5.7(mp prn6 Tw[(ip ig)5.7(mp prn6 T**
-

clear ip igmp group[*group-address* | *interface-type interface-number*]

ð Ô

group-address	32 Æ IP D ˘ 8 Æ ˘ Л∪ ⁸ ˘
interface-type	
interface-number	/\

ð ˀ Ô

ð Ô

IGMP ˘ ѝ ѐ ў ╗ , ≠ ╗ ˘ ≠ Âÿ IGMP ˘ ┘Л∪ a **clear ip igmp group** ˀ Â

ð Ô

'

```
Ruijie# clear ip igmp group
```

ð ˀ Ô

show ip igmp groups

show ip igmp interface

36.1.2 clear ip igmp interface

ˀ IGMP Â

ð ˀ Ô

clear ip igmp interface *ifname*

ð Ô

ifname	┘

ð Ô

ð ⅋ Ô

ð Ô

⅋ Э IGMP Â ⅃ Л υ a ifname Â

ð Ô

```
Ruijie# clear ip igmp interface eth1
```

36.1.3 ip igmp access-group

⅋ Э ⁸ Â ⅋ no ⅃ Л υ ⅄ ╖ Â

ð ⅋ Ô

ip igmp access-group *access-list*

no ip igmp access-group

ð Ô

access-list	⁸ ⅄ , <1-199>| <1300-2699> | WORD

ð Ô

ð ⅋ Ô

ð Ô

ў ⅃ Л υ ╗ ˘ ⅃ Л υ **ip igmp access-group** ⁸ Â

ð Ô

Ю ˘ ў Ь Eth0 ╗ 225.2.2.2.

```
Ruijie# configure terminal
Ruijie(config)# access-list 1 permit 225.2.2.2 0.0.0.0
Ruijie(config)# interface ethernet 0
Ruijie(config-if)# ip igmp access-group 1
```

36.1.4 ip igmp join-group

ֿ ╗ ˘ ֿ ╗ no ↓ Â

ð ֿ Ô

ip igmp join-group *group-address*

no ip igmp join-group *group-address*

ð Ô

group-address	Э ╗ ў

ð Ô

╗ ў

ð ֿ Ô

ð Ô

ֿ ѓ ў ѝ˘ ў ╠ ↓ Л∪
⌐ Â

ð Ô

Ю ˘ Eth0 ╗ 233.3.3.3 Â .

```
Ruijie# configure terminal
Ruijie(config)# interface ethernet 0
Ruijie(config-if)# ip igmp join-group 233.3.3.3
Ruijie(config-if)# exit
```

36.1.5 ip igmp static-group

ֿ ╗ ˘ ֿ ╗ no ↓
Â

ð ֿ Ô

ip igmp static-group *group-address*

no ip igmp static-group *group-address*

ð Ô

group-address	Э ╗

ð Ô

╗

ð ३ Ô

ð Ô

३ ╗ ˘ ╗
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
```

36.1.6 ip igmp immediate-leave group-list

IGMPversion2 IGMPversion3 ˘ ३Л
Â ३ ў ЮÂ
३ no ↙ ╗ Â

ð ३ Ô

ip igmp immediate-leave group-list *access-list*

no ip igmp immediate-leave group-list

ð Ô

access-list	8 ↓

ð Ô

ð ३ 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

ð Ô

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

36.1.7 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

Â

ð Ô

ṗ

IGMPv2 ˘ **ip igmp**

last-member-query-count ╖ Э ˘

˘ Â

ð Ô

Л й 3.

```
Ruijie# configure terminal
Ruijie(config)# interface ethernet 0
Ruijie(config-if)# ip igmp last-member-query-count 3
```

36.1.8 ip igmp last-member-query-interval

Ҏ й

ip igmp immediate-leave

36.1.9 ip igmp limit ( )

३ igmp states Â ˇ no
Â

ð ३ Ô

ip igmp limit *number* [**except** *access-list*]

no ip igmp limit

ð Ô

	IGMP ˇ é ъ

number

ip igmp query-interval *seconds*

no ip igmp query-interval

ð Ô

seconds	Â Æ sˇ 1˙ 18000

ð Ô

125 Â

ð ֽ Ô

ð Ô

˩ 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
```

36.1.11 ip igmp query-max-response-time

ֽ ˇ ˩ ՈՄ no ѝ Â

ð ֽ Ô

ip igmp query-max-response-time *seconds*

no ip igmp query-max-response-time

ð Ô

seconds	ˇ Æ sˇ 1˙ 25

ð Ô

10s Â

ð ֽ Ô

IGMP ३

ð Ô

Ethernet 0 ˘ è ѝ Â

```
Ruijie(config-if)# no ip igmp query-timeout
```

36.1.13 ip igmp robustness-variable

ֽ ˩ Л ˩ ˩ ˘ ˘
ֽ ╗ no Â

ð ֽ Ô

ip igmp robustness-variable *number*

no ip igmp robustness-variable

ð Ô

{**1	2	3**}	Ь Л˘ ѝ <1-3>

ð Ô

Ю Л ѝ 2.

ð ʒ Ô

ð Ô

igmp Л˘ Л˘ igmp ╠ Â

ð Ô

ЛЪЮ Л ѝ 2ʹ

```
Ruijie# configure terminal
Ruijie(config)# interface ethernet 0
Ruijie(config-if)# ip igmp version 2
```

36.1.15 ip igmp limit ( )

ʒ ˩Л igmp Â ˩ ˘ no Â

ð ʒ Ô

ip igmp limit *number* [**except** *access-list*]

no ip igmp limit *number* [**except** *access-list*]

ð Ô

number	IGMP ˘ ɛ
except	ˆ ˩ ˜ access-list a б ˘ a ˩ limit [8]
access-list	ˆ ˩ ˜ ˩

ð Ô

ѝ 65536 Â

ð ʒ Ô

ð Ô

ʒ IGMP ˇ
ˇ ˆ a IGMP ˇ a Â

ʒ ˩Л ˇ ˩Л ˇ
= œ

ð Ô

ЛЮ ˇ ù 300

```
Ruijieˆ configˆ # ip igmp limit 300
```

36.1.16 ip igmp proxy-service

ʒ ╫ Ю mroute-proxy ┗╖ Â Э
ʒˇ ù mroute-proxy Э ˇ Ю
ˇ Ю Э Â

ip igmp proxy-service

no ip igmp proxy-service

ð Ô

a ù proxy-service ˛

ð ʒ Ô

ð Ô

ʒ ˩ ˇ 32 Â
proxy-service Ю ˩Л 255 Ю Â
˙ˇ proxy-service ˇ Â
proxy-service ÿ mroute-proxy
Â ˇ proxy-serviceˇ
ў ùˇ a ù.

switchport ˇ Ю **ip igmp mroute-proxy interface** ʒ ╫ Â

ð Ô

ù proxy-service

```
Ruijie(config-if)# ip igmp proxy-service
```

36.1.17 ip igmp mroute-proxy

ʒ ˇ ˩Л è Э Â

IGMP ३

36.1.19 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.
```

36.1.20 show ip igmp groups

ֽ б ÿ IGMP ˊ 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	/1

detail

ð ʒ Ô

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

ð Ô

interface-type	
interface-number	/ˆ

ð Ô

ð ʒ Ô

ð Ô

Ю й '

```
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
```

36.1.22 show ip igmp ssm-mapping

ʒ IGMP ssm-map ˘ ʒ Ю'

show ip igmp ssm-mapping [*A.B.C.D*]

ð Ô

A.B.C.D	

ð Ô

IGMP ssm-map Â

ð ¸ Ô

ð Ô

˘ ¯ Â

ð Ô

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
```

37 PIM-DM

37.1 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**

37.1.1 ip pim dense-mode

Э PIM-DM **ip pim dense-mode** ¾ Â
¾ no Э PIM-DM Â

ip pim dense-mode

no ip pim dense-mode

ð Ô

¾ Â

ð Ô

PIM-DM Â

ð ¾ Ô

ð Ô

```
Ruijie# configure terminal
Ruijie(config)# interface fastethernet 0/1
Ruijie(config-if)# ip pim dense-mode
```

📖

╟ PIM-DM ˘ Ю ╟ ╖ ˘
╟ PIM-DM˝ ≠ a Â

╟ PIM-DM ˩ ˘ IGMP Э╡ ╟ ╟˘ a ╟
Â

ʒ ˘ l' Failed to enable PIM-DM on < ˩ >, resource temporarily unavailable, please try again Ł˘ ¨Ą
ʒ Â

ʒ ˘ l' PIM-DM Configure failed! VIF limit exceeded in NSM!!! Ł˘ ˩
Э Â ÿ Ю PIM-DM ˘
a PIM-DM PIM-SM DVMRP Â

a ˩ ˨ Э a ˩ a ˩ v4 Â

37.1.2 ip pim neighbor-filter

Э ˘ **ip pim neighbor-filter** ʒ Â
˘ PIM-DM a б
ˆ Peering˜ ˘ б
Â

ʒ no ˩Л ╖ Â

ip pim neighbor-filter *access-list*

no ip pim neighbor-filter *access-list*

ð Ô

access-list	/ł ˘ ˩ ˩ Â

ð Ô

╖ Â

ð ʒ Ô

ð Ô

```
Ruijie# configure terminal
Ruijie(config)# interface fastethernet 0/1
Ruijie(config-if)# ip pim neighbor-filter 14
```

---

ip pim neighbor-filter ¾ '

1. ACL ˚ ù PIM ˇ ACL ù PIM Â
2. ^ peering˜ ˇ PIM Â б PIM ˇ a б ˇ ≠ a PIM Â

37.1.3 ip pim query-interval

hello interval ˇ **ip pim query-interval** ¾ Â

¾ no ⅃ Л∪ hello interval Â

ip pim query-interval *interval-seconds*

no ip pim query-interval

ð Ô

interval-seconds	⅃ ù <1-65535>˘ Æ ù

ð Ô

30 Â

ð ¾ Ô

ð Ô

hello interval˝ hello holdtime ù hello interval 3.5 Â

ð Ô

```
Ruijie# configure terminal
Ruijie(config)# interface fastethernet 0/1
Ruijie(config-if)# ip pim query-interval 123
```

37.1.4 ip pim state-refresh disable

Э PIM-DM 9 ˘ **ip pim state-refresh disable** ৡ Â ৡ no PIM-DM ‖

ip pim state-refresh origination-interval *interval-seconds*

no ip pim state-refresh origination-interval

ð Ô

interval-seconds	¼ <1-100>˘ Æ ¸ Â

ð Ô

60 Â

ð ¾ Ô

ð Ô

```
Ruijie# configure ie#
```

```
50.50.50.50   VLAN 4                2      v2/D    1
```

Neighbor-Address	
Interface	б
Uptime/Expires	Лυ
Ver	PIM

37.1.8 show ip pim dense-mode nexthop

PIM-DM Ю ˘ **show ip pim dense-mode nexthop** ȝ Â

show ip pim dense-mode nexthop

ð Ô

ð ȝ Ô

/ /

ð Ô

ЛυЮ ȝ 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
Metric	
Pref	″I

37.1.9 show ip pim dense-mode mroute

PIM-DM ˘ **show ip pim dense-mode mroute** ȝ Â

show ip pim dense-mode mroute [*A.B.C.D A.B.C.D*] **[summary]**

ð Ô

A.B.C.D A.B.C.D	
summary	

ð ֳ Ô

/ /

ð Ô

ЛЬЮ ֳ PIM-DM '

```
Ruijie# show ip pim dense-mode mroute
PIM-DM Multicast Routing Table
(1.1.1.111, 229.1.1.1)
MRT lifetime expires in 205 seconds
RPF Neighbor: 50.50.50.1, Nexthop:50.50.50.1,VLAN 4
Upstream IF: VLAN 4
Upstream State: Pruned, PLT:200
Assert State: NoInfo
Downstream IF List:
FastEthernet 0/45:
Downstream State: NoInfo
Assert State: Loser, AT:170
```

- **show ip pim sparse-mode interface**
- **show ip pim sparse-mode local-members**
- **show ip pim sparse-mode mroute**
- **show ip pim sparse-mode neighbor**
- **show ip pim sparse-mode nexthop**
- **show ip pim sparse-mode rp mapping**
- **show ip pim sparse-mode rp-hash**

38.1.1 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
```

38.1.2 clear ip mroute statistics

ð ¾ Ô

clear ip mroute statistics {* | *group_address* [*source_address*] }

ð Ô

*	Â

group_address	Â

group_address

ð ৡ Ô

ð Ô

╟ ˘ ৡ Â Э ╟ PIM-SM ˘ ≠
ৡˇ ˘ 8BÞmfr K Q2F p] Ú r Q Q Ø

[*hash-mask-length*][*priority-value*]

ð Ô

interface-type interface-number	

˩ ˘ ˩ ѝ <0-32>˘ ѝ RP

hash-mask-length ⁸ HASH ˘

ð Ô

access-list	access-list‘ <1˘ 99> à <1300˘ 1999>˘ Ù acl Â group-list access-list ˘ Â

ð Ô

˘ ¨Ą PIM ¨Ą
˘ PIM ˘ cisco Â

ð ¸ Ô

ð Ô

ł ¨Ą ù PIM
è ˘ ¨Ą PIM Â ù
˘ ¸ Â

ð Ô

e i #) gRuf Qi7#8 u R

ð ˛ Ô

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
```

38.1.9 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
```

38.1.10 ip pim jp-timer

ð ˛ Ô

ip pim jp-timer *interval-seconds*

ð Ô

access_list	access-listʻ acl ӥ 1-99ʼ ≠ ⅄ acl

ð Ô

˘ ╗

ð ҳ Ô

ð Ô

˘ ╗ PIM ˘ ⁸ Â
˘ PIM-SM а 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 ҳ Ô

access-list

38.1.13 ip pim query-interval

ð ҳ Ô

ip pim query-interval *interval-seconds*

ð Ô

interval-seconds	↓ ӥ <1-65535>˘ Æ ӥ

ð Ô

˘ Hello 30s

ð ҳ Ô

ð Ô

Hello ˘ Hello ≠ ЛЬЮ
' Hello й Hello 3.5 '
Hello * 3.5 > 65535˜ Hello й
65535 Â

ð Ô

```
Ruijie# configure terminal
Ruijie(config)# interface g 0/3
Ruijie(config-if)# ip pim query-interval 123
```

38.1.14 ip pim register-rate-limit

ð ¾ Ô

ip pim register-rate-limit *rate*

ð Ô

rate	register ˘ ы <1-65535>

ð Ô

˘ a ¨Ą

ð ¾ Ô

ð Ô

¾ ˆ S˜ G˜ ¨Ą ˘ a
¨Ą Â ╟ ¾ æ DR RP
˘ a ⁸ ¨Ą Â

ð Ô

```
Ruijie# configure terminal
Ruijie(config)# ip pim register-rate-limit 3000
```

38.1.15 ip pim register-rp-reachability

ð ¾ Ô

ip pim register-rp-reachability

ð Ô

ð Ô

Ю˘ ̈Ą ˘ a RP ┘

ð ҳ Ô

ð Ô

ҳ Л˘ ̈Ą RP ┘ ˘ a ┘ ˘ a ̈Ą Â

ð Ô

```
Ruijie# configure terminal
Ruijie(config)# ip pim register-rp-reachability
```

38.1.16 ip pim register-source

ð ҳ Ô

ip pim register-source {*local_address* | *interface-type interface-number*}

ð Ô

local_address	̈Ą IP
interface-type interface-number	IP й ̈Ą IP

ð Ô

˘ ̈Ą IP б DR

ð ҳ Ô

ð Ô

ҳ Л˘ ̈Ą IP Â

┘ Â RP ̈Ą ˘ Лu ̈Ą IP й Register-Stop Â

~

a ╟ PIM-SM Â

ð Ô

```
Ruijie# configure terminal
Ruijie(config)# ip pim register-source 192.168.195.80
Ruijie(config)# ip pim register-source g 0/3
```

38.1.17 ip pim register-suppression

ð ৡ Ô

ip pim register-suppression *seconds*

ð Ô

seconds	”Ą ⁸ ˘ ↓ <11-21843>˘ Æ ŕ Â

ð Ô

˘ ”Ą ⁸ 60 Â

ð ৡ Ô

ð Ô

DR Э ⅟ DR Э ”Ą ⁸ ’ ip pim rp-register-kat ৡ ˘ RP Э ⅟ RP keepalive Â

ð Ô

```
Ruijie# configure terminal
Ruijie(config)# ip pim register-suppression 100
```

38.1.18 ip pim rp-address

ð ৡ Ô

ip pim rp-address *rp-address* [*access_list*]

ð Ô

rp-address	RP IP
access_list	↓ ˘ access-list˙ acl ŕ <1-99> à <1300-1999>’ ≠ ↓ acl Â ˘ Â

ð Ô

˘ RP

ð ֽ Ô

ð Ô

RP˝ ≠ RP BSR ⁸ ⊿
Â ֽ Ю '

- BSR ⁸ RP ⊿ ˘ ″I ╟ Â
- RP ⊿Л∪ ˆ ACL˜
  ˆ a ACL˜ ˘ RP a
  Â
- RP ⊾ ⊿ ˘ IP RP ″I
  Â
- ACL ⊮ ÂACL ˘
  ϶ 224/4 Â
- ⊿˘ RP RP
  ˘ RP ˘
  IP Â ϶ RP˝
  ˘ ≠ IP ″I Э Â
- RP ˘ ÿ
  RP ϶ 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

38.1.19 ip pim rp-candidate

ð ֽ Ô

ip pim rp-candidate *interface-type interface-number [***priority** *priority-value][i***nterval** *interval-seconds][***group-list**

interface-type interface-number	
priority-value	৶ ˘ ৶ ѝ <0-255>˘ priority priority-value ˘ ˝l 192
Interval-seconds	৶ ˘ ৶ ѝ <1-16383> ˘ interval interval-seconds ˘ interval-seconds 60s
access_list	৶ ˘ acl ѝ 1-99ʼ ≠ ৸ aclʼ group-list access_list ˘ Â

ð Ô

˘ RP

ð ৡ Ô

ð Ô

PIM-SM ˘ RPT Л∪ RP ѝ Â
BSR ৸˘ C-RP BSR C-RP ˘ ¨Ą BSR PIM Â

ѝ RP˘ ѫ ৡ ৶ Л∪ Э acl Â permit ace˘ a deny ace Â

ð Ô

```
Ruijie# configure terminal
Ruijie(config)# ip pim rp-candidate g 0/3
Ruijie(config)# ip pim rp-candidate g 0/3 priority 200
group-list 3 interval 70
Ruijie(config)# access-list 3 permit 225.1.1.1
0.0.0.255
```

ð ৡ Ô

access-list

38.1.20 ip pim rp-register-kat

ð ৡ Ô

ip pim rp-register-kat *seconds*

ð Ô

seconds	KAT Â ¼ <1-65535>˘ Æ ¼ Â

ð Ô

˘ RP Э KAT 210s Â

ð ¾ Ô

ð Ô

RP KAT

ð Ô

```
Ruijie# Dfigure terminal
Ruijie(TD1]g)#  ip pim rp-register-kat 250
```

38.1.21 ip pim sparse-mode

ð ¾ Ô

ip pim sparse-mode

ð Ô

ð Ô

Э˘ PIM-SM ╟

ð ¾ Ô

ð Ô

Э PIM-SM ˘ ¾ Â

ð Ô

```
Ruijie# Dfigure terminal
Ruijie(TD1]g)#  interface g 0/3
Ruijie(TD1]g-if)#  ip pim sparse-mode
```

🕮

╟ PIM-SM ˘ Ю ╟ ╖ ˘
╟ PIM-SM ≠ a Â

╟ PIM-SM ⅄ ˘ IGMP Э╡ ╟ ╟˘ a ╟
Â

٪ ˘ ľ Failed to enable PIM-SM on < ⅄
>, resource temporarily unavailable, please try again Ł˘ ΎĄ
٪ Â

٪ ˘ ľ PIM-SM Configure failed! VIF limit
exceeded in NSM!!! Ł˘ ⅄
Э Â ÿ Ю PIM-SM ˘
a PIM-SM PIM-DM DVMRP Â

a ⅄ ⅄ Э a ⅄ a ⅄ v4 Â

38.1.22 ip pim spt-threshold

ð ٪ Ô

ip pim spt-threshold [**group-list** *access-list*]

ð Ô

access-list	⅄ ˘ access-list acl ы 1-99 à 1300-1999 ≠ ⅄ acl Â group-list access-list ˘ SPT ╡

ð Ô

˘ a ╟ SPT ╡

ð ٪ Ô

SPT

ð Ô

RPT SPT ↓ ╖ ˘ ٪'

SPT ð ο '

ð ¾Ô

access-list

38.1.23 ip pim ssm

ð ¾ Ô

ip pim ssm { **default** | **range** *access_list}*

ð Ô

default	ù' 232/8
access_list	acl ù 1-99' ≠ ɹ 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 ù 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

38.1.24 show debugging

ð ¸ Ô

/ /

ð Ô

ð Ô

```
Ruijie #show debugging
PIM-SM Debugging status:
  PIM packet debugging is on
```

38.1.25 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
```

38.1.26 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*	¼ ˘ ˘ ¾
detail	¼ ˘

ð ¾ 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
```

38.1.27 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:
```

38.1.28 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

38.1.30 show ip pim sparse-mode nexthop

ð ¾ Ô

show ip pim sparse-mode rp-hash *group-address*

ð Ô

group-address	

ð ¾ Ô

/ /

ð Ô

RP Â

ò Ô

```
Ruijie# show ip pim sparse-mode rp-hash 225.1.1.1
   RP: 30.30.100.1
   Info source: 30.30.100.1, via bootstrap
```

39

39.1

- **clear ip mroute**
- **clear ip mroute statistics**
- **ip mroute**
- **ip multicast route-limit**
- **ip multicast ttl-threshold**
- **ip multicast-routing**
- **ip multicast-rpf**
- **ip multicast boundary**
- **ip multicast static**
- **show ip mroute**
- **show ip rpf**
- **show ip mvif**

39.1.1 clear ip mroute

IP Â

clear ip mroute {* | *group-address* [*source -address*]}

Ô

*	Â
group-address	Â
source -address	Â

Ô

Â

Ô

Â

Ô

Â

ð Ô

ЛЬЮ ѝ ѝ 230.0.0.1 '

```
Ruijie# clear ip mroute 230.0.0.1
```

ð ϡ Ô

ϡ	
show ip mroute	Â

ð ѵ Ô

Â

39.1.2 clear ip mroute statistics

ϡ IP Â

clear ip mroute statistics {***** | *group-address* [*source -address*]}

ð Ô

*	Â
group-address	Â
source -address	Â

ð Ô

Â

ð ϡ Ô

Â

ð Ô

IP Â

ð Ô

ЛЬЮ ѝ ѝ 230.0.0.1
'

```
Ruijie# clear ip mroute statistics 230.0.0.1
```

ð ϡ Ô

show ip mroute

clear ip mroute

ð ⊿ Ô

Â

39.1.3 ip mroute

Â ʒ no Â

ip mroute *source-address mask* [*protocol*] {*rpf-addrress* | *interface-type interface-number*} [*distance*]

no ip mroute *source-address mask* [*protocol*] {*rpf-addrress* | *interface-type interface-number*} [*distance*]

ð Ô

source-address	
mask	
protocol	ˆ ⊿ ˜
rpf-address	
interface-type interface-number	/|

ϡ TTLˆ Time-To-Liveˇ 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' и 1 Â

ð ϡ Ô

Â

ð Ô

┘ЛЪ и TTL Â TTL
ˇ ┘ЛЪ ˇ ÂTTL
ˇ ┘ Ь Э Â TTL и 0 ˇ
a и Â

ð Ô

ЛЪЮ Э TTL и 5

```
Ruijie(config-if)# ip multicast ttl-threshold 5
```

39.1.6 ip multicast-routing

ϡ ╠ Â ϡ **no** Â

ip multicast-routing

no ip multicast-routing

ð Ô

Â

ð ϡ Ô

Â

ð Ô

ϡ ╠ IPv4 Â ╠ IPv4 ˇ
≠ a ╠ Â

~

S3760 Э˘ ╖ IGMP SNOOPING Â

ð Ô

ЛЬЮ ╟ Â

```
Ruijie(config)# ip multicast-rounting
```

a ⅄ ⅄ Э a ⅄ a ⅄ v4

39.1.7 ip multicast-rpf

RPF Â

ip multicast-rpf *rpf-mode*

no ip multicast-rpf

ð Ô

rpf-mode	routed-porť Э ѝ ’ Svĭ Э ѝ SVI Â

ð Ô

ѝ SVI

ð ʒ Ô

ð Ô

S3760 ʒ Â

S3760 ˘ SVI RPF ˘

RPF ˘ ʒ˘ з ѝ routed-port Â S3760 SVI RPF Â

39.1.8 ip multicast boundary

IP IP Â ϡ **no**
Â

ip multicast boundary *access-list*

no ip multicast boundary *access-list*

ð Ô

access-list	IP access-list ѝ ACL

ð Ô

ð ϡ Ô

ð Ô

IP IP Â ϡ ACL ↓Л∪
ACL˘ ≠ ↓Л∪ ACL˘ ACL ┐ ˘ a
┐ Â

~

ϡ ↓Л∪ IP IGMP àPIMSM ˘
a ÿ Â

ð Ô

svi1 ѝ IP Â

```
Ruijie(config)# ip access-list mul-boun
Ruijie(config-std-nacl)# permit ip 233.3.3.0 0.0.0.255
Ruijie(config-std-nacl)# exit
Ruijie(config)# interface vlan 1
Ruijie(config-if)# ip multicast boundary mul-boun
```

39.1.9 ip multicast static

ϡ γ ⁸ Â ϡ no ↓Л∪↓ Â

ip multicast static *source-address group-address interface-type interface-number*

no ip multicast static *source-address group-address interface-type interface-number*

ð Ô

source -address	Â

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

Â

ð ȝ Ô

ð Ô

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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	
Outgoing interface list	
Forwarding Counts ' Pkt count/Byte count,	' /
Other Counts: Wrong If pkts	

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
```

39.1.12 show ip mvif

Â

show ip mvif { *interface-type interface-number* }

ð Ô

interface-type interface-number	

ð Ô

Â

ð ϡ Ô

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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
```

39.2 IP

Ю ৡ ╟ IP '

- **debug nsm mcast all**
- **debug nsm mcast fib-msg**
- **debug nsm mcast vif**
- **debug nsm mcast register**
- **debug nsm mcast stats**

39.2.1 debug nsm mcast all

Â ৡ **no**

debug nsm mcast all

ð Ô

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˘ ⅄ Ո Â

ð Ô

```
Ruijie# debug nsm mcast all
```

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39.2.2 debug nsm mcast fib-msg

Â **no**

debug nsm mcast fib-msg

ð Ô

40

40.1

ЛЬЮ ҳ

- **strom-control**
- **switchport protected**
- **switchport port-security**
- **switchport port-security aging**
- **switchport port-security mac-address**
- **port-security arp-check**

40.1.1 strom-control

8 Â ҳ **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 ↑ 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 ЛъЭ ' Лъ 8M ѝ Æ

ð Ô

Ю˘ ầ 8 ╗

ð ҳ Ô

Â

ð Ô

Э à ˘
˘ ˩ ╗ Â
˩ Â

˩ Л↯ à 8 Â à
˘

^ ~ Â

show storm-control ч Â

ð Ô

Ю GigabitEthernet 1/1 Э 8
╗ ˘ з ѝ 4M

```
Ruijie# configure terminal
Ruijie(config)# interface GigabitEthernet 1/1
Ruijie(config-if)# storm-control multicast 4096
Ruijie(config-if)# end
```

ð ч Ô

ч	
show storm-control	8 Â

ð ˥ Ô

40.1.2 switchport protected

ч ѝ Â ч **no** Â

switchport protected

no switchport protected

ð Ô

ð ч Ô

ð Ô

ѝ ˥˘ Ю a
γ ˩Л з ˘ б ˩Л Â
show interfaces ч

ð Ô

```
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# switchport protected
```

ð ȝ Ô

ȝ	
show interfaces	Â

ð ȷ Ô

S32 S37 Э˘ a ˘ Ю a acĭ
≠ a ѝ ȷ ˘ ѝ Э è
Â

40.1.3 switchport port-security

Ⅶ ˘ Â ȝ no
˘ Â

switchport port-security [**violation** {**protect** | **restrict** | **shutdown**}]

no switchport port-security [**violation**]

ð Ô

/TT3 1 Tf10.5 0 0 TD-0TD0 Tc0 Tw♭74192353c1b8d1e1403e15ŦT2 1 Tf26 0 T( )Tj/TT5 1

˘ ˆ è ѝ M
˜ Â

ð Ô

Ю Gigabitethernet 1/1 Э ╖ ˘
ѝ shutdown'

```
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# switchport port-security
Ruijie(config-if)# switchport port-security
violation shutdown
```

ð ϡ Ô

ϡ	
show port-security	Â

40.1.4 switchport port-security aging

ϡ ѝ Э Â ╖ ˘
˘ ˘ ┘Л ╟ ╗
Э Â ϡ no ╟ ╭
˘ ╖ Â

switchport port-security aging {**static** | **time** *time* }

no switchport port-security aging {**static** | **time** }

ð Ô

Static	┘ ╟ ╭ ˘ ╟ ╭ Â
time time	Э ˘ 0˙ 1440˝ Æ ˦ Â ѝ 0˝ ╖ Э Â

ð Ô

a

ð ϡ Ô

ð Ô

┘Л Ю ϡ **no switchport port-security aging time** ╖ ˘ ϡ **no switchport**

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 ¾ Ô

¾	
show port-security	Â

40.1.5 switchport port-security mac-address

Â ¾ no ˘
Â

switchport port-security [**mac-address** *mac-address* [**ip-address** *ip-address*]] | [**maximum** *value*]

no switchport port-security [**mac-address** *mac-address* [**ip-address** *ip-address*]] | [**maximum**]

ð Ô

mac-address *mac-address*	Â
ip-address *ip-address*	ì IP Â
ip-address *ipv6-address*	ì IPV6 Â
maximum *value*	Â

ð Ô

ð ¾ Ô

ð Ô

ل IP MAC ´ ˚ б
ACL Э ´ ˚ ˘
Э ACL 802.1x ╖ ˘ IP ˘
Э IP

ð Ô

Ю ѝ gigabitethernet 1/1 '
00d0.f800.073c˘ ѝ è IP ' 192.168.12.202'

```
Ruijie# configure terminal
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# switchport mode access
```

¾	
show port-security	Â

40.2

ЛЬЮ ¾

- **show storm-control**
- **show port-security**

40.2.1 show storm-control

8 Â

show storm-control [*interface-id*]

ð Ô

interface-id	8 Â

ð Ô

ð ¾ Ô

ð Ô

```
Ruijie# show storm-control gigabitethernet 1/1
Interface Broadcast Control Multicast Control Unicast
Control
------------------------------------ --------------
Gi1/1 Disabled Disabled Disabled
```

ð ¾Ô

¾	

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

41 802.1X

41.1 dot1x

dot1x ў ╟ ٹ ЛЬЮ

- **dot1x auto-req**
- **dot1x auto-req packet-num**
- **dot1x auto-req req-interval**
- **dot1x auto-req user-detect**

41.1.1 dot1x auto-req

802.1X ў ╟ ╖ ˘ ٹ **dot1x auto-req** Â
ٹ **no** ↓ ў ╟ ╖ Â

[**no**] **dot1x auto-req**

ð

```
Req-Interval: 30 Second
```

ð ʒ Ô

ʒ	
show dot1x auto-req	ў ╠

41.1.2 dot1x auto-req packet-num

ў ╠ ˘ no й

dot1x auto-req packet-num *num*

no dot1x auto-req packet-num

ð Ô

num' ў ╠

ð Ô

num = 0;

ð ʒ Ô

Â

ð Ô

ў ╠ ˘ ㄴ Л∪ **show dot1x auto-req** ʒ ╖

ð Ô

Ю ў ╠ 802.1x '

```
Ruijie# configure terminal
Ruijie(config)# dot1x auto-req packet-num 0
Ruijie(config)# end
Ruijie# show dot1x auto-req
Auto-Req: Enabled
User-Detect : Enabled
Packet-Num  : 0
Req-Interval: 30 Second
```

ð ʒ Ô

ʒ	
show dot1x auto-req	ў ╠

41.1.3 dot1x auto-req req-interval

ў ╟ ˘ **no** ѝ

dot1x auto-req req-interval *interval*

no dot1x auto-req req-interval

ð Ô

interval ў ╟ ˘ Æ s

ð Ô

30

ð ٩ Ô

Â

ð Ô

ў ╟ ˘ ┘Л **show dot1x auto-req** ٩ ╖

ð Ô

Ю 802.1x ѝ 60s '

```
Ruijie# configure terminal
Ruijie(config)# dot1x auto-req req-interval 60
Ruijie(config)# end
Ruijie#
```

ð ٹ Ô

Â

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 ╠

41.2 dot1x

dot1x Л Ъ Ю ٹ

- **dot1x timeout quiet-period**
- **dot1x timeout re-authperiod**
- **dot1x timeout server-timeout**
- **dot1x timeout supp-timeout**
- **dot1x timeout tx-period**

41.2.1 dot1x timeout quiet-period

ٹ ^ ٹ ~ Л

^ ~ Â ٹ **no** й

dot1x timeout quiet-period

seconds ʌ Â
0 65535 Â Æ s

ð Ô

10 Â

ð ৡ Ô

Â

ð Ô

ʌˇ a ˇ Â ɔ ɲ
show dot1x ৡ Â

ð Ô

Ю ѝ 1000s

```
Ruijie# configure terminal
Ruijie(config)# dot1x timeout quiet-period 1000
Ruijie(config)# end
Ruijie# show dot1x
802.1X Status:       Enabled
Authentication Mode:  EAP-MD5
Authed User Number:   0
Re-authen Enabled:    Disabled
Re-authen Period:     3600 sec
Quiet Timer Period:   1000 sec
Tx Timer Period:      3 sec
Supplicant Timeout:   3 sec
Server Timeout:       5 sec
Re-authen Max:        3 times
Maximum Request:      3 times
Filter Non-RG Supp:   Disabled
Client Oline Probe:   Disabled
Eapol Tag Enable:     Disabled
Authorization Mode:   Group Server
```

ð ৡ Ô

ৡ	
show dot1x	802.1x

41.2.2 dot1x timeout re-authperiod

ʌˇ ৡ
ˇ Â ৡ **no** ѝ Â

dot1x timeout re-authperiod *seconds*

no dot1x timeout re-authperiod

ð Ô

*seconds*ˈ Â 0 65535 Â Æ s Â

ð Ô

3600

ð ৡ Ô

Â

ð Ô

ৰ Л **show dot1x** ৡ 802.1x Â

ð Ô

Ю ѝ 1000sˈ

```
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

41.2.3 dot1x timeout server-timeout

ʒ Ł Â ʒ

no ѝ Â

show dot1x	802.1x

41.2.4 dot1x timeout supp-timeout

ৡ Â ৡ no
ѝ Â

dot1x timeout supp-timeout *seconds*

no dot1x timeout supp-timeout

ð Ô

seconds' ˘ 0
65535 Â

ð Ô

3 Â

ð ৡ Ô

Â

ð Ô

ৰ Л **show dot1x** ৡ 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 ৡ Ô

ৡ	
show dot1x	802.1x

41.2.5 dot1x timeout tx-period

ʌ˘ ৡ ˘

Â ৡ no ѝ Â

dot1x timeout tx-period *seconds*

no dot1x timeout tx-period

ð Ô

seconds' Â 0 65535 Â

ð Ô

3 Â

ð ৡ Ô

Â

ð Ô

ɻ Л **show dot1x** ৡ 802.1x Â

ð Ô

Ю ѝ 10s'

```
Ruijie# configure terminal
Ruijie(config)# dot1x timeout tx-period 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:      10 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 ৡ Ô

ৡ	
show dot1x	802.1x

41.3 dot1x

ЛЪЮ ৡ

- **dot1x re-authentication**
- **dot1x reauth-max**

41.3.1 dot1x re-authentication

ৡ Â ৡ no
Â

[**no**] **dot1x re-authentication**

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ৡ˘ Л˘ Л
Â ⅃Л **show dot1x** ৡ 802.1x Â

ð Ô

Ю ℸ '

```
Ruijie# configure terminal
Ruijie(config)# dot1x re-authentication
Ruijie(config)# end
Ruijie# show dot1x
802.1X Status:       Enabled
Authentication Mode:  EAP-MD5
```

```
Authed User Number:   0
Re-authen Enabled:    Enabled
Re-authen Period:     1000 sec
Quiet Timer Period:   1000 sec
Tx Timer Period:      10 sec
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

41.3.2 dot1x reauth-max

ৡ Â ৡ **no**
Â

dot1x reauth-max *count*

no dot1x reauth-max

ð Ô

count Â

ð Ô

ѝ 3

ð ৡ Ô

Â

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ৡ˘ ⅃Ⅱ Â⅃Ⅱ
show dot1x ৡ 802.1x Â

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```
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

41.4 dot1x

৶ ЛЪЮ

- **dot1x probe-timer**
- **dot1x client-probe enable**

41.4.1 dot1x probe-timer

.

dot1x probe-timer{**interval** | **alive**}*interval*

no dot1x probe-timer

ð Ô

no'

interval hello

alive'

interval

Hello ӄ 20

ӄ 250

ð ৡ Ô

Â

ð Ô

˘ ˧ Л᧙ **show dot1x** ৡ 802.1x

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ð Ô

hello ӄ 30 , ӄ 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 ৡ Ô

ৡ	
Show dot1x probe-timer	

41.4.2 dot1x client-probe enable

Ⅶ

[**no**] **dot1x client-probe enable**

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Ⅶ

ð Ô

Ruijie# **configure terminal**
Ruijie(config)# **dot1x client-probe enable**
Ruijie(config)# **end**
Ruijie# **show dot1x**
802.1X Status: Enabled
Authentication Mode: EAP-MD5
Authed User Number: 0
Re-authen Enabled: Enabled
Re-authen Period: 1000 sec
Quiet Timer Period: 1000 sec
Tx Timer Period: 10 sec
Supplicant Timeout: 10 sec
Server Timeout: 10 sec
Re-authen Max: 5 times
Maximum Request: 3 times
Filter Non-RG Supp: Disabled
Client Oline Probe: Enabled
Eapol Tag Enable: Disabled
Authorization Mode: Group Server

¾	
show dot1x	dot1x

41.5 dot1x

dot1x

- **dot1x authentication**
- **dot1x auth-address-table**
- **dot1x auth-mode**
- **dot1x default**
- **dot1x dynamic-vlan enable**
- **dot1x guest-vlan enable**
- **dot1x eapol-tag**
- **dot1x max-req**
- **dot1x private-supplicant-only**
- **dot1x port-control auto**
- **dot1x port-control-mode**
- **dot1x stationarity enable**

41.5.1 dot1x authentication

AAA AAA
no

dot1x authentication {**default** | *list-name*}

no dot1x authentication {**default** | *list-name*}

default

list-name

AAA AAA

AAA dot1x

group radius

```
Ruijie# configure terminal
Ruijie(config)# aaa new-model
Ruijie(config)# aaa authentication dot1x default group
radius
Ruijie(config)# interface fastEthernet0/1
Ruijie(config-if)# dot1x authentication default
Ruijie(config-if)# end
Ruijie#
```

aaa new-model	AAA
aaa authentication dot1x	

41.5.2 dot1x auth-address-table

802.1X
no

dot1x auth-address-table address *mac-addr* **interface** *interface*

no dot1x auth-address-table address *mac-addr* **interface** *interface*

ð Ô

mac-addr' ┘ Â

Interface' /ı 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

41.5.3 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

ˆ Ê **show dot1x** ¾ Â

Ю VLAN '

```
Ruijie# configure terminal
Ruijie(config)# dot1x auth-fail max-attemp 5
Ruijie(config)# end
Ruijie#write
```

¾

¾	
show dot1x	802.1x Â

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¾ Ë

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-	-

41.5.4 dot1x auth-fail vlan

802.1x vlan Â

dot1x auth-fail vlan *vid*

no dot1x auth-fail vlan

vid	vlan vid

vlan

¾ Â

ˆ Ê **show dot1x interface** ¾ 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

/ſ
-

ৡ	
-	-

41.5.5 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

ɹ 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

¾	
show dot1x	802.1x Â

41.5.6 dot1x default

802.1x ¦ Â

dot1x default

ð Ô

¾ Â

ð Ô

ð ¾ Ô

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ð Ô

┘Л **show dot1x** ¾ 802.1x Â

ð Ô

Ю 802.1x '

```
Ruijie# configure terminal
Ruijie(config)# dot1x default
Ruijie(config)# end
Ruijie# end
```

ð ¾Ô

¾	
show dot1x	802.1x Â

41.5.7 dot1x dynamic-vlan enable

╟ vlan Â ¾ **no** ┘Л

Â

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ý

ð ֽ Ô

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ð Ô

ֿ Л Ъ **show dot1x dynamic-vlan** ֽ 802.1x Â

ð Ô

Ю 802.1x ╟ vlan '

```
Ruijie# configure terminal
Ruijie(config)# interface fastEthernet 0/1
Ruijie(config-if)# dot1x dynamic-vlan enable
Ruijie(config-if)# end
Ruijie#
```

ð ֽ Ô

ֽ	
show dot1x	802.1x Â

৭ vlan Â

3. ৸ Л৬ **show running-config** ৡ 802.1x Â

ð Ô

Ю 802.1x guest vlan '

```
Ruijie# configure terminal
Ruijie(config)# interface fastEthernet 0/1
Ruijie(config-if)# dot1x guest-vlan 10
Ruijie(config)# end
Ruijie#
```

ð ৡ Ô

ৡ	
show running-config	802.1x Â

41.5.9 dot1x eapol-tag

EAPOL TAG ৭ Â

dot1x eapol-tag

no dot1x eapol-tag

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৸ Л৬ **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

३	

dot1x mac-auth-bypass timeout-activity *value*

no dot1x mac-auth-bypass timeout-activity

value	˘ Л∪ ѝ Æ, 1-65535

˘ a

ৡ Â

ㅓЛ∪ **show run** ৡ 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
```

ৡ	
show dot1x port-control interface	802.1x Â

ㅓ

ㅓ	
-	-

41.5.12 dot1x mac-auth-bypass violation

802.1x MAC Â

dot1x mac-auth-bypass violation

no dot1x mac-auth-bypass violation

v	

٪ Â

ٔ Ո **show run** ٪ 802.1x Â

Ю 802.1x MAC '

```
Ruijie# configure terminal
Ruijie(config)# interface fa 0/1
Ruijie(config-if)# dot1x mac-auth-bypass violation
Ruijie(config-if)# end
Ruijie#write
```

٪

٪	
show dot1x port-control interface	802.1x Â

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٪ ٔ

ٔ	
-	-

41.5.13 dot1x max-req

DOT1X Ь ˘ DOT1X
Ь ˘ DOT1X "Ą Ь Â ٪
Ь Â ٪ **no**
Â

dot1x max-req *count*

no dot1x ma87x-req

ð Ô

count Â

ð Ô

й 3 Â

ð ٪ Ô

Â

ð Ô

ٔ Ո **show dot1x** ٪ 802.1x Â

ð Ô

Ю 802.1x 7 '

```
Ruijie# configure terminal
Ruijie(config)# dot1x max-req 7
Ruijie(config)# end
Ruijie#
```

ð ٦ Ô

٦	
show dot1x	802.1x Â

41.5.14 dot1x private-supplicant-only

˘ ˘ **no**

Â

dot1x private-supplicant-only

no dot1x private-supplicant-only

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41.5.15 dot1x port-control auto

ˇ ╗ Â ৡ **no**

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

ù mac-based 8

ð ٪ Ô

Â

ð Ô

٫Л **show dot1x port-control** ٪ 802.1x Â

single-host 802.1x 8˘ **show dot1x port-control** Э ù port-based **show running-config** ù **dot1x port-control-mode port-based single-host** Â

single-host ˘ ╠ default-user-limit single-host Â single-host ˘ Ю default-user-limit single-host ˘ 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

ٹ	
show dot1x port-control	802.1x Â
Show running-config	Â

41.5.17 dot1x stationarity enable

802.1x ⁸ Ю˘ Ю˘ ╟ ┘Л
˘ Ю˘ й a ÿ 802.1X è
˘ ┘Л ЛЮ ٹ Â

dot1x stationarity enable

no dot1x stationarity enable

ð Ô

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Ю 802.1x б '

```
Ruijie# configure terminal
Ruijie(config)# dot1x stationarity enable
Ruijie(config)# end
Ruijie#
```

ð ٹ Ô

41.5.18 dot1x redirect url

˘ 802.1x ╖ ˆ ~ ˘

ʃ url url Â no ৡ ɲ

url'

dot1x redirect url [url-string]

[no] dot1x redirect url

url-string	URL

ৡ

1' ' ruijie.net/web'

```
Ruijie(config)# dot1x redirect url http://ruijie.net/web
```

ৡ	
dot1x redirect for special tcp-destination port	ỳ ˘ ip ỳ ip web
dot1x redirect time-out	
dot1x redirect num for special source-ip	ɲ
show dot1x	dot1x

ʃ

ʃ	
-	-

41.5.19 dot1x redirect for special tcp-destination port

ỳ ˘ ip ỳ ip web ˘

80 à 8080 ˘ Ạ 16 TCP ʃˇ no dot1x redirect for special tcp-destination port

ʃˇ ʃ ╗ port_mum ʃ'

[no] dot1x redirect for special tcp-destination port port num

port num	TCP /I

tcp

٣

1' ٭ 5 '

```
Ruijie(config)# dot1x redirect time-out 5
```

٣	
dot1x redirect url	٭ ˘ ip ٭ ip web
dot1x redirect for special tcp-destination port	
dot1x redirect num for special source-ip	٫
show dot1x	dot1x

٫

٣ ٫	٨	
	-	-

41.5.21 dot1x redirect num for special source-ip

٫ ˘ 1 ˘ ٫ ٭ 1-10 Â

no ٫ ٨ ٣ '

dot1x redirect num for special source-ip num

no dot1x redirect num for special source-ip

num	

1

٣

1' ѝ 3'

```
Ruijie(config)# dot1x redirect num for special source-ip 3
```

३	
dot1x redirect url	
dot1x redirect for special tcp-destination port	ѝ ˘ ip ѝ ip

ৡ Â

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Ю '

```
Ruijie# show dot1x
802.1X Status:       Enabled
Authentication Mode:  EAP-MD5
Authed User Number:   0
Re-authen Enabled:    Disabled
Re-authen Period:     3600 sec
Quiet Timer Period:   10 sec
Tx Timer Period:      3 sec
Supplicant Timeout:   3 sec
Server Timeout:       5 sec
Re-authen Max:        3 times
Maximum Request:      3 times
Filter Non-RG Supp:   Disabled
Client Oline Probe:   Disabled
Eapol Tag Enable:     Disabled
Authorization Mode:   Group Server
Ruijie#
```

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	Ł Â
dot1x timeout supp-timeout	Â
dot1x timeout tx-period	Â

41.6.2 show dot1x auth-address-table

¾ 802.1X Â

show dot1x auth-address-table[*addressmac-addr*][*interface interface*]

ð Ô

mac-addr ¬

interface /¹

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Ю '

```
Ruijie# show dot1x auth-address-table
interface:g3/1
-----------------------------------
mac addr: 00D0.F800.0001
Ruijie#
```

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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	Ⅎ Â
dot1x timeout supp-timeout	Â
dot1x timeout tx-period	˘ Â

41.6.3 show dot1x auto-req

ÿ ╟ 802.1x Â

show dot1x auto-req

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```
Ruijie# show dot1x auto-req
Auto-Req: Disabled
User-Detect : Enabled
Packet-Num  : 0
Req-Interval: 30 Seconds
Ruijie#
```

ð ৡ Ô

ৡ	

802.1X ३

dot1x port-control auto	╗ Â

dot1x reauth-max

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	Â
dot1x timeout tx-period	˘ Â

41.6.5 show dot1x max-req

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show dot1x max-req

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```
Ruijie# show dot1x max-req
max-req: 2 times
Ruijie#
```

ð ¾ Ô

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	Â
dot1x timeout tx-period	Â

41.6.6 show dot1x port-control

б Â

show dot1x port-control [**interface** *interface*]

ð Ô

interface'

ð Ô

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Ю '

```
Ruijie# show dot1x port-control
interface dyn-user static-user max-user qos
```

```
ctrl-mode status
--------- -------- ---------- -------- ------- ------
Gi0/1      0          1             6000      dscp: 0
mac-base Authed
Ruijie#
```

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	Â
dot1x timeout tx-period	˘ Â

41.6.7 show dot1x probe-timer

show dot1x probe-timer

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```
Ruijie# show dot1x reauth-max
reauth-max: 2 times
Ruijie#
```

ð ¾ Ô

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	Â
dot1x timeout tx-period	˘ Â

41.6.10 show dot1x summary

¾ 802.1X

show dot1x summary

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Ю '

```
Ruijie# show dot1x summary
ID    MAC       Interface VLAN Auth-State
Backend-State Port-Status Type
---------------- -------------- --------------
1 00d0f8000000 Gi0/1       1  Authenticated Idle
Authed     Static
Ruijie#
```

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	Â
dot1x timeout tx-period	˘ Â

41.6.11 show dot1x user id

¾ 802.1X

show dot1x user id

ð Ô

id show summary id

dot1x timeout quiet-period	ʃ Â
dot1x timeout re-authperiod	Â
dot1x timeout server-timeout	Ł Â
dot1x timeout supp-timeout	Â
dot1x timeout tx-period	˘ Â

41.6.12 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
u5luppout servout quiet-period	╘ Â

42 AAA

42.1

- **aaa authentication dot1x**
- **aaa authentication enable**
- **aaa authentication login**
- **aaa authentication ppp**
- **login authentication**

42.1.1 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** | *list-name*}

ð Ô

default ' ˘ ˄ ЊЖ и 802.1X Â

list-name ' ЊЖ 802.1X ˘ ˩ Л Â

method ' Ю ˘ 4 '

local	˄
none	a
group	Ь ˘ RADIUS Ь

ð Ô

ð ¾ Ô

Â

ð Ô

AAA 802.1X Ê AAA 802.1X
Â **aaa authentication dot1x** ¾
Ë 802.1X Â

Ë Ì Í Â

ð Ô

Ю Ин Í и rds_d1x AAA 802.1X Â
"I RADIUS Ê Ì RADIUS
Ê Ë Ì Â

```
Ruijie(config)# aaa authentication dot1x rds_d1x group
radius local
```

ð ¾ Ô

¾	
aaa new-model	AAA Ê
dot1x authentication	802.1X Э
username	Ин

42.1.2 aaa authentication enable

AAA Enable Ì ¾ **aaa authentication enable** Enable Â ¾ no
Â

aaa authentication enable default *method1* [*method2*...]

no aaa authentication enable default

ð Ô

default ' Ì Í Ин и Enable
Â Enable Ì
Â

method ' Ю Ì 4 '

local	Í
none	a
group	Ê Ì RADIUS TACACS+ Ê

ð Ô

ð ¾ Ô

Â

ð Ô

AAA Enable ˘ AAA Enable

Â **aaa authentication enable** ¾

Enable Â

˘ ˇ ˇ Â

Enable ˇ˘

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

42.1.4 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 ЊЖ й PPP
Â

list-name ' ЊЖ PPP ˘ ┤ 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 ┤
PPP Â

┤ ˘ Л Â

ð Ô

Ю ЊЖ Л й rds_ppp AAA PPP Â
"I RADIUS Ь ˘ RADIUS Ь
┤ ˘ Â

```
Ruijie(config)# aaa authentication ppp rds_ppp group
radius local
```

ð ¾ Ô

42.1.5 login authentication

Э Loginˆ ~ ╖ ˘
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 ˘ ы ¾ Â
Ю ˘ ˘ Э Login
a ˘ Ю Login Â

ð Ô

Ю Ю ы ь list-1 AAA Login Â
Â ы 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

42.2

- **aaa authorization commands**
- **aaa authorization config-commands**
- **aaa authorization console**
- **aaa authorization exec**
- **aaa authorization network**
- **authorization commands**
- **authorization exec**

42.2.1 aaa authorization commands

NAS CLI Э ˘ AAA ৡ ╖
ৡ ˘ έ ৡ Â
ৡ **aaa authorization commands** Â ৡ no

˘ ⅋ ˩

˘ Э˘ ⅋ AAA ⅋ ⅋

˘ ⅋ a ⅋˘ ⅋

Â

˘ ⅋ ⅋ ⅋

14 Л Э ˘ ˩ ⅋ ˆ ˘ ⅋ 14

˜ Â

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

42.2.3 aaa authorization console

AAA ⁸ ⅄ ˇ ৡ ˇ
ৡ **aaa authorization console** Â ৡ no AAA
⁸ ⅄ ৡ ╖ Â

aaa authorization console

no aaa authorization console

ð Ô

ৡ Â

ð Ô

a ⁸ ⅄ ৡ Â

ð ৡ Ô

Â

ð Ô

Ꮙ᭫ ⁸ ⅄ è ˇ ⅃ Л৬ ⁸
⅄ ˇ ৡ Â ⁸ ⅄ ৡ ╖
ˇ ⁸ ⅄ ৡ a Â

ð Ô

Ю ⁸ ⅄ ৡ ╖ '

```
Ruijie(config)# aaa authorization console
```

ð ৡ Ô

३	

ৰ Ô

Ruijie(config)# **aaa authorization network default group radius**

ৰ ঽ Ô

ঽ	
aaa new-model	

¦ ˘ ╟ 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 ¦

42.2.7 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

level ' ʒ ˘ 0~15˝ ᾱ ʒ ˘
Â

default ' ˘ Л Ҥ и ʒ Â

list-name ' Ҥ ʒ ˘ ˩ Л Ա Â

method ' Ю ˘ 4 '

¾	
aaa new-model	AAA ╘
aaa authentication	ЊЖ AAA
accounting commands	Э Exec

42.3.3 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 ৡ Ô

aaa new-model AAA

42.3.5 aaa accounting update periodic

aaa accounting update periodic ¯ ¯ ¯ 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 ¯ Ô

Â

ð Ô

AAA Ь˘ a Â AAA Ь˘ ¯ Â

ð Ô

Ю 1¶ Â

```
Ruijie(config)# aaa new-model
Ruijie(config)# aaa accounting update
Ruijie(config)# aaa accounting update periodic 1
```

ð ¯ Ô

¯	
aaa new-model	AAA Ь
aaa accounting network	Њ

42.3.6 accounting commands

¯ Э˘ ¯ **accounting commands** Â ¯ no ѵ Э ¯ ¶ Â

accounting commands *level* {**default** | *list-name*}

no accounting commands *level*

ð Ô

level ' ʒ ˘ 0~15¯ ᾱ ʒ
Â

default ' ˘ ʒ Â

list-name ' ⊮ ʒ Â

ð Ô

╖

ð ʒ Ô

Â

ð Ô

ʒ ˘ ╟ Э Â Э
ʒ ˘ ↓ ʒ Â
⊮ ˘ ˘ Э ʒ a
˘ ⊮ ʒ Â

ð Ô

list-name ' Exec Â

ð Ô

¶

ð ¦ Ô

Â

ð Ô

Exec ˘ ╟ Э Â
Э Exec ˘ ¦ Â
˘ ˘ Э Exec
a ˘ Exec Â

ð Ô

Ю ¦ й exec-1 Exec ˘ RADIUS й
Ł ˘ Ł none Â ¦ VTY
0 – 4 Э'

```
Ruijie(config)# aaa accounting exec exec-1 group radius
none
Ruijie(config)# line vty 0 4
Ruijie(config-line)# accounting exec exec-1
```

ð ¦ Ô

¦	
aaa new-model	AAA Ł
aaa accounting commands	AAA Exec

42.4 AAA

- **aaa group server**
- **ip vrf forwarding**
- **server**
- **show aaa group**

42.4.1 aaa group server

AAA Ł Â ¦ no Ł Â

aaa group server {**radius** | **tacacs+**} *name*

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 ֽ Ô

ֽ	
aaa group server	aaa ┗
show aaa group	aaa ┗

```
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
```

```
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

42.5 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**

42.5.1 aaa local authentication attempts

login

aaa local authentication attempts *max-attempts*

ð Ô

max-attempts' ˘ ¼ 1~2147483647 Â

ð Ô

ù 3

ð ¾ Ô

Â

ð Ô

¾ Login

ð Ô

Ю '

```
Ruijie# configure terminal
```

```
Ruijie(config)# aaa local authentication attempts 6
```

ð ¾Ô

¾	
show running-config	
show aaa lockout	login

42.5.2 aaa local authentication lockout-time

login ˘

aaa local authentication lockout-time *lockout-time*

ð Ô

lockout-time' ˆ Æ' ˜˜ ы 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

42.5.3 aaa new-model

AAA ┗╖ ˘ ¾ **aaa new-model**

AAA Â ¦ **no** AAA ˩ Â

aaa new-model

no aaa new-model

ð Ô

¦ Â

ð Ô

AAA ˩

ð ¦ Ô

Â

ð Ô

¦ AAA ¦˘ AAA ˩˘

aaa new-model AAA ˩ Â AAA˘ AAA

¦ a ˩ Â

ð Ô

ÞO AAA ˩ Â

```
Ruijie(config)# aaa new-model
```

ð ¦ Ô

¦	
aaa authentication	Þ
aaa authorization	Þ
aaa accounting	Þ

42.5.4 clear aaa local user lockou**t**

clear aaa local user lockout {**all** | **user-name** <*word*>}

ð Ô

<*word*>' ID

ð Ô

ð ¦ Ô

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

42.5.5 debug aaa

AAA ⊾ Â ৡ **no** Â

debug aaa event

no debug aaa event

ð Ô

Â

ð ৡ Ô

EXEC Â

42.5.6 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

42.5.7 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

Ю radius ÿ fastEthernet 0/0 ↓ ip й
radius '

```
Ruijie(config)#
```

ð ¾Ô

¾	
radius-server host	ÞÆ RADIUS Ł

43.1.3 radius-server host

RADIUS Ł ÿ ˘ ¾ **radius-server** Â ¾ **no** RADIUS Ł ÿ 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 Ł ÿ IP Â

auth-port: RADIUS UDP

port-number: RADIUS UDP /ˇ ˙ 0˝ ÿ a Â

acct-port: Radius UDP

port-number: RADIUS UDP /ˇ ˙ 0˝ ÿ a Â

ð Ô

RADIUS ÿ Â

ð ¾ Ô

Â

ð Ô

˙ RADIUS AAA Ł˘ ÞÆ RADIUS Ł Â ¬ Л **radius-server** ¾ ÞÆ RADIUS Ł Â

ð Ô

Ю ÞÆ RADIUS Ł ÿ '

```
Ruijie(config)# radius-server host 192.168.12.1
```

ð ¾Ô

¾	
aaa authentication	ÞÆ AAA

radius-server key	ⅈ RADIUS ┗ ٪
radius-server retransmit	ⅈ RADIUS
radius-server timeout	ⅈ RADIUS

43.1.4 radius-server key

ⅈ ┗ ^ ~ б RADIUS ┗
٪˘ ٪ **radius-server key** Â ٪ no
↓ ٪ Â

radius-server key [**0|7**] *text-string*

no radius-server key

ð Ô

text-string ٪

ð Ô

٪ Â

ð ٪ Ô

Â

ð Ô

٪ RADIUS ┗ Â и
RADIUS ┗ ˘ RADIUS ┗
Э ⅈ ↓ ٪ Â

ð Ô

Ю ⅈ RADIUS ┗ ٪ и aaa'

```
Ruijie(config)# radius-server key aaa
```

ð ٪ Ô

٪	
radius-server host	ⅈ RADIUS ┗ ў
radius-server retransmit	ⅈ RADIUS
radius-server timeout	ⅈ RADIUS

ý RADIUS ¬ ¬ ¯

¯ **radius-server retransmit** Â ¯ **no**

Â

radius-server retransmit *retries*

no radius-server retransmit

ð Ô

retries' RADIUS Â

ð Ô

ý 3Â

ð ¯ Ô

Â

ð Ô

AAA Ю ¬

¬ Â ¬ ¬

RADIUS ˘ Â

ð Ô

Ю ý 4'

```
Ruijie(config)# radius-server retransmit 4
```

ð ¯Ô

¯	
radius-server host	HRADIUS ¬ ÿ
radius-server key	HR RADIUS ¯
radius-server timeout	HR RADIUS

43.1.6 radius-server timeout

RADIUS ¬ ˘

¯ **radius-server timeout** Â ¯ **no** ˘ Â

radius-server timeout *seconds*

no radius-server timeout

ð Ô

seconds' ^ Æ ý ~ Â ¬ ý 1-1000 Â

ð Ô

5 فو ئو ,m' ؟

```
Ruijie(config)# radius-server deadtime 10
```

ð ¾Ô

¾	
radius-server host	ÌRADIUS Ë ÿ
radius-server retransmit	ÌRADIUS
radius-server key	ÌRADIUS ¾
radius-server timeout	ÌRADIUS

43.1.8 radius attribute

radius attribute{*id* **| down-rate-limit | dscp | mac-limit | up-rate-limit**} **vendor-type** *type*

no radius attribute {*id* **| down-rate-limit | dscp | mac-limit | up-rate-limit**} **vendor-type**

ð Ô

id ' ¶ id <1-255>

type ' type

ð Ô

id	¶	type
1	max down-rate	1
2	qos	2
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	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
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 ¾ Ô

Â

ð Ô

¾ Â

ð Ô

Ю max up-rate Ня и 211'

```
Ruijie(config)# radius attribute 16 vendor-type 211
```

ð ¾ Ô

¾	
radius set qos cos	radius Ю qos и cos

43.1.9 radius set qos cos

radius Ю qos и cos

radius set qos cos

no radius set qos cos

ð Ô

ð Ô

qos и dscp

ð ¾ Ô

Â

ð Ô

ֽ˘ ˩Л Ю qos ѝ cos ˘ ѝ dscp

ð Ô

Ю '

```
Ruijie(config)# radius set qos cos
```

ð ֽ Ô

ֽ	
radius vendor-specific extend	Radius ѝ a ѫ id

43.1.10 radius vendor-specific extend

ѝ a ѫ id Â

radius vendor-specific extend

no radius vendor-specific extend

ð Ô

ð Ô

id

ð ֽ Ô

Â

ð Ô

ֽ ˩ id Â

ð Ô

Ю '

```
Ruijie(config)# radius vendor-specific extend
```

ð ֽ Ô

ֽ	
radius attribute	Л
radius set	qos cos

43.2 RADIUS

radius-server host	ÎÆRADIUS ¸ ÿ
radius-server retransmit	ÎÆ RADIUS
radius-server key	ÎÆ RADIUS ¯
radius-server timeout	ÎÆ RADIUS

43.2.4 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	

44 TACACS+

44.1 TACACS+

TACACS+ ЛЬЮ ٣'

- **aaa group server tacacs+**
- **server**(**TACACS+**)
- **ip vrf forwarding**(**TACACS+**)
- **ip tacacs source-interface**
- **tacacs-server host**
- **tacacs-server key**
- **tacacs-server timeout**

44.1.1 aaa group server tacacs+

٣ TACACS+ Ь ˘ a ٫ TACACS+ Ь ˀ a ٫ Â

aaa group server tacacs+ *group-name*

no aaa group server tacacs+ *group-name*

ð Ô

group-name' TACACS+ Ь ٫

ð Ô

TACACS+ Ь Â

ð ٣ Ô

Â

ð Ô

TACACS+ Ь ˀ ˘ à à ٫Лъ a ٫ Ь Â

ð Ô

Ю ٫ й tac1 TACACS+ Ь ˘ з 1.1.1.1 TACACS+ Ь '

```
Ruijie(config)# aaa group server tacacs+ tac1
Ruijie(config-gs-tacacs+)#server 1.1.1.1
```

ð ¾Ô

¾	
server	TACACS+ ¦ server
ip vrf forwarding	TACACS+ ¦ VRF ¿

44.1.2 server(TACACS+)

¾ TACACS+ ¦ ¦ Â

server *ip-address*

no server *ip-address*

ð Ô

ip-address' TACACS+ ¦ ¦

ð Ô

ð ¾ Ô

TACACS+ ¦ Â

ð Ô

¾ ˘ ¾ **aaa group server tacacs+** TACACS+ Â

TACACS+ ¦ ¦ ˘ Ю˘ **tacacs-server host** ¾ ¦ Â

¦ TACACS+ ¦ ˘ ¦ ˘ Ю ¦ Â

ð Ô

Ю ¿ ŷ tac1 TACACS+ ¦ ˘ з 1.1.1.1 TACACS+ ¦ '

```
Ruijie(config)# aaa group server tacacs+ tac1
Ruijie(config-gs-tacacs+)# server 1.1.1.1
```

ð ¾Ô

¾	
aaa group server tacacs+	TACACS+ ¦
ip vrf forwarding	TACACS+ ¦ VRF ¿

44.1.3 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

ϰ TACACS+ ┺ vrf ⅄ Â

ð Ô

Ю ϰ TACACS+ ┺ VRF ⅄ ϰ 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

44.1.4 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 ˝ Ô

Â

ð Ô

й TACACS+ Ь Э nas ˘ Л Ц
˝ TACACS+ Â ˝ ip
й TACACS+ ˘ ˝ Ь Â

ð Ô

Ю TACACS+ ÿ fastEthernet 0/0 Л ip
й TACACS+ '

```
Ruijie(config)# ip tacacs source-interface
fastEthernet 0/0
```

ð ˝ Ô

˝	
tacacs-server host	Њ TACACS+ Ь
ip address	ip

44.1.5 tacacs-server host

˝ TACACS+ Ь ў IP Â

tacacs-server host *ip-address* [**port** *integer*] [**timout** integer] [**key** [**0 | 7**]*string*]

no tacacs-server host *ip-address*

ð Ô

Ip-address ' TACACS+ Ь ў IP Â
port *integer* ' TACACS+ TCP
timeout *integer* ' TACACS+ ў Â
key *string* ' TACACS+ client б Ь Â
0 | 7 ' ˝ ╗ ˘ 0 ╗ ˘ 7 ╗ Â

ð Ô

TACACS+ ў Â

ð ˝ Ô

Â

ð Ô

ù TACACS+ AAA ¬ ¼ TACACS+ ¬
Â ¬Ú **tacacs-server** ¢ ¼ TACACS+ ¬
Â

ð Ô

Ю ¼ TACACS+ ¬ ÿ '

```
Ruijie(config)# tacacs-server host 192.168.12.1
```

ð ¢ Ô

¢	
aaa authentication	¼ AAA
tacacs-server key	¼ TACACS+ ¬ ¢
tacacs-server timeout	¼ TACACS+ ¬

44.1.6 tacas-server key

¢ TACACS+ Â

tacacs-server key [**0 | 7**] *string*

no tacacs-server key

ð Ô

string ¢

0 | **7** ¢ ¶ ˘ 0 ¶ ˘ 7 ¶ Â

ð Ô

¢ Â

ð ¢ Ô

Â

ð Ô

¢ TACACS+ ¬ Âù
TACACS+ ¬ ˘ TACACS+
¬ Э ¼ ¿ ¢ Â ù ¬ a ¿
˘ host ¢ key ˘ ¬Ú
key ¬ key Â

ð Ô

Ю ¼ TACACS+ ¬ ¢ ù aaaˈ

```
Ruijie(config)#tacacs-server key aaa
```

ð ¯Ô

¯	
tacacs-server host	ЊЖ TACACS+ Ь ў
tacacs-server timeout	ЊЖ TACACS+

44.1.7 tacacs-server timeout

¯ б TACACS+ Ь ˘ Ь Â

tacacs-server timeout *seconds*

no tacacs-server timeout

ð Ô

seconds' ^ Æ й ~ Â ┘ й 1-1000 Â

ð Ô

5

ð ¯ Ô

Â

ð Ô

¯ Â й Ь
a ┘ ˘ host ¯ timeout ˘ ┘Л
timeout Ь timeout Â

ð Ô

Ю ЊЖ й 10 '

```
Ruijie(config)# tacacs-server timeout 10
```

ð ¯Ô

¯	
tacacs-server host	ЊЖ TACACS+ Ь ў
tacacs-server key	ЊЖ TACACS+ ¯

44.2 TACACS+

- **debug tacacs+**
- **show tacacs**

44.2.1 debug tacacs+

TACACS+ Â ¾ no TACACS+ Â

debug tacacs+

no debug tacacs+

ð Ô

Â

ð ¾ Ô

EXEC Â

44.2.2 show tacacs

TACACS+ ¸ Â

show tacacs

ð Ô

Â

ð Ô

ð ¾ Ô

Â

ð Ô

¾ TACACS+ ¸ Â

ð Ô

```
Ruijie# show tacacs
Tacacs+ Server : 172.19.192.80/49
Socket Opens: 0
Socket Closes: 0
Total Packets Sent: 0
Total Packets Recv: 0
Reference Count: 0
```

ð ¾ Ô

¾	
tacacs-server host	¼ TACACS+ ¸ ¸ ÿ

45 SSH

45.1 SSH

SSH ЛЪЮ ϧ'

- **crypto key generate**
- **crypto key zeroize**
- **ip ssh version**
- **ip ssh time-out**
- **ip ssh authentication-retries**

45.1.1 crypto key generate

Ь Ὼ ˘ Ю˘ ϧ'

crypto key generate {**rsa | dsa**}

ð Ô

rsa	RSA
dsa	DSA

ð Ô

Ю SSH Server Ὼ Â

ð ϧ Ô

ð Ô

SSH Server Ь ˘ ϧ SSH Ь Ὼ
Â ⅄ **enable service ssh-server** ϧ˘ SSH Server ╖
ÂSSH 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	SSH Server Â
crypto key zeroize {**rsa	dsa**}	DSA б RSA ˘ SSH Server ╖ Â

ð Ô

˚ RGOS10.1 Лъ Э

45.1.2 crypto key zeroize

SSH Ł Ώ ˘ Ю˘ ¾'

crypto key zeroize {**rsa** | **dsa**}

ð Ô

rsa	RSA
dsa	DSA

```
Ruijie# configure terminal
Ruijie(config)# crypto key zeroize rsa
```

ð ٪ Ô

٪	
show ip ssh	SSH Server Â
crypto key generate {**rsa**|**dsa**}	DSA б RSA Â

ð Ô

˚ RGOS10.1 Л Э

45.1.3 ip ssh version

SSH server Â ٪ no ѝ Â

ip ssh version {**1** | **2**}

no ip ssh version

ð Ô

1	SSH Server SSH1
2	SSH Server SSH2

ð Ô

Ю SSH 1 2 Â Л˘ ˩ SSH Â **no ip ssh version** ٪ ≠ ˩ Л ѝ Â

ð ٪ Ô

ð Ô

٪ ⁸ SSH Server SSH Â Ю˘ SSH Server SSH1 б SSH2˝ SSH 1 SSH 2 ˩ Л Â 1 2˝ SSH Â **show ip ssh** ٪ SSH Server Â

ð Ô

2˝

```
Ruijie# configure terminal
Ruijie(config)# ip ssh version 2
```

ð ٪ Ô

٪	
show ip ssh	SSH Server Â

ð Ô

˚ RGOS10.1 Лυ Э

45.1.4 ip ssh time-out

SSH Server Â ٪ **no**
ù Â

ip ssh time-out *time*

no ip ssh time-out

ð Ô

time	Â

ð Ô

Ю˝ ù 120s Â Л˘ **no ip ssh time-out** ٪˘ ù Â

ð ٪ Ô

ð Ô

٪ SSH Server Â ÿ ˩
˘ 120s ╖ ˘ ù Â
show ip ssh ٪ SSH server Â

ð Ô

ù 100s˙

```
Ruijie# configure terminal
Ruijie(config)# ip ssh time-out 100
```

ð ٪ Ô

٪	

show ip ssh	ssh-server Â

ð Ô

˚ RGOS10.1 Л Э

45.1.5 ip ssh authentication-retries

SSH Server Â ৡ no
ѝ Â

ip ssh authentication-retries *retry times*

no ip ssh authentication-retries

ð Ô

retry times	Â

ð Ô

Ю ѝ 3 Â Л˘ **no ip ssh authentication-retries** ৡ ≠ ┘Л Л ѝ Â

ð ৡ Ô

ð Ô

ৡ SSH Server Â SSH Server
˘ Ÿ ╖˘ ѝ Â **show ip ssh** ৡ SSH Server Â

ð Ô

ѝ 2˚

```
Ruijie# configure terminal
Ruijie(config)# ip ssh ssh authentication-retries 2
```

ð ৡ Ô

ৡ	
show ip ssh	SSH Server Â

ð Ô

˚ RGOS10.1 Л Э

45.2 SSH

SSH ЛЬЮ ৡ'

- **show ip ssh**
- **show ssh**
- **show crypto key mypubkey**
- **disconnect ssh**

45.2.1 show ip ssh

SSH Server Â

show ip ssh

ð Ô

ð Ô

ð ৡ Ô

ð Ô

SSH Server Â ' à SSH Server à à Â

' SSH ˘ Ł ˘ Ÿ SSH ù a ˩ Â

ð Ô

```
Ruijie# show ip ssh
```

ð ৡ Ô

ৡ	
Ip ssh version {**1** | **2**}	SSH Server Â
ip ssh time-out time	SSH Server Â
Ip ssh authentication-retries retry times	SSH Server Â

ð Ô

˚ RGOS10.1 Л Э

45.2.2 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

45.2.3 show crypto key mypubkey

SSH Server Ὼ Ὼ ⍞ Â

show crypto key mypubkey {***rsa*|*dsa***}

ð Ô

rsa	RSA Ὼ ⍞
dsa	DSA Ὼ ⍞

ð Ô

ð ৡ Ô

ð Ô

SSH Server Ὼ Ὼ ᾽ Â '
à ɹ à Ὼ ᾽ Â

ð Ô

```
Ruijie# show crypto key mypubkey rsa
```

ð ৡ Ô

ৡ	
crypto key generate {**rsa	dsa**}	DSA б RSA Â

ð Ô

˚ RGOS10.1 Л Э

45.2.4 disconnect ssh

SSH Â

disconnect ssh [**vty**] *session-id*

ð Ô

session-id	SSH Л Â

ð Ô

ð ৡ Ô

ð Ô

SSH Л˘ SSH Â
VTY Л˘ SSH Â SSH
Â

ð Ô

```
Ruijie# disconnect ssh 1
Ruijie# disconnect ssh vty 1
```

ð ¾ Ô

¾	
show ssh	SSH Â
Clear line vty *line_number*	VTY Â

ð Ô

˚ RGOS10.1 Л Э

46 CPU

46.1

ঽ '

- **cpu-protect type** *packet-type* **traffic-class** *traffic-class-num*
- **cpu-protect traffic-class id** *id_num* **bandwidth** *bandwidth_value*
- **cpu-protect traffic-class all bandwidth** *bandwidth_value*
- **cpu-protect cpu bandwidth** *bandwidth_value*
- **cpu-protect mac-address storm-control enable** *value*

46.1.1 cpu-protect type packet-type traffic-class *traffic-class-num*

cpu-protect type { **bpdu** | **arp** | **igmp** | **dot1x** | **gvrp** | **dhcp** | **unicast** | **multicast** | **broadcast** | **error_ttl** | **other**} **traffic-class** *traffic-class-num*

ð Ô

traffic-class-num ' id ˇ ˬ ˙ 0 ˙ 7 Â

ð Ô

ˬ show cpu-protect ঽ ˬ Â

ð ঽ Ô

Â

ð Ô

ЮO CPU BPDU '

```
Ruijie(config)# cpu-protect type bpdu traffic-class 5
Ruijie(config)# end
Ruijie # show cpu-protect type bpdu traffic-class
%**********packet type      traffic-class**********
                bpdu            5
```

ð ঽ Ô

ঽ	

cpu-protect traffic-class id *id_num* **bandwidth** *bandwidth_value*	
cpu-protect traffic-class all bandwidth *bandwidth_value*	
cpu-protect cpu bandwidth bandwidth_value	CPU

46.1.2 cpu-protect traffic-class id *id_num* bandwidth *bandwidth_value*

Â

cpu-protect traffic-class id *id_num* **bandwidth** *bandwidth_value*

ð Ô

id_num ' ID˜ ↓ ‰ 0˜ 7

bandwidth_value ' ˜ ↓ ‰ 32˜ 131072(kbps)

ð Ô

˜ ↓ show cpu-protect ¾ ↓ Â

ð ¾ Ô

Â

ð Ô

ЮО 7 ‰ 312(kbps)'

```
Ruijie#configure terminal
Ruijie(config)# cpu-protect traffic-class id 7
bandwidth 312
Ruijie(config)#end
Ruijie# show cpu-protect traffic-class id 7
%*********traffic class     bandwidth(kbps)**********
            7                 312
```

ð ¾ Ô

¾	
cpu-protect type *packet-type* **traffic-class** *traffic-class-num*	
cpu-protect traffic-class all bandwidth *bandwidth_value*	

cpu-protect cpu bandwidth *bandwidth_value*	CPU

46.1.3 cpu-protect traffic-class all bandwidth *bandwidth_value*

Â

cpu-protect traffic-class id *id_num* **bandwidth** *bandwidth_value*

ð Ô

bandwidth_value ' ˘ ¬ ù 32¨ 131072(kbps)

ð Ô

˘ ¬ show cpu-protect ¾ ¬ Â

ð ¾ Ô

Â

ð Ô

Ю ù 312(kbps)ў

```
Ruijie#configure terminal
Ruijie(config)# cpu-protect traffic-class all
bandwidth 312
Ruijie(config)#end
```

ð ¾Ô

¾	
cpu-protect type *packet-type* **traffic-class** *traffic-class-num*	
cpu-protect traffic-class id *id_num* **bandwidth** *bandwidth_value*	

46.1.4 cpu-protect cpu bandwidth ***bandwidth_value***

CPU

cpu-protect cpu bandwidth *bandwidth_value*

bandwidth_value ' ˘ ¬ ½ 64 1000000(kbps)

ð Ô

˘ ¬ show cpu-protect ¾ ¬ Â

ð ¾ Ô

Â

ð Ô

CPU ½ 2000 kbps˜ '

```
Ruijie#configure terminal
Ruijie(config)#cpu-protect cpu bandwidth 2000
Ruijie(config)#end
Ruijie#show cpu-protect cpu
%cpu port bandwidth: 2000(kbps)
```

ð ¾ Ô

¾	
cpu-protect type *packet-type* **traffic-class** *traffic-class-num*	
cpu-protect traffic-class id *id_num* **bandwidth** *bandwidth_value*	
cpu-protect traffic-class all bandwidth *bandwidth_value*	

46.2

CPU ¾ '

- **show cpu-protect type** *packet-type*
- **show cpu-protect traffic-class id** id_num
- **show cpu-protect traffic-class all**
- **show cpu-protect cpu**

46.2.1 show cpu-protect type packet-type

Â

show cpu-protect type *packet-type*

ð ¾ Ô

Â

ð Ô

¦ Â

ð Ô

ЛЬЮ **show cpu-protect type all** ¦ '

```
%**********packet type      traffic-class**********
               bpdu             6
               arp              5
               igmp             3
               dot1x            3
               gvrp             3
               dhcp             2
               unicast          4
               multicast        1
               broadcast        0
               error_ttl        0
               co-operate       6
               other            0
```

ð ¦ Ô

¦	
show cpu-protect traffic-class id *id_num*	Â id_num ¬ ù 0 7
show cpu-protect traffic-class all	
show cpu-protect cpu	CPU Â

46.2.2 show cpu-protect traffic-class id **id_num**

Â

show cpu-protect traffic-class id *id_num*

ð Ô

idt_num ' ¬ ù 0-7 Â

ð ¦ Ô

Â

ð Ô

¦ Â

ð Ô

Ю 1 CPU Â

```
Ruijie#show cpu-protect traffic-class id 1
%*********traffic class     bandwidth(kbps)**********
            1               1000
```

ð ¾Ô

¾	
show cpu-protect type *packet-type*	
show cpu-protect traffic-class all	
show cpu-protect cpu	CPU Â

46.2.3 show cpu-protect traffic-class all

show cpu-protect traffic-class all

ð ¾ Ô

Â

ð Ô

¾ Â

ð Ô

ЛuЮ **show cpu-protect traffic-class all** ¾

```
Ruijie# show cpu-protect traffic-class all
%*********traffic class     bandwidth(kbps)**********
            0               1000
            1               1000
            2               1000
            3               1000
            4               1000
            5               1000
            6               1000
            7               100000
```

ð ¾Ô

¾	

show cpu-protect type *packet-type*	
show cpu-protect traffic-class id *id_num*	Â id_num ৶ ӣ 0ˉ 7
show cpu-protect cpu	CPU Â

46.2.4 show cpu-protect cpu

CPU '

show cpu-protect cpu

ð ৡ Ô

Â

ð Ô

ৡ CPU Â

ð Ô

ЛЬЮ CPU '

```
Ruijie# show cpu-protect cpu
%cpu port bandwidth: 100000(kbps)
```

ð ৡ Ô

ৡ	
show cpu-protect type *packet-type*	
show cpu-protect traffic-class id *id_num*	Â id_num ৶ ӣ 0ˉ 7
show cpu-protect traffic-class all	

ð ϛ Ô

ϛ	
Show system-guard	ℸ

47.1.2 system-guard isolate-time seconds

Â ϛ **no** Â

system-guard isolate-time *seconds*

no system-guard isolate-time

ð Ô

seconds	Â ⁄ IP ╟ Â*second* ↓ ϰ 30 3600 ˘ ϰ 120

ð Ô

ϰ 120

ð ϛ Ô

Â

ð Ô

˘ IP second
Â ⁄ IP ╟ Â

ð Ô

Ю ϰ 100

```
Ruijie(config-if)# system-guard isolate-time 100
```

system-guard same-dest-ip-attack-packets *number*

no system-guard same-dest-ip-attack-packets

ð Ô

number	a IP a IP Â ˧ ѝ 0 2000 ˘ ѝ 20 Â 0 a Â

ð Ô

ѝ 20

ð ϡ Ô

Â

ð Ô

˘ ў ˩ ˘

Э ў ˘

Â

ð Ô

Ю ѝ 100

```
Ruijie(config-if)# system-guard
same-dest-ip-attack-packets  100
```

ð ϡ Ô

ϡ	
system-guard enable	ℸ

47.1.4 system-guard scan-dest-ip-attack-packets *number*

IP Â ϡ **no**

Â

system-guard scan-dest-ip-attack-packets *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	╖

47.1.5 system-guard detect-maxnum *number*

ў Â ϡ **no** Â

system-guard detect-maxnum *number*

no system-guard detect-maxnum

ð Ô

num	IP Â ↓ ы 1 500 ˘ ы 10 Â 0 a Â

ð Ô

ы 100

ð ϡ Ô

Â

ð Ô

˘ ľ ў /20 Ł ˩ ˩ Â ˘
ў ў ˘ ˩ Л
ў ˘ Л Â ˘
ў ˘ ў Â

ð Ô

Ю ў ѝ 200

```
Ruijie(config)# system-guard detect-maxnum 200
```

ð ʒ Ô

ʒ	

system-guard enablefjuTj/TT5}T Trf0TD-5086 0 TD0 4572714 Tc049b7472135424c060

```
Ruijie(config-if)# system-guard  exception
192.168.5.145 255.255.255.0
```

ð ϡÔ

ϡ	
system-guard enable	╗

47.1.7 clear system-guard [interface interface-id [ip-address ip-address]]

IP Â

clear system-guard [**interface** *interface-id* [*ip-address*]]

ð Ô

interface *interface-id*	
ip-address *ip-address*	IP

ð Ô

ð ϡ Ô

Â

ð Ô

ð Ô

Fastethernet 0/1 IP

```
Ruijie(config)# clear system-guard interface
fastethernet 0/1
```

ð ϡÔ

ϡ	
system-guard enable	╗

47.2

- **show system-guard** [**interface** *interface-id*]
- **show system-guard isolate-ip** [**interface** *interface-id*]
- **show system-guard detect-ip** [**interface** *interface-id*]
- **show system-guard exception-ip**

47.2.1 show system-guard [interface interface-id]

Â

show system-guard [**interface** *interface-id*]

ð Ô

interface *interface-id*	

ð Ô

ð Ô

Â

ð Ô

ð Ô

```
Ruijie# show system-guard
detect-maxnum number   : 100     //         ÿ
isolated host number   : 11        //          ÿ
inteface state isolate time same-attack-pkts
scan-attack-pkts
--------------------------- ----------------
Fa 0/1  ENABLE    120     20          10
Fa 0/2  DISABLE   110     21          11
……
Ruijie# show system-guard interface Fa 0/1
detect-maxnum number   : 100     //         ÿ
isolated host number   : 11        //          ÿ
inteface  state   isolate time  same-attack-pkts
scan-attack-pkts
--------------------------- ----------------
Fa 0/1  ENABLE    120           20            10
```

ð Ô

system-guard enable	

47.2.2 show system-guard isolate-ip [interface interface-id]

IP Â

show system-guard isolate-ip [**interface** *interface-id*]

Ô

interface *interface-id*	

Ô

Ô

Â

Ô

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
```

Ô

system-guard enable	

interface *interface-id*	

ð Ô

ð ì 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 ì Ô

ì	AÈ

48.1.2 security community

ৡ smp Ь ৸

security { [**v1 | v2**] **community** *community* | **v3 user** *username* }

no security { [**v1 | v2**] **community** *community* | **v3 user** *username* }

ð Ô

community ' ৸ Ь *community*

username ' v3 ৸

ð Ô

ð ৡ Ô

ð Ô

Ь ˘ Ь

৸ , v3ƺ **snmp-server**

ৡЮ v3 ৸˘ έ SNMP ৡ Â

ð Ô

v1 communityʹ

```
Ruijie(config)# security v1 community public
```

v3 ৸ й startʹ

```
Ruijie(config)# security v3 user start
```

ð ৡ Ô

ð ৶ Ô

RGOS10.1 Л৬Э

48.1.3 smp-server host

ৡ smp-server ip

smp-server host *ip-address*

no smp-server host

ð Ô

ip-address ' smp server ip

ð Ô

smp server

ð ৡ Ô

ð Ô

ৡ Â **show smp-server** Â

ð Ô

```
Ruijie(config)#smp-server host 192.168.4.243
```

ð ৡ Ô

ৡ	
show smp-server	smp server

ð ⊿ Ô

˚ RGOS10.1 Л Э

48.1.4 security event inteval

ৡ

security event inteval *interval*

no security event inteval

ð Ô

interval ' Y ˚ Â

ð Ô

5s

ð ৡ Ô

ð Ô

ৡ Â **show security event interval** Â

ð Ô

Y ˚ '

Ruijie(config)# **security event interval** *10*

ð ৡ Ô

ৡ	
show security event interval	Y ˚

ð ⊿ Ô

˚ RGOS10.1 Л Э

48.1.5 security address-bind enable

ৡ

security address-bind enable

no security address-bind enable

ð Ô

ð Ô

ð ৡ Ô

˘ γ ^ a AP AP ~

ð Ô

ৡ Â ˘ ৡ GSN

Â

ð Ô

Y ˚ '

Ruijie(config-if)# **security address-bind enable**

ð ৡ Ô

ৡ	
security gsn enable	GSN

ð ⊿ Ô

˚ RGOS10.1 Л Э

48.2

б ЛЬЮ ҳ'

show smp-server

show security event interval

48.2.1 show smp-server

smp server IP

ð Ô

ð ҳ Ô

ð Ô

smp server IP Â

ð Ô

```
Ruijie# show smp-server
SMP-Server IP' 192.168.20.30
```

ð ҳ Ô

ҳ	
smp-server host	smp server ip Â

ð ⁄ Ô

˚ RGOS10.1 Л Э

48.2.2 show security event interval

Y ˚ Â

ð Ô

ð ҳ Ô

ð Ô

Y ˚ Â

ð Ô

49 DAI

49.1 VLAN DAI

ֽ '

- **ip arp inspection vlan**

49.1.1 ip arp inspection vlan vlan-id

ֽˇ ˩ Л∪ *vlan-id* VLAN DAI ╗ Â
ֽ no ˩ Л∪ *vlan-id* VLAN DAI ╗ ˇ
vlan-id VLAN Э DAI ╗ Â

ip arp inspection vlan *vlan-id*

no ip arp inspection vlan [*vlan-id*]

ð Ô

vlan-id	vlan /ı Â

ð Ô

VLAN Э DAI ╗ Â

ð ֽ Ô

ð Ô

ֽ ˇ ¨I DAI ╗ ˇ Э Â

ð Ô

ЛЬЮ ˇ ѝ VLAN 1 Э ARP Â

```
Ruijie(config)# ip arp inspection
Ruijie(config)# ip arp inspection vlan 1
```

ð ֽ Ô

ֽ	
show ip arp inspection vlan	VLAN DAI ╗

49.2

49.2.1 ip arp inspection trust

γ ɻ ˘ ʒ **ip arp inspection trust** Â ʒ **no** γ ѝ a Â

ip arp inspection trust

no ip arp inspection trust

ð Ô

ð Ô

a Â

ð ʒ Ô

Â

ð Ô

ARP ˚ DAI ˘ ɻ Л
è ɻ ˘ a ARP ˘
Â

ð Ô

ЛЮ ˘ gigabitEthernet 0/19 ɻ Â

```
Ruijie(config)# interface gigabitEthernet 0/19
Ruijie(config-if)# ip arp inspection trust
```

ð ʒ Ô

- **ip arp inspection limit-rate**

49.3.1 ip arp inspection limit-rate limit-rate

ꟾ ARP ˘ ꝛ **ip arp inspection limit-rate** Â ꝛ **no** ˩ Л Â

ip arp inspection limit-rate {*limit-rate* | **none** }

no ip arp inspection limit-rate

ð Ô

none	a ⁸
limit-rate	˘ ˩ ѝ^ 1˜ 2048˜

ð Ô

⁸ ѝ 15 ARP / Â ѝ 0ˆ a ⁸˜ Â

ð ꝛ Ô

ð Ô

DAI ╖ ˘ ⁸ Â ˥ ˘ (Network Foundation Protection Policy) ╖ ˘ Л a Ѧ ꝛ Â

ð Ô

ЛЬЮ ˘ VLAN 2 gigabitEthernet 0/2 ⁸ ѝ 10 ARP / Â

```
Ruijie(config)# ip arp inspection
Ruijie(config)# interface gigabitEthernet 0/2
Ruijie(config-if)# ip arp inspection limit-rate 10
```

49.4 DHCP Snooping

VLAN DAI ╖ ˘ з ARP γ a ˩ ˘ ARP ˘ DHCP Snooping .

˘ ÂDHCP Snooping ê DHCP Snooping Ì

50 IP Source Guard

50.1 IP Source Guard

IP Source Guard ЮO ¾ ЮO ¾

- **ip source binding**

50.1.1 ip source binding

˘ ЮO ¾Â ¾ **no** ˘ Â

[**no**] **ip source binding** *mac-address* **vlan** *vlan-id ip-address* **interface** *interface-id*

ð Ô

mac-address ' ╕ MAC

vlan-id ' ╕ vlan id

ip-address ' ╕ IP

interface-id ' ╕

ð Ô

ЮO a

ð ¾ Ô

ð Ô

ð Ô

ЮO '

```
Ruijie# configure terminal
Ruijie(config)# ip source binding 00d0.f801.0101 vlan
1 192.168.4.243 interface fastEthernet 0/1
Ruijie(config)# end
Ruijie# show ip source binding
MacAddress  IpAddress  Lease(sec)  Type  VLAN
Interface
------------------ --------------- ------------
```

```
00d0.f801.0101 192.168.4.243 infinite  static   1
FastEthernet 0/1
Total number of bindings: 1
```

ð ֽ Ô

ֽ	
show ip source binding	IP ˚

50.2 IP Source Guard

IP Source Guard ╖ ЮЎ Ю ֽ

- **ip verify source**

50.2.1 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# configure terminal
Ruijie(config)# interface fastEthernet 0/1
Ruijie(config-if)# ip verify source
Ruijie(config-if)# end
Ruijie# show ip verify source
```

inactive-trust-port ' DHCP Snooping ⁸ ˘
╖ a '

active ' DHCP Snooping ⁸ ˘ ╖ Â

ð Ô

ÞO '

```
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 ¾ Ô

¾	
ip verify source	IP Source Guard ╖

50.3.2 show ip source binding

ÞO ¾˘ ┘Л IP ˚ Â

show ip source binding [*ip-address*] [*mac-address*]
[**dhcp-snooping**] [**static**] [**vlan** *vlan-id*] [**interface** *interface-id*]

ð Ô

ip-address ' ip

mac-address ' mac

dhcp-snooping ' ╟

static '

vlan-id ' vlan

interface-id '

ð Ô

Â

ð ¾ Ô

ð Ô

ð Ô

Ю IP ˚ '

```
Ruijie#show ip source binding
MacAddress       IpAddress      Lease(sec)   Type
VLAN  Interface
------------------ -------------- ------------ --
00d0.f801.0101   192.168.4.243   infinite    static
1    FastEthernet  0/1
Total number of bindings: 1
```

ð ¾Ô

¾	
ip source binding	

50.3.3 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
```

ð ¾Ô

51 ACL

ЛЬЮ ʒ ↓ ЛЬЮ ʒ

id	/ſ Â ↓ IP ACL: 1-99,1300-1999 IP ACL: 100-199,2000-2699 MAC ACL: 700–799 ж ACL: 2700–2899
name	ACL ɻ
sn	ACL /ſ (ˮI)
start-sn	/ſ
inc-sn	/ſ
deny	ʔ ˘
permit	ʔ ˘
prot	/ſ˘ IPv6 ↓ ŕ ipv6, icmp, tcp,udp 0-255˝ IPv4˝ ↓ Лъ eigrp, gre, ipinip, igmp, nos, ospf, icmp, udp, tcp, ip ˘ ≠ ↓ Лъ ʒ IP 0-255 /ſ˘ icmp/tcp/udp
interface idx	ʔ
src	ˆ ў ˜
src-wildcard	Â ↓ Лъ a ˘ 0.255.0.32
src-ipv6-pfix	IPv6
dst-ipv6-pfix	IPv6
pfix-len	Æ Æ
src-ipv6-addr	IPv6
[redacted]-addr	IPv6
dscp dscp	Ь , ˘ 0-63
flow-label flow-label	˘ 0-1048575
dst	ˆ ў ˜
dst-wildcard	Â ↓ Лъ a ˘ 0.255.0.32

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 /ˇ γ ч /ˇ ˘ ѐ /ˇ
src-mac-addr	ў
dst-mac-addr	ў
VID vid	vlan id
VID inner vid	tag vid
ethernet-type	Л ˘ ˩ Л 0x

C		12	Q	IP	36
D	VLAN tag	14	R	ip	38
E	DSAP(⊾)	18	S	ip	42
F	SSAP(⊾)	19	T	TCP	46
G	Ctrl	20	U	TCP	48
H	Org Code	21	V	/\	50
I		24	W		54
J	IP /\	26	XY	IP Æ	58

¸

- **ip access-group**
- **mac access-group**
- **expert access-group**
- **ipv6 traffic-filter**

51.1.1 access-list

¸ ˘ Â ¸ **no** Â

1) IP ˆ 1 - 99˜ 1300 - 1999˜

access-list *id* {**deny** | **permit**} {*source source-wildcard* | **host** *source* | **any**}

2) IP ˆ 100 - 199˜ 2000 - 2699˜

access-list *id* {**deny** | **permit**} **protocol** {*source source-wildcard* | **host** *source* | **any**} {*destination destination-wildcard* | **host** *destination* | **any**} [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**time-range** *time-range-name*]

3) MAC ˆ 700 - 799˜

access-list *id* {**deny** | **permit**} {**any** | **host** *source-mac-address*} {**any** | **host** *destination-mac-address*} [*ethernet-type*][**cos** [*out*][**inner** *in*]]

4) Expert ˆ 2700 - 2899˜

access-list *id* {**deny** | **permit**} [**protocol** | [*ethernet-type*][**cos** [*out*]]5.0[2[7[1[1[9[9[0

destination-mac-address | **any**} [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**time-range** *time-range-name*]

Expert

- **urg**
- **ack**
- **psh**
- **rst**
- **syn**
- **fin**

  ″l ⅄ HO′

- **ACL** ৡ

- **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 ɹ ˘ TCP ɻ Ʌʊ ɹ /ʅ ɛ
ˈ

- **bgp**
- **chargen**
- **cmd**
- **daytime**
- **discard**
- **domain**
- **echo**
- **exec**
- **finger**
- **ftp**

- **ftp-data**
- **gopher** p - d a t a **t** f t p - d a t a **p**

7213Oc309b709e12fc402c

- **pim-auto-rp**
- **rip**
- **snmp**
- **snmptrap**
- **sunrpc**
- **syslog**
- **tacacs**
- **talk**
- **tftp**
- **time**
- **who**
- **xdmcp**

Л Ethernet-type Ю

- **aarp**
- **appletalk**
- **decnet-iv**
- **diagnostic**
- **etype-6000**
- **etype-8042**
- **lat**
- **lavc-sca**
- **mop-console**
- **mop-dump**
- **mumps**
- **netbios**
- **vines-echo**
- **xns-idp**

ð Ô

1) IP

Ю IP й 192.168.1.64 - 192.168.1.127
˘ è '

```
Ruijie(config)# access-list 1 permit 192.168.1.64
0.0.0.63
```

2) IP

Ю IP DNS ICMP '

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

51.1.3 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

51.1.4 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 /Ì^ 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

51.1.5 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 extended v6-acl
Ruijie(config-ipv6-nacl)#
```

ð ¾ Ô

¾	
show access-lists	IPV6

ð ¸ Ô

˚ RGOS10.0 Л Э

51.1.6 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′ /

inc-sn' /

ð Ô

start-sn' 10

inc-sn' 10

ð ¾ Ô

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 ¾ Ô

¾	
show access-lists	

ð Ø Ô

˚ RGOS10.0 ЛЪЭ

51.1.7 deny

(deny) ˚ Лъ ã Â
ACL Ю˝ ACL Â

1) IP

[*sn*] **deny** {*source source-wildcard* | **host** *source* | **any**}

2) IP

[*sn*] **deny protocol** *source source-wildcard destination destination-wildcard* [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**time-range** *time-range-name*]

IP 8 '

Internet Control Message Protocol (ICMP)

[*sn*] **deny icmp** {*source source-wildcard* | **host** *source* | **any**} {*destination destination-wildcard* | **host** *destination* | **any**} [*icmp-type*] [[*icmp-type* [*icmp-code*]] | [*icmp-message*]] [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**time-range** *time-range-name*]

Transmission Control Protocol (TCP)

[*sn*] **deny tcp** {*source source-wildcard* | **host** *Source* | **any**} [*operator* **port** [*port*]] {*destination destination-wildcard* | **host** *destination* | **any**} [*operator* **port** [*port*]] [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**time-range** *time-range-name*] [**match-all** *tcp-flag*]

User Datagram Protocol (UDP)

[*sn*] deny udp {*source source –wildcard* | **host** *source* | **any**} [*operator* **port** [*port*]] {*destination destination-wildcard* | **host** *destination* | **any**} [*operator* **port** [*port*]] [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**time-range** *time-range-name*]

3) MAC

[*sn*] **deny** {**any** | **host** *source-mac-address*}{**any** | **host** *destination-mac-address*} [*ethernet-type*][**cos** [*out*] [**inner** *in*]]

4) Expert

[*sn*] **deny**[**protocol** | [*ethernet-type*][**cos** [*out*] [**inner** *in*]]] [[**VID** [*out*][**inner** *in*]]] {*source source-wildcard* | **host** *source* | **any**}{**host** *source-mac-address* | **any** } {*destination destination-wildcard* | **host** *destination* | **any**} {**host** *destination-mac-address* | **any**} [**precedence** *precedence*] [**tos** *tos*][**fragments**] [**time-range** *time-range-name*]

Л∪ ethernet-type cos

[*sn*] **deny** {[*ethernet-type*}[**cos** [*out*] [**inner** *in*]]} [[**VID** [*out*][**inner** *in*]]] {*source source-wildcard* | **host** *source* | **any**} {**host** *source-mac-address* | **any** } {*destination destination-wildcard* | **host** *destination* | **any**} {**host** *destination-mac-address* | **any**} [**time-range** *time-range-name*]

protocol

[*sn*] **deny protocol** [[**VID** [*out*][**inner** *in*]]] {*source source-wildcard* | **host** *source* | **any**} {**host** *source-mac-address* | **any** } {*destination destination-wildcard* | **host** *destination* | **any**} {**host** *destination-mac-address* | **any**} [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**time-range** *time-range-name*]

expert

Internet Control Message Protocol (ICMP)

[*sn*] **deny icmp** [[**VID** [*out*][**inner** *in*]]] {*source source-wildcard* | **host** *source* | **any**} {**host** *source-mac-address* | **any**} {*destination destination-wildcard* | **host** *destination* | **any**} {**host** *destination-mac-address* | **any**} [*icmp-type*] [[*icmp-type* [*icmp-code*]] | [*icmp-message*]] [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**time-range** *time-range-name*]

Transmission Control Protocol (TCP)

[*sn*] **deny tcp** [[**VID** [*out*][**inner** *in*]]]{*source source-wildcard* | **host** *Source* | **any**} {**host** *source-mac-address* | **any** } [*operator* **port** [*port*]] {*destination destination-wildcard* | **host** *destination* | **any**} {**host** *destination-mac-address* | **any**} [*operator* **port** [*port*]] [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**time-range** *time-range-name*] [**match-all** *tcp-flag*]

User Datagram Protocol (UDP)

[*sn*] **deny 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) 5˜ IPV6

[*sn*] **deny protocol**{*source-ipv6-prefix*/*prefix-length* | **any** | **host** *source-ipv6-address*} {*destination-ipv6-prefix / prefix-length* | **any** | *hostdestination-ipv6-address*} [**dscp** *dscp*] [**flow-label** *flow-label*] [**fragments**] [**time-range** *time-range-name*]

IPV6 ⁸ '

Internet Control Message Protocol (ICMP)

[*sn*]**deny icmp** {*source-ipv6-prefix / prefix-length* | *any source-ipv6-address* | **host**} {*destination-ipv6-prefix* / *prefix-length* | **host** *destination-ipv6-address* | **any**} [*icmp-type*] [[*icmp-type* [*icmp-code*]] | [*icmp-message*]] [**dscp** *dscp*] [**flow-label** *flow-label*] [**fragments**] [**time-range** *time-range-name*]

Transmission Control Protocol (TCP)

[*sn*] **deny tcp** {*source-ipv6-prefix / prefix-length* | **host** *source-ipv6-address* | **any**}[*operator* **port**[*port*]] {*destination-ipv6-prefix /prefix-length* | **host** *destination-ipv6-address* | **any**} [*operator* **port** [*port*]] [**dscp** *dscp*] [**flow-label** *flow-label*] [**fragments**] [**time-range** *time-range-name*] [**match-all** *tcp-flag*]

User Datagram Protocol (UDP)

[sn] **deny udp** {*source-ipv6-prefix/prefix-length* | **host**

source-ipv6-address | **any**} [*operator* **port** [*port*]]
{*destination-ipv6-prefix /prefix-length* | **host** *destination-ipv6-address* |
any}[*operator* **port** [*port*]] [**dscp** *dscp*] [**flow-label** *flow-label*]
[**fragments**] [**time-range** *time-range-name*]

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 ϡ Ô

ACL Ю

ð Ô

ACL Ю ACL ˚

ð Ô

Ю м ﻫ Л

Ю IP ACL ˘ IP й 192.168.4.12 ў
TCP й 100 ˘ 1Â

```
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 Ьѫ
mac access-list	MAC ACL Ьѫ
expert access-list	ж ACL Ьѫ
ipv6 access-list	IPV6 ACL Ьѫ
permit	Ьѫ ¾

ð ✓ Ô

˚ RGOS10.0 Л Э

51.1.8 permit

(**permit**) ˚ Л ā
Â ACL Ю ACL
Â

1) IP

[*sn*] **permit** {*source source-wildcard* | **host** *source* | **any**}

2) IP

[*sn*] **permit protocol** *source source-wildcard destination*

destination-wildcard [**precedence** *precedence*] [**tos** *tos*] [**fragments**]

[**time-range** *time-range-name*]

IP 8 '

Internet Control Message Protocol (ICMP)

[*sn*] **permit icmp** {*source source-wildcard* | **host** *source* | **any**}
{*destination destination-wildcard* | **host** *destination* | **any**}

[*icmp-type*] [[*icmp-type* [*icmp-code*]] | [*icmp-message*]] [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**time-range** *time-range-name*]

Transmission Control Protocol (TCP)

[*sn*] **permit tcp** {*source source-wildcard* | **host** *Source* | **any**} [*operator* **port** [*port*]] {*destination destination-wildcard* | **host** *destination* | **any**} [*operator* **port** [*port*]] [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**time-range** *time-range-name*] [**match-all** *tcp-flag*]

User Datagram Protocol (UDP)

[*sn*] **permit udp** {*source source -wildcard*|**host** *source* |**any**} [*operator* **port** [*port*]] {*destination destination-wildcard* |**host** *destination* | **any**} [**operator port** [*port*]] [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**time-range** *time-range-name*]

3) MAC

[*sn*] **permit** {**any** | **host** *source-mac-address*} {**any** | **host** *destination-mac-address*} [*ethernet-type*][**cos** [*out*] [**inner** *in*]]

4) Expert

[*sn*] **permit** [**protocol** | [*ethernet-type*][**cos** [*out*] [**inner** *in*]]] [**VID** [*out][***inner** *in]*] {*source source-wildcard* | **host** *source* | **any**} {**host** *source*-**mac**-*address* | **any** } {*destination destination-wildcard* | **host** *destination* | **any**} {**host** *destination-mac-address* | **any**} [**precedence** *precedence*] [**tos** *tos*][**fragments**] [**time-range** *time-range-name*]

Ethernet-type cos

[*sn*] **permit** {*ethernet-type*| **cos** [*out*] [**inner** *in*]} [**VID** [*out*][**inner** *in*]] {*source source-wildcard* | **host** *source* | **any**} {**host** *source-mac-address* | **any** } {*destination destination-wildcard* | **host** *destination* | **any**} {**host** *destination-mac-address* | **any**} [**time-range** *time-range-name*]

Protocol

[*sn*] **permit protocol** [**VID** [*out][***inner** *in*]] {*source source-wildcard* | **host** *Source* | **any**} {**host** *source-mac-address* | **any** } {*destination destination-wildcard* | **host** *destination* | **any**} {**host** *destination-mac-address* | **any**} [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**time-range** *time-range-name*]

Expert

Internet Control Message Protocol (ICMP)

[*sn*] **permit icmp** [**VID** [*out*][**inner** *in*]] {*source source-wildcard* | **host** *source* | **any**} {**host** *source-mac-address* | **any** } {*destination destination-wildcard* | **host** *destination* | **any**} {**host**

destination-mac-address | **any**}[*icmp-type*] [[*icmp-type* [*icmp-code*]] | [*icmp-message*]] [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**time-range** *time-range-name*]

Transmission Control Protocol (TCP)

[*sn*] **permit tcp** [**VID** [*out*][**inner** *in*]]{*source source-wildcard* | **host** *Source* | **any**} {**host** *source-mac-address* | **any** } [*operator* **port** [*port*]] {*destination destination-wildcard* | **host** *destination* | **any**} {**host** *destination-mac-address* | **any**} [*operator* **port** [*port*]] [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**time-range** *time-range-name*] [**match-all** *tcp-flag*]

User Datagram Protocol (UDP)

[*sn*] **permit udp** [**VID** [*out*][**inner** *in*]]{*source source –wildcard* | **host** *source* | **any**} {**host** *source-mac-address* | **any** } [*operator* **port** [*port*]] {*destination destination-wildcard* | **host** *destination* | **any**} {**host** *destination-mac-address* | **any**} [*operator* **port** [*port*]] [**precedence precedence**] [**tos** *tos*] [**fragments**] [**time-range** *time-range-name*]

5) IPV6

[*sn*] **permit protocol** {*source-ipv6-prefix* / *prefix-length* | **any** | **host** *source-ipv6-address*} {*destination-ipv6-prefix* / *prefix-length* | **any** | *hostdestination-ipv6-address*} [**dscp** *dscp*] [**flow-label** *flow-label*] [**fragments**] [**time-range** *time-range-name*]

IPV6

Internet Control Message Protocol (ICMP)

[*sn*] **permit icmp** {*source-ipv6-prefix* / *prefix-length* | **any** *source-ipv6-address* | **host**} {*destination-ipv6-prefix* / *prefix-length* | **host** *destination-ipv6-address* | **any**} [*icmp-type*] [[*icmp-type* [*icmp-code*]] | [*icmp-message*]] [**dscp** *dscp*] [**flow-label** *flow-label*] [**fragments**] [**time-range** *time-range-name*]

Transmission Control Protocol (TCP)

[*sn*] **permit tcp** {*source-ipv6-prefix* / *prefix-length* | **host** *source-ipv6-address* | **any**} [*operator* **port** [*port*]] {*destination-ipv6-prefix* / *prefix-length* | **host** *destination-ipv6-address* | **any**} [*operator* **port** [*port*]] [**dscp** *dscp*] [**flow-label** *flow-label*] [**fragments**] [**time-range** *time-range-name*] [**match-all** *tcp-flag*]

User Datagram Protocol (UDP)

[*sn*] **permit udp** {*source-ipv6-prefix* / *prefix-length* | **host** *source-ipv6-address* | **any**} [*operator* **port** [*port*]] {*destination-ipv6-prefix* / *prefix-length* | **host**

ACL ३

expert access-list	ж ACL Ⱨ
ipv6 access-list	IPV6 ACL Ⱨ
deny	Ⱨ ACL

ð ⊿ Ô

˚ RGOS10.0 Л Э

51.1.9 list-remark

ὶ ACL ╗ ˘ **no**

list-remark *text*

ð Ô

Text ′

ð ʒ Ô

ACL

ð Ô

ὶ ACL ╗

ð Ô

```
Ruijie# ip access-list extended 102
Ruijie(config-ext-nacl)# list-remark this acl is to
filter the host 192.168.4.12
Ruijie(config-ext-nacl)# show access-lists
ip access-list extended 102
deny ip host 192.168.4.12 any
1000 hits
this acl is to filter the host 192.168.4.12
Ruijie(config-ext-nacl)#
```

```
Ruijie# configure terminal
Ruijie(config)# access-list 88 list-remark
last_comment
```

ð ʒ Ô

ʒ	

show access-lists

˚ RGOS10.3(5) Â

51.1.11 no sn

ACL

no *sn*

ð Ô

sn ' ù 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 Ⱶ
ipv6 access-list	IPV6 ACL Ⱶ
deny	Ⱶ Ⱶ ACL
permit	Ⱶ Ⱶ ACL

ð ✓ Ô

51.1.13 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

ACL

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

51.1.14 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 /Ì^ 2700-2899˜

name ' Expert ¿

in '

out ' ÿ

ð Ô

Expert ACL

ð ¾ Ô

ð Ô

ACL Э˜ è ⁸ 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 ¾ Ô

¾	
show access-group	Э ACL Â

ð ¿ Ô

˚ RGOS10.0 Л Э

51.1.15 ipv6 traffic-filter

IPV6 ACL Â ¾ no ¿ Â

ipv6 traffic-filter *name* {**in** | **out**}

no ipv6 traffic-filter *name* {**in** | **out**}

ð Ô

name ' IPV6 ¿

in '

out ' ÿ

ð Ô

IPV6 ACL

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 ¾ Ô

¾	
show access-group	Э ACL Â

ð ¼ Ô

˚ RGOS10.0 Лъ Э

51.2

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**

51.2.1 show access-lists

ACL ¼ ACL

show access-lists [*id* | *name*]

ð Ô

id ′ /I

name ′ ɹ

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 ㅱÂ
mac access-list	MAC ACL ㅱ
expert access-list	Expert ACL ㅱ
ipv6 access-list	IPv6 ACL ㅱ

ð ⅄ Ô

˚ RGOS10.0 ЛЪ Э

51.2.2 show ip access-group

IP ACL

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 Ht Â

ð Ô

˚ RGOS10.0 Л Э

51.2.3 show expert access-group

Expert Â

show expert access-group [**interface** <*interface*>]

ð Ô

<*interface* R

ð Ô

˚ RGOS10.0 Л Э

51.2.4 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

51.2.5 show ipv6 traffic-filter

IPV6

show ipv6 traffic-filter [**interface** <*interface*>]

ð Ô

<*interface*> '

ð Ô

ð Ô

IPv6 ACLˇ ˇ 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 ৡ Ô

ৡ	
ipv6 access-list	IPV6 ACL ㅾ

ð ⊿ Ô

˚ RGOS10.0 Л Э

51.2.6 show access-group

Э ACL

show access-group [**interface** <*interface*>]

ð Ô

<*interface*> '

ð ৡ Ô

ð Ô

Э ACLˇ 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 ৡ Ô

ip access-group	ip
mac access-group	MAC
expert access-group	Expert
ipv6 traffic-filter	IPV6

RGOS10.0

52 QOS

52.1

QoS ˘ QoS ЛЬЮ '

1 policy-map

policy-map ↓ Л Ь class-map

class-map 1 ACL˘ ACL ACE ѓ ↓

Э ACE ÿ “ ACL” ⁸

Ю˘ QoS ╖ Â ↓ Â
Policy Map Э˘ ˘
QoS ╖ Â QoS ╖ ˘ ā
Policy Map ˘ ù Off ↓ ÂЛЬЮ ù

QOS '

CoS	0
	8
	WRR
QueueWeight	1:1:1:1:1:1:1:1
WRR Weight Range	1:15
DRR Weight Range	1:15
	No Trust

Cos

CoS	0	1	2	3	4	5	6	7
	1	2	3	4	5	6	7	8

CoS to DSCP

CoS	0	1	2	3	4	5	6	7
DSCP	0	8	16	24	32	40	48	56

IP-Precedence to DSCP

IP-Precedence	0	1	2	3	4	5	6	7
			16	24	32	40	48	56

ð ৡ Ô

ð Ô

MAC ACL, ৶ 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, ৶ 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

52.2.4 Policy Maps

policy map˘ policymap

[**no**] **policy-map** *policy-map-name*

policy map class-map ৷ , ৷

[**no**] **class** *class-map-name*

IP ipdscp ˘ IP a

set ip dscp *new-dscp*

no set ip dscp

⁸ ὶ ৷ ╠

police *rate-bps burst-byte*[**exceed-action** {**drop** | **dscp** *dscp-value*}]

no police

ð Ô

policy-map-name ' policymap ﾉ '

no policy-map *policy-map-name* ' policy map'

class-map-name ' class map ﾉ '

no class *class-map-name* ' ｷ '

new-dscp ' DSCP ' ﾙ a ﾉ a ﾉ'

rate-bps ' ⁸ ˘ Æ kbps'

burst-byte' ⁸ ˘ Æ kbyte'

drop ' ｷ '

dscp-value ' ｷ DSCP ﾙ a ﾉ a ﾉ Â

ð ৡ Ô

ð Ô

policy map, ﾉ po

```
Ruijie(config)# policy-map po
```

class-map cm

```
Ruijie(config-pmap)# class cm
```

dscp ﾍ 10

```
Ruijie(config-pmap-c)# set ip dscp 10
```

ﾍ 1M, ﾍ 4096k, ╟ ﾍ dscp 16

```
Ruijie(config-pmap-c)# police 1000000 4096
exceed-action dscp 16
```

ð ৡ Ô

show policy-map

52.2.5 service-policy

policy map Э

service-policy {**input** | **output**} *policy-map-name*

no service-policy {**input** | **output**}

ð Ô

policy-map-name ' policymap ɹ

no ' policy map Э

ð ֳ Ô

ð Ô

```
Ruijie(config)# interface fastEthernet 0/1
Ruijie(config-if)# service-policy input po
```

```
Ruijie(config)# virtual-group 3
Ruijie(config-if)# service-policy input po
```

ð ֳ Ô

show mls qos interface

ð ɻ Ô

virtual-group Ю a output

52.2.6 priority-queue

[**no**] **priority-queue**

ð Ô

priority-queue й SP

no priority-queue й WRR

ð Ô

й WRR

ð ֳ Ô

ð Ô

```
Ruijie(config)# no priority-queue
```

ð ֳ Ô

show mls qos queueing

52.2.7 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

ð ৶ Ô

52.2.8 wrr-queue bandwidth

WRR

wrr-queue bandwidth *weight1 ... weightn*

no wrr-queue bandwidth

ð Ô

weight1...weightn ѝ n ˘ n ৶ '

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

ð ⊀ Ô

52.2.9 mls qos map cos-dscp

P C **&15B** CoS D DSCP Ļ

mls qos map cos-dscp

dscp-list ' ৸ a ৶ a ৶

cos ' ৸ 0˙ 7

no '

ð Ô

?•5 ,ÕG!5B

?•e ,ÕG!5B

mls qos scheduler [**sp** | **wrr** | **drr**]

no mls qos scheduler

ð Ô

sp ' ″l

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

52.2.13 drr-queue bandwidth

DRR

drr-queue bandwidth *weight1...weight8*

no drr-queue bandwidth

ð Ô

weight1...weight8 ' ৶

no '

ð Ô

ð ৡ Ô

ð Ô

```
Ruijie(config)# drr-queue bandwidth 1 2 3 4 5 6 7 8
```

ð ৡ Ô

show mls qos queueing

ð ৶ Ô

86

52.2.14 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 ' ৶ a ৸ a ৸

no '

ð Ô

ð ৡ Ô

ð Ô

```
Ruijie(config)# mls qo map ip-prec -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

buffer management qos queue

buffer management qos queue *queue-number*

ð Ô

queue-number	

ð Ô

"l ‡ 8 ৸ ă ਖ

"I ٭ ă ш

ð ٪ Ô

ð Ô

╕ AP

queue-number и 1 ˘ a ш٭ "I

ð Ô

Ю Л∪ 0/52 3 '

```
Ruijie(config)# interface gigabitethernet 0/52
Ruijie(config-if)# buffer management qos queue 8
```

ð ٪ Ô

٪	
show buffer management queue	

ð ⊿ Ô

˚ RGOS10.35 Л∪Э

virtual-group

Aggregate Port и Â

٪ no Â

virtual-group *virtual-group-number*

no virtual-group *virtual-group-number*

ð Ô

virtual-group-number	/I˘ /I˘ 128

ð Ô

a

ð ٪ Ô

ð Ô

class-name ' class map ¸

ð Ô

policy name

ð ¾ Ô

ð Ô

```
Ruijie# show policy-map
```

52.3.3 show mls qos interface

QoS

show mls qos interface *interface-id* [**policers**]

ð Ô

interface-id '

policers ' police

ð Ô

QOS

ð ¾ Ô

ð Ô

```
Ruijie# show mls qos interface fastEthernet 0/1
```

52.3.4 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 ¾ Ô

ð Ô

```
Ruijie# show mls qos virtual-group 1
Ruijie# show mls qos virtual-group policers
```

52.3.5 show mls qos queueing

QoS (cos-to-queue map,wrr weight,drr weight)

show mls qos queueing

ð ৡ Ô

ð Ô

```
Ruijie# show mls qos queueing
```

52.3.6 show mls qos scheduler

″I

show mls qos scheduler

ð ৡ Ô

ð Ô

```
Ruijie# show mls qos scheduler
```

52.3.7 show mls qos maps

dscp-cos maps,dscp-cos maps ip-prec-dscp maps

show mls qos maps [**cos-dscp** | **dscp-cos** | **ip-prec-dscp**]

ð Ô

cos-dscp ' cos-dscp maps

dscp-cos ' dscp-cos maps

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**

52.3.8 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**

52.3.9 how buffer management qos queue

show buffer management qos queue

ð Ô

ð ৡ Ô

ð Ô

```
Ruijie#show buffer management qos queue
Interface             Status  Queue
-------------------------------------
FastEthernet    0/1   Auto   8
FastEthernet    0/2   Admin  8
....
GigabitEthernet 0/52  Auto   8
```

52.3.10 show virtual-group

show virtual-group [*virtual-group-number* | **summary**]

ð Ô

virtual-group-number' /Ì˘
/Ì˘ 128

summary'

ð ¾ Ô

ð Ô

```
Ruijie# show virtual-group 1
Ruijie# show virtual-group summary
```

53 VRRP

53.1

VRRP ३ '

- **vrrp authentication**
- **vrrp delay**
- **vrrp description**
- **vrrp ip**
-

```
vrrp 1 authentication x30dn78k
```

ð ֽ Ô

ֽ	
Ruijie(config-if)# **vrrp** *group ip ipaddress* [**secondary**]	VRRP ╥ IP

53.1.2 vrrp delay

ֽ Э VRRP ╟ Â

vrrp delay { **minimum** *min-seconds* | **reload** *reload-seconds* }

no vrrp delay

ð Ô

min-seconds ' ↓ й ╟ ˇ VRRP *min-seconds* ∧ ╟'

reload-seconds ' ╟ VRRP ╟ Â *min-seconds reload-seconds*˘ ╟ VRRP *min-seconds* Â

ð Ô

Ю˘ Э VRRP ╟╥ Â

ð ֽ Ô

ð Ô

ð Ô

╟à ↓ й UP ˇ Э VRRP a ╟à Ą ╟ ˇ ↓ ֽ Э VRRP ╟ Â ч ∨ 0~60 Â

ð Ô

Ю Л∪ E0 Э VRRP ╟ й 10 ' ж ↓ й UP ˇ Э VRRP 1 10 ∧ Ą ╟'

```
interface FastEthernet 0/0
shutdown
ip address 10.0.1.1 255.255.255.0
vrrp delay minimum 10
vrrp 1 ip 10.0.1.20
no shutdown
show vrrp 1
```

ð ֽ Ô

٪	
Ruijie(config-if)# **vrrp** *group* **ip** *ipaddress* [**secondary**]	VRRP ╖ IP

ð Ô

٪ ÿ RGOS10.3(4) Â

53.1.3 vrrp description

٪ ѝ VRRP ˘ è **no** Â

vrrp *group* **description** *text*

no vrrp group description

ð Ô

group ' VRRP Л'

text ' VRRP Â

ð Ô

Ю˝ Э VRRP ╖ Â VRRP ╖ ˘ ≠ VRRP Â

ð ٪ Ô

ð Ô

ѝ VRRP ˘ ┘Л Ш¦ VRRP Â

ð Ô

Ю Л∪ E0 Э VRRP 1 ѝ Building A – Marketing and Administration Â

```
interface FastEthernet 0/0
ip address 10.0.1.1 255.255.255.0
vrrp 1 ip 10.0.1.20
vrrp 1 description “Building A - Marketing and Administration”
```

ð ٪ Ô

53.1.4 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

ð Ô

Ю˝ Э VRRP ╖ Â

ð ֽ Ô

ð Ô

a secondary ˘ ж Ɑ Â /'

vrrp *group* **preempt** [**delay** *seconds*]

no vrrp *group* **preempt** [**delay**]

ð Ô

group ' VRRP /ı

delay *seconds* ' ˙ ˘ ЊЖ Master
Â ѝ 0 Â

ð Ô

ЮЎ Э VRRP ╖ Â VRRP ╖ ˘
VRRP ´ ЮÂ

ð ֽ Ô

ð Ô

VRRP ´ ЮЎ ”I
Master ”I ˘ ´ ѝ VRRP ў Â VRRP

group ' VRRP /I

level ' VRRP ″I

ð Ô

ЮЎ Э VRRP ╖ Â VRRP ╖ ˘ VRRP è ″I ù 100 Â

ð ३ Ô

ð Ô

३ ╟ VRRP ″I Â

ð Ô

Ю VRRP 1 ″I ù 254 Â

```
vrrp 1 priority 254
```

ð ३ Ô

३	
Ruijie(config-if)# **vrrp** *group* **ip** *ipaddress* [**secondary**]	VRRP ╖ IP
Ruijie(config-if)# **vrrp** *group* **preempt** [**delay** *seconds*]	VRRP ´

53.1.7 vrrp timers advertise

३ ў VRRP ˘ è no Â

vrrp *group* **timers advertise** *interval*

no vrrp *group* **timers advertise**

ð Ô

group ' VRRP /I'

interval ' VRRP (Л∪ ù æ) Â

ð Ô

ЮЎ Э VRRP ╖ Â VRRP ╖ ˘ ў ù 1 Â

ð ३ Ô

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 ֽ Ô

ֽ	
Ruijie(config-if)# **vrrp** *group* **ip** *ipaddress* [**secondary**]	VRRP ╖ IP
Ruijie(config-if)# **vrrp group timers learn**	˝ ╖

53.1.8 vrrp timers learn

ֽ ˝ ╖ ˘ 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

ð ֽ Ô

ð Ô

˝ ╖ ˘ VRRP ˘
˝ ╖ Л˘ ÿ ў VRRP ˝ VRRP
˘ Master ˘ a
VRRP Â ֽ ↓ Л∪ б Master VRRP
↓ Â

ð Ô

Ю VRRP 1 Э ˝ ╖ Â

```
vrrp 1 timers learn
```

ð ֽ Ô

ৡ	
Ruijie(config-if)# **vrrp** *group* **ip** *ipaddress* [**secondary**]	VRRP ╖ IP
Ruijie(config-if)# **vrrp** *group* **timers advertise** [**msec**] *interval*	VRRP

53.1.9 vrrp track

VRRP **vrrp** *group* **track** *interface-type number* ৡ˘ VRRP IP ╖ ˘ **vrrp** *group* **track** *ip-address* ৡ˘ **vrrp** *group* **track bfd** BFD IP˝ è **no** ╖ Â ৡ 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 ˘ bfd

interval-value ' ┘ Â a ˘ ỳ 3

timeout-value ' å a ┘ Â a ˘ ỳ 1

priority ' ┘ ┘ è VRRP ″I ┘ Â a ˘ ỳ 10

ð Ô

Ю˝ Э VRRP ╖ Â VRRP ╖ ˘ IP Â

ð ৡ Ô

ð Ô

ન Л Ъ ३ ˘ Ь
ન (Routed Port ˘ SVI ˘ Loopbacк Tunnel) ’
IP ન ˘ ping Â

ð Ô

Ю ˘ VRRP 1 Routed Port Fa1/1 Â Fa1/1
˘ VRRP ″I 30′ Fa1/1 Л˘ VRRP
1 ″I Â

```
vrrp 1 track FastEthernet 1/1 30
```

```
# VRRP BFD 192.168.1.3
Ruijie#
```

- **debug vrrp events**
- **debug vrrp packets**
- **debug vrrp state**

53.2.1 debug vrrp

debug vrrp errors

no debug vrrp errors

ð Ô

ÞÖ VRRP Â

ð ¾ Ô

ð Ô

ÞO ˘ 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
```

53.2.3 debug vrrp events

¾ VRRP Y˚ ˘ è no Â

debug vrrp events

no debug vrrp events

ð Ô

ÞÖ VRRP Y˚ Â

ð ¾ Ô

ð Ô

ÞO ˘ 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
```

53.2.4 debug vrrp packets

¾ VRRP ˘ è **no** 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
```

53.3

53.3.1 show vrrp

ৡ VRRP Â

show vrrp [**brief** | *group*]

ð Ô

brief ' ˩ ˘ VRRP

group ' VRRP /ı

ð ৡ Ô

ð Ô

a ˩ ˘ VRRP Â

ð Ô

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
```

ð ৡ Ô

```
Ruijie(config-if)# bfd interval 100 min_rx 100 multiplier 3
```

ð ¾Ô

¾	
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

Ю OSPF б BFD ╠Â
Ruijie(config)# **router ospf** 123
Ruijie(config-router)# **bfd all-interface**

ð ¾Ô

¾	
bfd	BFD Â
ip ospf bfd	OSPF б BFD ╠Â

```
#          BFD          Â
Ruijie(config)# bfd cpp
```

ð ¾Ô

¾	
-	-

ð ¼ Ô

54.1.4 bfd echo

ÞO **bfd echo** ¾ echo ˘ **no** ¾ echo Â

bfd echo

no bfd echo

ð Ô

-	-

ð Ô

ÞO BFD echo

ð ¾ Ô

ð Ô

ÞO BFD ¼ ╟ echo ˘ echo **Interval milliseconds** **min_rx** *milliseconds* Â

¾ a L3 AP ÞO BFD ECHO , BFD Э **no ip** ~ **redirects** ICMP ╖ ˘ **no ip deny land** ¾ DDOS ╖ (Land-based) Echo BFD

```
Ruijie(config)# no switchport
Ruijie(config-if)# bfd echo
```

ð ¾ Ô

¾	
bfd	BFD Â
ip redirects	ICMP ¶ Â
ip deny land	Land-based ¶ Â
bfd slow-timer	

ð ¼ Ô

54.1.5 bfd slow-timer

Ю **bfd slow-timer** ¾ BFD ECHO ¶ ¼˘ ˘ BFD BFD ¸ Â **no** ¾ Â

bfd slow-timer [*milliseconds*]

no bfd slow-timer

ð Ô

milliseconds	(¬)BFD ˘ Æ й Â ¬ ÿ 1000 30000, й 1000 Â

ð Ô

й 1000ms

ð ¾ Ô

ð Ô

ð Ô

slow-timer й 14000 Â

```
Ruijie(config)# bfd slow-timer 14000
```

ð ¾Ô

¾	
bfd echo	BFD Echo ¶

ð ¼ Ô

54.1.6 ip ospf bfd

Ю **ip ospf bfd** ¾ OSPF б BFD ╠˘
disable ˘ **no** ¾ Â

ip ospf bfd [**disable**]

no ip ospf bfd

ð Ô

disable	(¼) Э OSPF б BFD ╠ Â

ð Ô

disableě й OSPF б BFD ╠

ð ¾ Ô

ð Ô

ч ¼Л OSPF б BFD ╠'
' OSPF Ю [**no**] **bfd all-interfaces** ¾
б BFD ╠'
у ' ¼Л **ip ospf bfd [disable]** ¾
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 ৡ Ô

ৡ	
bfd	BFD Â

```
Ruijie(config-if)# ip rip bfd disable
```

ð ¾Ô

¾	
bfd	BFD Â
bfd all-interfaces	б BFD ╟

ð ¼ Ô

54.1.8 ip route static bfd

Ю **ip route static bfd** ¾ б BFD ╟˘ **no** ¾ Â

ip route static bfd [**vrf** *vrf-name*] *interface-type interface-number gateway* [**source** *ip-address*]

no ip route static bfd [**vrf** *vrf-name*] *interface-type interface-number gateway* [**source** *ip-address*]

ð Ô

vrf *vrf-name*	(┘) VRF ┘ Â
interface-type *interface-number*	/ı Â
gateway	IP˘ й BFD IPÂ Ю й BFD ┘ Â
source *ip-address*	(┘) BFD IP , IP й Ю˘ Â

ð Ô

б BFD ╟

ð ¾ Ô

ð Ô

~ ˝I BFD

ð Ô

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
```

ð ¾Ô

¾	
bfd	BFD Â

ð ¼ Ô

54.1.10 vrrp bfd

Ю **vrrp bfd** VRRP Э BFD master ╟˘ **no** ¾ ╖ Â

vrrp *group-number* **bfd** *ip-addess*

no vrrp *group-number* **bfd** *ip-addess*

ð Ô

bfd up-dampening [milliseconds]

no bfd up-dampening

milliseconds	(৸) UP UP ˘ Æ ѝ Â৸ ÿ 0 300000, 0, ÿ DOWN↑ ѝ UP . ѝ 0Â

ѝ 0ms˘ ≠ ѝ Ơ UP

ৡ

Ю UP UP ѝ 60,000 .

Ruijie(config-if) bfd **up-dampening** 60000

ৡ

ৡ	
bfd	BFD Â

৸

ৡ ৸

৸	
10.3(5)	ৡ

54.2

BFD ЛьЮ ৡ'

- show bfd neighbors

54.2.1 show bfd neighbors

BFD

show bfd neighbors [**vrf** *vrf-name*

```
    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
```

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 ¾ Ô

¾	
-	-

ð ⁄ Ô

S3760 a BGP ⁄ BFD ╟

55 RLDP

55.1

RLDP ৻ ৻ à ৻ ৻ Â

৻ '

- rldp detect-interval
- rldp detect-max
- rldp enable
- rldp loop-detect enable

৻ '

55.1.1 rldp loop-detect enable

৻ ⁸ RLDP ╖ Â

rldp loop-detect enable

no rldp loop-detect enable

Â

৻ Â

RLDP ˘ RLDP Â

Ю '

```
Ruijie(config)# rldp loop-detect enable
```

৻	
rldp port	RLDP ╖

55.1.3 rldp detect-max

ʒ RLDP Э ˘
˘ ÿ ˘ ѝ Â

rldp detect-max *num*

no rldp detect-max

Â

¾ Â

RLDP ¬ ˘ RLDP ¬ Â

Ю '
Ruijie(config)# **rldp enable**

¾	
rldp port	RLDP ╖

¼

¼	
-	-

55.1.5 rldp loop-detect enable

¾ ⁸ RLDP ╖ Â

rldp loop-detect enable

no rldp loop-detect enable

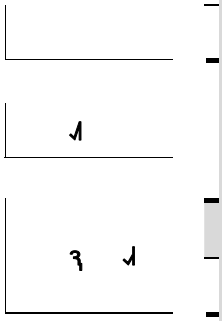
Â

¾ Â

RLDP ˘ RLDP Â

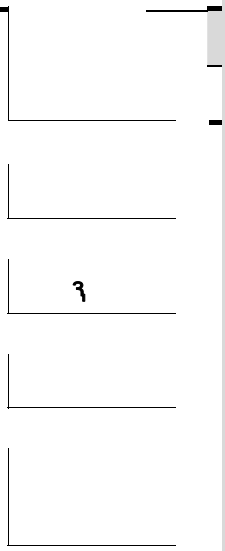
Ю '
Ruijie(config)# **rldp loop-detect enable**

RLDP



55.1.7 rldp re

rldp rese



55.2.1 show rldp

rldp Â

show rldp [**interface** *interface-id*]

Interface-id	

ৡ

ৡ	
-	-

ৗ

ৗ	
-	-

55.2.2 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

-	-

-	-

56 DLDP

56.1

DLDP ЛυЮ ȝ'

- dldp
- dldp passive
- clear dldp

56.1.1 dldp

DLDP ╖ Â ┘Л υ ȝ no IP DLDP ╖ Â

dldp *ip-address* [**next-hop** *ipv4-address*] [**interval** *tick* | **retry** *retry-num* | **resume** *resume-num*]

no dldp *ip-address*

ip-address	IP Â
Ipv4-address	˘ Лυ Ю IP Â
tick	˘ 5~6000ơ Æ и tickў з и 5 Âˆ 1tick= 10ms˜
retry-num	˘ 1~3600 Â
resume-num	˘ ÿ DOWN ┘ и UP ˘ DLDP ˘ 1~200 Â

Юў tick и 100tick=1sў retry-num и 3 ˘ resume-num и 3 Â

ȝ Â

ȝ ╟ DLDP ╖ ˘ ┘Л υ Лυ Â

1' 10.83.132.10 DLDP ╖ '

```
Ruijie#config
```

```
Ruijie(config)#interface vlan 1
Ruijie(config-if-VLAN 1)#ip address 10.83.132.1 255.255.255.0 //
    vlan1    IP
Ruijie(config-if-VLAN 1)#dldp 10.83.132.10
  2'                10.83.131.10    DLDP      ٦l  '
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 //
                 ЮO       IP
  3'            10.83.132.10    DLDP      ٦l  '
Ruijie#config
Ruijie(config)#interface vlan 1
Ruijie(config-if-VLAN 1)#no dldp 10.83.132.10
```

˘ ч DLDP˘ ч ICMP Echo ˘
Â ICMP Echo ˘ ʌ
ɹ ɹ ˘ ɹЛυ ч ˘
з ≠ CPU Â
ɹЛυ ў ╟ ICMP Echo й ў ╟ ˘ ╟ ICMP Echo
╟ Â

1' DLDP й ╟ '

```
Ruijie#config
Ruijie(config)#interface vlan 1
Ruijie(config-if-VLAN 1)#ip address 10.83.132.1 255.255.255.0 //
    vlan1   IP
Ruijie(config-if-VLAN 1)#dldp passive
```

ȝ	
-	-

ʃ 10.3(5)Лυ ʃ ˘ Â

ʃ	
-	-

56.2

DLDP ЛυЮ ȝ'

- show dldp

56.2.1 show dldp

DLDP Â

show dldp [**interface** *interface-name*] [**statistic**]

interface-name	Ь ɻ

ȝ

statistic Ь Э Â
Ь ɹ ˘ Л Ь Э Â

1'

Ruijie#**show dldp**

⅄	10.3(5)Л∪ ⅄ ˘ Â

३ ⅄	⅄	
	-	-

56.3

56.3.1 clear dldp

dldp up/down ˘
Â

clear dldp [**interface** *interface-name* [*ip-address*]]

interface-name	Ь ⅃
ip-address	IP

३

DLDP up/down ˘ ३ ⅃ Л∪
up/down ˘ з Â Ь IP ˘ ⅃ Л∪
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
```

३	३	
	-	-

⅄	10.3(5)Л∪ ⅄ ˘ Â

-	-

57 TPP

57.1

57.1.1 topology guard

ֽ Ю topology guard ֽ ╖
Â ֽ no ╖ Â

[**no**] **topology guard**

ð Ô

ð Ô

╖ ѝ

ð ֽ Ô

ֽ

ð Ô

╖ ˘ ┘Л Л┘ ˘ Л┘ ┘
Â б ֽ **cpu topology-limit** Â

ð Ô

Ю ╖ '

```
Ruijie(config)# topology guard
Ruijie(config)# no topology guard
```

ð ֽ Ô

tp-guard port enable ' ╖ Â

cpu topology-limit ' CPU

57.1.2 tp-guard port enable

╖ ˘ ֽ xs6Ñ.ßÑ

[

ð Ô

ð ʒ Ô

ʒ

ð Ô

Ћ Ћ˘ Ћ ˘
CPU è ˘
Â ʒ γ ˘ è (AP) a
ʒ Â

ð Ô

Ћ Ћ '

```
Ruijie(config-if)# tp-guard port enable
Ruijie(config-if)# no tp-guard port enable
```

ð ʒ Ô

topology guard ' Ћ

57.2 TPP

ð Ô

ð ʒ Ô

ð

Ruijie# **show tpp**

ð ৡ Ô

topology guard ' ╖

58

58.1

- **cd**
- **cp**
- **ls**
- **makefs**
- **mkdir**
- **mv**
- **pwd**
- **rm**
- **rmdir**

58.1.1 cd

cd *DIRECTORY*

ð Ô

DIRECTORY

ð Ô

Â

ð Ô

Â

ð Ô

Э ѝ ˘ è Э “..” ˘ “.”
˘ è ⅃Ո Æ ˘
Â ⅄ ⅃Ո ⅄ **ls** Â

ð Ô

Ю tmp ╟

```
Ruijie# cd tmp
```

ð Ô

ϡ	
ls	

58.1.2 cp

˚ , ˚ ˚ Â

cp dest {*DESTINE_FILE* | *DIRECTORY*} **sour** *SOURCE_FILE*

cp sour *SOURCE_FILE* **dest** {*DESTINE_FILE* | *DIRECTORY*}

ð Ô

DESTINE_FILE ˚

DIRECTORY 8 ˚

SOURCE_FILE 8 ˚ ɹ ( )

ð Ô

Â

ð ϡ Ô

Â

ð Ô

˚ ˚ ˘ ˚ ˘

Â

~

˘ **cp** ϡ a 8 Â

ð Ô

ЛЪЮ log.txt Э :

```
Ruijie# cp sour log.txt dest ../log_bak.txt
```

ð ϡ Ô

58.1.3 ls

Ю ˚ Â

ls *PATHNAME*

ð Ô

PATHNAME Ю Â

ð Ô

Ю Â

ð Ô

Â

ð Ô

Ю Ю Â

a .

ð Ô

Ю

```
Ruijie# ls
```

tmp Ю

```
Ruijie# ls tmp
```

ð Ô

58.1.4 makefs

makefs dev *DEVNAME* **fs** *FSNAME*

makefs fs *FSNAME* **dev** *DEVNAME*

ð Ô

DEVNAME ( )

FSNAME Э

ð Ô

Â

ð Ô

Â

ð Ô

Ю ' a à ÿ

Э

Л Л ' b à Л Л

Э Â

ð Ô

Ю ' jffs2 dev/mtdblock/1

Ruijie# **makefs dev** */dev/mtdblock/1* **fs** *jffs2*

ð Ô

58.1.5 mkdir

mkdir *DIRECTORY*

ð Ô

DIRECTORY

ð Ô

Â

ð Ô

Â

ð Ô

( ) Â

Э a Â

ð Ô

Ю test '

Ruijie# **mkdir** *test*

ð Ô

58.1.6 mv

mv sour *SOURCE_FILE* **dest** {*DESTINE_FILE* | *DIRECTORY*}

mv dest {*DESTINE_FILE* | *DIRECTORY*} **sour** *SOURCE_FILE*

ð Ô

SOURCE_FILE ╟ ˇ

DESTINE_FILE/DIRECTORY ˇ

ð Ô

Â

ð ϡ Ô

Â

ð Ô

ϡ Э ˘ ˇ Â
' a à (**type file**); b à '?' ╟
˘ a ж ˘ ┘Л '? ' ϡ
,Л ϡ Â

ð Ô

Ю log.txt ╟ Э , ┘ й config.txt, ┘ ┘
ˇ , ┘ ┘ ˇ '

```
Ruijie# mv sour tmp/log.txt dest ../config.txt
```

Ю log.txt ╟ tmp Ю'

```
Ruijie# mv dest /mnt/tmp sour tmp/log.txt
```

ð ϡ Ô

ϡ

58.1.7 pwd

pwd

ð Ô

pwd	

ð Ô

Â

ð ϡ Ô

Â

ð Ô

Æ Â

ð Ô

Ю Â

```
Ruijie# pwd
```

ð ϡ Ô

ϡ

58.1.8 rm

˚ Â

rm *FILE*

ð Ô

FILE ˚ ɻ( )

ð Ô

Â

ð ϡ Ô

Â

ð Ô

a , a ˚ ϳ ѡ Â ʌ ˘
ʌ ˘ a ˚ Â

ð Ô

Ю log.txt ˚ '

```
Ruijie# rm log.txt
```

ð ϡ Ô

ϡ	
rmdir	, ѝ ϡ , Ո rm ϡ ≠ ɻՈ

58.1.9 rmdir

59

59.1 CPU-LOG

ч ʒ'

- **show cpu**
- **cpu-log**

59.1.1 show cpu

CPU ˘ ʒ **show cpu** Â

show cpu

ð Ô

ð Ô

ð ʒ Ô

Â

ð Ô

ʒ ˩ Л CPU ˘ 5 à 1
ɬ à 5ɬ CPU ˘ Л Ь¦ 5
à 1ɬ à 5ɬ CPU Ὸ ص تجي ђ Ю

3	0%	0%	0%	atimer
4	0%	0%	0%	printk_task
5	0%	0%	0%	waitqueue_process
6	0%	0%	0%	tasklet_task
7	0%	0%	0%	kevents
8	0%	0%	0%	snmpd
9	0%	0%	0%	snmp_trapd
10	0%	0%	0%	mtdblock
11	0%	0%	0%	gc_task
12	0%	0%	0%	Context
13	0%	0%	0%	kswapd
14	0%	0%	0%	bdflush
15	0%	0%	0%	kupdate
16	0%	3%	1%	ll_mt
17	0%	0%	0%	ll main process
18	0%	0%	0%	bridge_relay
19	0%	0%	0%	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
```

```
 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 Ł˜ ÂЮ ɛ CPU ↑ Â è ˘ Ня Ю'

- No' /!
- 5Sec' Ł 5 CPU
- 1Min' Ł 1↑ CPU
- 5Min' Ł 5↑ CPU

2 ˘↑ LISR CPU HISR CPU ˘ ÿ 3 ˘ Ł CPU Â /! idle CPU ˘ Windows Ю Ї System Idle Process Ł ˘ Â Э ˘ idle 5 CPU ѝ 75%˜ CPU 75% Â

59.1.2 cpu-log

CPU , ┘ Л **cpu-log** Â

cpu-*log* *log-limit low_num high_num*

ð Ô

log-limit ʒ

low_num CPU æ

high_num CPU

ð Ô

Ю й 100%˜ æ й 90% Â

ð ৡ Ô

Â

ð Ô

ৡ ৶ Л CPU æ ˘

ð Ô

ð Ô

ð Ô

Â

ð Ô

ˇ

ˇ Ћ à Â

ð Ô

Ю **show memory** Â

```
Ruijie#show memory
System Memory Statistic:
```

32cd54192>

59.2.2 memory-lack exit-policy

worsen

ʒ ´ Â

show memory protocols

ò Ô

ò ʒ Ô

ò Ô

ʒ ´ Â

a ⊿ a ⊿˘ ў
BGP,OSPF,RIP,LDP,PIM,ISIS Â

ò Ô

1' Ю й show memory protocols

```
Ruijie(config)# show memory protocols
==================================================
```

59.3.1.1 threshold set

ˇ ˩ 3 ˇ ˦ ѝ CPU ȁ
ȁ Â CPU ˇ ў
MIB ˩ˇ CPU ˇ syslog Â ˇ
ˇ ˇ syslog Â

˩ **no** Â

2' γ /ι CPU Â

Ruijie(config)# **threshold set cpu member 2 70 90**

ð ϡ Ô

ϡ	
show threshold	ϡ

ð ✓ Ô

S3760 a

59.3.2

ЛЬЮ ϡ'

- show threshold

59.3.2.1 show threshold

Â

show threshold {cpu | memory | temperature} [M1 | M2 | slot *n* | member *n*]

ð Ô

**cpu	memory	temperature**	˘ Ь ˘ **cpu** ϊ CPU ˘ **memory** ϊ ˘ **temperature** ϊ
**M1	M2	slot** *n*	Æ˘ Э ˘ *n* ϊ ´ /ι˘ Æ
member *n*	˘ Э ˘ *n* ϊ /ι˘

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**

threshold set	

S3760 a

60

60.1

60.1.1 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 ⅃Л Console à VTY Э˘ ≠ ⅃Л
a ⅄ Э' ă ʁ à FLASH à Syslog Server Â ⅋ и
˘ ˘ a ˘ ш и
1 Log Â

ð Ô

Ю Э '

```
Ruijie(config)# no logging on
```

ð ⅋ Ô

⅋	
logging buffered	ă ʁ
logging	Syslog Server
logging file flash:	FLASH Э
logging console	⁸ ⅄ Э

logging monitor	VTY (telnet) Э
logging trap	Syslog Server

60.1.2 terminal monitor

ʒ VTY Э Â VTY Э ˘ ʒ no Â

terminal monitor

terminal no monitor

ð Ô

Ю˝ VTY Э a VTY Э Â

ð ʒ Ô

ð Ô

ʒ VTY Â ѝ ˘ a Â VTY ˅˘ Â

🕮

ѝ ˘ RGOS ⁸ ˅ Э ʒ Â ⁸ ˅ Э ʒ no , ш ѝ Ơ 1 Â

ð Ô

Ю ˘ VTY Â

```
Ruijie# terminal monitor
Ruijie#
```

60.1.3 logging buffered

no Ì ˄ ώ ă ѫ

60.gjm3(fered)]?ЫCmoЫ?Ы/

ð Ô

buffer-size ' ă ʁ ˘ ɻ ÿ 4K 128K Bytes Â

levell ' ш ˘ ÿ 0 7 Â ɻ Л ɻ ˘ ≠ ɻ Л Â

ð Ô

ă ʁ й 4k Bytes Â

ш й 7 Â

ð ϧ Ô

ð Ô

ă ʁ ˘ ʁ ˘

Â ă ʁ ˘ ϧ **show logging Â**

ă ʁ ˘ ϧ clear

logging˘ ă ʁ Â ˘ FLASH

Ĝ ḫ ض

Ruijie(config)# **logging server ipv6** *AAAA:BBBB::FFFF*

ш Л Л˘ Э æ ш
⁸ Л Э Â

show logging ֽ Л Л Â

ð Ô

Ю ⁸ Л й б'

```
Ruijie(config)# logging console informational
```

ð ֽ Ô

ֽ	
logging on	
show logging	ă ѡ ˘ Л

60.1.7 logging monitor

VTY ^ telnet à SSH ~ Э ˘
Ю ֽ Â ֽ no VTY Э Â

logging monitor *level*

no logging monitor

ð Ô

level ' ш Â Л Л ɹ ˘ ≠ Л Л Â
ш ˘ 1 Â

ð Ô

Debugging (7)

ð ֽ Ô

ð Ô

VTY Э ˘ ″I ֽ **terminal monitor**
VTY Â **logging monitor**
Ⱨ Â

Logging monitor Ⱨ VTY Â

ð Ô

Ю VTY Э ѝ 6ѓ

```
Ruijie(config)# logging monitor informational
```

ð ꝛ Ô

ꝛ	
logging on	
show logging	ă ѡ ˘ Л

60.1.8 logging trap

Syslog Server ˘ Ю
ꝛ Â ꝛ no Syslog Server Â

logging trap *level*

no logging trap

ð Ô

level ' ш Â ⅃ Л *ɹ* ˘ ≠ ⅃ Л Â
ш ˘ 1 Â

ð Ô

Informational(6)

ð ꝛ Ô

ð Ô

Syslog Serverˇ ˝I ꝛ logging Syslog
Server Â ɹˇ logging trap ш Â

show logging ꝛ ⅃ Л Â

ð Ô

Ю ѝ 6 ѝ 202.101.11.22 Syslog
Serverѓ

```
Ruijie(config)# logging 202.101.11.22
Ruijie(config)# logging trap informational
```

ð ꝛ Ô

ȝ	
logging on	
logging	Syslog Server
show logging	ă ʁ ˘ Л

60.1.9 logging source interface

˘ Ю ȝ Â ȝ no ˩ Â

logging source interface *interface-type interface-number*

no logging source interface

ð Ô

interface-type '

interface-number ' /ǀ

ð Ô

ð ȝ Ô

ð Ô

Ю˘ Syslog Server Â ˣ ˘ ˩ Л ȝ ˣ ˘ ÿ ˩ Â

ð Ô

Ю Loopback 0 ˣ Syslog '

```
Ruijie(config)# logging source interface loopback 0
```

ð ȝ Ô

ȝ	
logging	Syslog Server

60.1.10 logging source ip| ipv6

˘ Ю ҷ Â ҷ no ↓
Â

logging source {**ip** *ip-address* | **ipv6** *ipv6-address*}

no logging source {**ip** | **ipv6**}

ð Ô

ip-address IPV4 ў IPV4 ’

ipv6-address IPV6 ў IPV6 ’

ð Ô

ð ҷ Ô

ð Ô

Ю˘ Syslog Server Â и
˘ ↓Л ҷ и ˘
ÿ ↓ Â

ð Ô

Ю Loopback 0 и Syslog '

```
Ruijie(config)# logging source ip 192.168.1.1
```

ð ҷ Ô

ҷ	
logging	Syslog server

60.1.11 logging facility

˘ Ю ҷ Â ҷ no ˘
и (23) Â

logging facility *facility-type*

no logging facility

ð Ô

facility-type ' Syslog ˘ é Â

ð Ô

Local7(23)

ð Ô

ð Ô

ÞO ˆ 2˜ Syslog ˩ '

2

Numerical Code	Facility
0	kernel messages
1	user-level messages
2	mail system
3	system daemons
4	security/authorization messages
5	messages generated internally by syslogd
6	line printer subsystem
7	network news subsystem
8	UUCP subsystem
9	clock daemon
10	security/authorization messages
11	FTP daemon

12	NTP subsystem
13	log audit
14	log alert
15	clock daemon
16	local use 0 (local0)
17	local use 1 (local1)
18	local use 2 (local2)
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 ʒ Ô

ʒ	
logging console	⁸ Л Э

60.1.12 logging count

Ю ʒ Â

ʒ no Â

logging count

no logging count

ð Ô

ð Ô

ð ϡ Ô

ð Ô

ϡ ˘ ˘ 3 Â

no logging count ϡ Â Â ÿ ϡ ϡ

ð Ô

ϡ '

```
Ruijie(config)# logging count
```

ð ϡ Ô

ϡ	
show logging count	
show logging	б ă ш

60.1.13 logging rate-limit

8 ˘ 8 ˘ Ю

ϡ Â 8 ˘ ϡ no Â

logging rate-limit {*number* | *all number* | *console* {*number* | *all number*}} [*except severity*]

no logging rate-limit

ð Ô

number

except ш ˘ a ⁸' й error(3)˘
error a ⁸'

severity ш ˘ ˘ ш ˘ й 0—7;

ð Ô

Ю˘ a ⁸ Â

ð ʒ Ô

ð Ô

ʒ ⁸ Â ʒ˘ ⅂ Л∪ Â

ð Ô

ˆ debug˜ й 10 ˘ warning
ш a ⁸'

╗ Э Л˘ ˇ ↓Л ╗ Э Л˘ Л ÿ 1
Â ╗ Э Л Л Л˘ ↓Л ˇ Л
″I Л Â

ð Ô

Ю ╗ Э Л'

```
Ruijie(config)# service sequence-numbers
```

ð ϡ Ô

ϡ	
logging on	
service timestamps	

60.1.16 service timestamps

╗ Э ˇ Ю ϡ Â ϡ no
↓ Э Âdefault й
Â

service timestamps *message-type* [*uptime* | *datetime* [*msec* | *year*]]

no service timestamps *message-type*

default service timestamps *message-type*

ð Ô

message-type ' ˇ ч log debug Âlog ш 0
· 6 ˇ debug ш й 7 Â

uptime′ ╠ ˇ ' * * *¶ * ˇ ' 07:00:10:41

datetime' ˇ ' ' ¶ ' ˇ ' Jul 27 16:53:07

msec ˇ ' :¶ : . ' Jul 27 16:53:07.299

year ˇ ' :¶ : ' 2007 Jul 27 16:53:07

ð Ô

ˇ й Â RTC˘ ╠ й
╠ 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 ʒ Ô

ð Ô

Ю ╕ Э ɻ'

```
Mar 22 15:28:02 %SYS-5-CONFIG: Configured from console by
console
Ruijie# config terminal
Enter configuration commands, one per line. End with CNTL/Z.
Ruijie(config)# service sysname
Ruijie(config)# end
Ruijie#
Mar 22 15:35:57 S3250 %SYS-5-CONFIG: Configured from console
by console
```

ð ϡ Ô

ϡ	
show logging	б ă ш

60.1.18 more flash

FLASH ˚ ˘ Ю ϡ'

more flash:filename

ð Ô

Filename ' ˚ ɻ

ϡ	
logging file flash:	FLASH Э

60.1.19 clear logging

ă ш ˘ Ю ϡ Â

clear logging

ð ϡ Ô

ð Ô

ϡ ă ш Â a Â

ð Ô

Ю ă ш Â

```
Ruijie# clear logging
```

ð ϡ Ô

ϡ	
logging on	
show logging	ă ш
logging buffered	ă ш

60.2

ð ৡ Ô

Console logging	˸ Ѧ Ϟ ˸ Ѧ
Monitor logging	VTY Ϟ ˸ Ѧ
Buffer logging	ă ѫ ˸ Ѧ
Timestamp debug messages	Debug
Timestamp log messages	Log
Sequence log messages	ѧ
Trap logging	Syslog Server ˸ Ѧ
Log Buffer	ă ѫ

ð ϡ Ô

ϡ	
logging on	

clear logging	ă ш

60.2.2 show logging count

˘ Л∪ л ˘

Ю ђ Â

show logging count

ð Ô

ð ђ Ô

ð Ô

й ╖ ˘ Ю˘ **logging count** ђ Â
show logging count ђ˘ ┘Л∪ ˘ ˘ л
Â

show logging ђ˘ ┘Л∪ ╖ Â

ð Ô

Ю **show logging count** '

```
Ruijie# show logging count
Module Name   Message Name Sev Occur     Last Time
==================================================SYS
CONFIG_I        5   1        Jul 6 10:29:57
--------------------------------------------------SYS
TOTAL                        1
```

ð ђ Ô

ђ	
logging count	╖
show logging	б ă ш
clear logging	ă ш

60.2.3 show logging reverse

ʒ ╖ б **show logging**

	ă ʁ
	б ă ʁ