RG-S8600

IPv6

RGOS 10.4(2b3)

(4 1J ÊQr£3RS)4)HdxB I3v3Ï@t

Ὼ ∧ ©2000-2010

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[ ] ' [ ] ǂ ˘ ҳ ┘ Â

{ x | y | ... }' ÿ ч ┘ Â

[x | y | ...]' ÿ ч ┘ a Â

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1 CLI

1.1

mode	
command-alias	
original-command	

EXEC

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

a **no alias exec**

alias ?

```
Ruijie(config)# alias ?
aaa-gs                  AAA server group mode
bgp                      Configure bgp Protoco
config                  globle configure mode
*command-alias=original-command"  "show"
```

```
Ruijie# s?
*s=show  show  start-chat  start-terminal-service
Ruijie# s?
*s=show  *sv="show version" show  start-chat
start-terminal-service
Ruijie# s?
show  start-chat  start-terminal-service
Ruijie(config-if)# ia ?
A.B.C.D  IP address
dhcp     IP Address via DHCP
Ruijie(config-if)# ip address
```

show aliases

```
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
```

show aliases	

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1.1.2 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*

mode	¦ CLI ¦ Â
[**all**]	¦ ¦ ˘ ˩ и ˩ Â
level *level*	¦ ¦ ˘ 0-15 Â
reset	¦ и Â
command-string	¦ Â

¦

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

ЛЮ ˘ CLI 1 ¦ и ”test”˘ **reload** ¦ ˘ ˩ Л∪ Æ Â

```
Ruijie(config)# enable secret level 1 0 test
Ruijie(config)# privilege exec level 1 reload
   ˘        1    CLI   ˘     ⅃Ⅱ    reload   ⅋'
Ruijie> reload ?
<cr>
```

reload ⅋ 1 ˘ ‡ ⅃Ⅱ **all** '

```
Ruijie(config)# privilege exec all level 1 reload
   ˘        1    CLI   ˘     ⅃Ⅱ    reload        ⅋'
Ruijie> reload ?
```

ЛЬЮ ˘ EXEC Ю ३ ⅃'

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

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३	
alias	३ ⅃

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2

2.1

2.1.1 disable

Ю æ ˘ ч disable Â

disable [*privilege-level*]

privilege-level	

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æ Â

&	**disable** ч Л Â

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```
Ruijie# disable 10
```

enable	ÿ ˘ Â

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2.1.2 enable

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2.1.3 enable password

a ৶ ৡˇ ৡ **enable password** Â ৡ **no** ৡ Â

enable password [**level** *level*] {*password* | [**0** | **7**] *encrypted-password*}**no enable password**

Password	EXEC ৡ Â
Level	Â
0|7	ৡ ╗ ˇ 0 ╗ ˇ 7 ╗ Â
encrypted-password	ৡ Â

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╗ Â
ʒ ЊЖ ЮЎ
Â 1 26 Â
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╗ ˘ Л ʒˇ ‡ a
EXEC Â a ╗ ʒ Â ɻ
ʒ Â

ЮЎ ʒ ѝ pw10Ў

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

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enable secret	ʒ Â

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2.1.4 enable secret

a ɻ ʒˇ ʒ **enable secret** Â ʒ **no** ʒ Â

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

no enable secret

Secret	EXEC ʒ Â
Level	Â
0|5	ʒ ╗ ˘ 0 ╗ ˘ 5 ╗ Â
encrypted-password	ʒ Â

ʒ

ʒ б Ł Â **no enable service** ʒ Ł Â

Ю ʒ’ enable service ssh-sesrver, SSH Server ╖ '

```
Ruijie(Config˜ # enable service ssh-sesrver
```

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Telnet

```
configure terminal
line tty 1 16
```

enable Â

Web Â **no ip http authentication**
Â

Web local
```
Ruijie(config)# ip http authentication local
```


enable service

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2.1.9 ip telnet source-interface

Э IP й Telnet ˘ Ю˘ ᴝ Л Ъ **ip telnet source-interface** ʒ'

ip telnet source-interface *interface-name*

interface-name	Э IP й Telnet Â

ʒ

ʒ Э IP й Telnet Â telnet ʒ ᴓ Telnet Ь ˘ й ˘ Â **no ip telnet source-interface** ʒ й Â

Ю ʒ˘ Loopback 1 Э IP й Telnet '

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

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telnet	ᴓ Telnet Ь Â

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10.4(2)	ʒ

2.1.10 lock

Э EXEC **lock**Â

lock

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Ъ ˘ ˇ в ЛЮ Â
ЛЮЮ в '
Â ' **lock** Ъ˘ Ъ'
Â γ ' Ъ˘ ˇЛЮ Â Л˘ Ъ˘
Л˘ ˘ Ґ Locked Ł '
Â ˘ Ъ Â
Э в ˘ line Ю **lockable** Ъ˘
line Э в Â

Ю й в '

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

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lockable	Э в Â

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2.1.11 lockable

Э **lock** ˇ Л Ц line Ю **lockable** ˇ
Ю a **lock** Â **no** л Â

lockable

no lockable

-	-

line

Э в ˇ в Л Ц EXEC Ю
lock Â

Ю ⁸ Л Э в ˇ в ⁸ Л'

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

lock	в Â

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login

no login

-	-

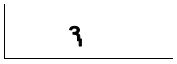
line

AAA VTY console

Ю VTY Э

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

password	line



line

username ϡ Â

Ю VTY Э Â

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

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username	Â

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2.1.15 privilege mode

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ê CLI ϡ Ì Â

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2.1.16 password

line ¸ line ¸ **password** Â ¸ **no** line ¸ Â

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

no password

password	line ¸ Â

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ʒ ⅄ Session Ŀ ^ Session Ŀ ⅃ Ʌ Э ⅄
⅄ ⅄ Э ˘ è Session Ŀ ´ ~ Â
⅄ ‡ ǹ Â
⅄ a ˘ Э ´ a Session Ŀ ˘ ‡ Â
ℸ Ʌ ⅄˘ ´ ʒ ˘ ⅃ Ʌ exit ʒ Â

ÿ ⅄ ´ ^ ~ ⅄ ⅄ ´
Э˘ ‡ ч ⅄ ″I VSU˙ ч ⅄ Э ⁋
VSU ˘ з ў Э ў ч ⅄ ~ ,

1' Ю ˘ ÿ S86 M1 M2 ,

```
Ruijie# session slot m2
```

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exit	,

⅄ 10.4(2b3) Э S86

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10.4(2b3)	ʒ

2.1.19 telnet

⅄ Telnet Ŀ ˘ EXEC˘ ~ Ю˘ **telnet** ʒ Â

telnet *host* [*port*] [**/source** {**ip** *A.B.C.D* **| ipv6** *X:X:X:X::X* **| interface** *interface-name}*] [**/vrf** *vrf-name*]

Host	Telnet Ŀ IPV4 à IPV6 ў ⅃
Port	Telnet Ŀ TCP ⅄˘ ǹ 23
/source	Telnet IP
ip *A.B.C.D*	Telnet IPV4

/vrf *vrf-name*	VRF

0|7	Â
encrypted-password	Â
privilege-level	Â

Â

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

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login local	Â

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2.2

2.2.1 banner login

Ю Â **banner login** Â

no banner login Â

banner login *c message c*

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c	a
message	

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2.2.2 banner motd

˘ Ю ʒ **banner motd** Â ٧

˘ **no banner motd** ʒ Â

banner motd *c message c*

	86 442.1.9603 Tm<09961B44>Tj/TT1 1 Tf0 Tc 0 T 5B44>Tj 442.

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

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2.2.3 boot system

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boot system url

no boot system

url	˚ Â

Ґ' ɻ ў ˚ ɹ ѝ flash:/rgos.bin Â Ł

Â

ʒ ɻ Лυ ѝ ў ɹ Â url ˚ Â ╖ ɻ Лυ a ɻ ˚ ґ Â

1 à ʒ flash URLˇ ɻ flash Э ˚ ѝ ╟ ˚ ɹ Â

2 à ʒ ˇ Boot ROM ˚ Â

ЛυЮ ў ɹ a ɻ ˚ ґ Â

```
Ruijie#show boot system
system boot file: flash:/rgos.bin
```

```
Ruijie#dir
Directory of flash:/
   11015744 2008-01-01 08:00:46  rgos.bin
   12019754 2008-02-01 08:00:46  s5750_10_4.bin
       399 2006-01-01 08:01:37  config.text
33,030,144 bytes total. (10,590,592 bytes free)

Ruijie(config)# boot system s5750_10_4.bin
Ruijie(config)# show boot system
system boot file: flash:/ s5750_10_4.bin
          ╟     ˘          s5750_10_4.bin    Â
```

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show boot system	Â

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2.2.4 clock set

˘ ʌ ʃ ʊ ʒ **clock set** ч '

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

hh:mm:ss	˘ й ˆ 24 ⁸ ˜ : ˛ :
day	ˆ 1-31˜ ˘ Â
month	ˆ 1-12˜ ˘

ʒ ˘ Â

˚ ˘ clock set Э

˘ Ю Л˘ Â

Ю й 2003 3 17 Э ' 10 20¦ 30 '

```
Ruijie# clock set 10:20:30 3 17 2003
Ruijie# show clock
clock: 2003-3-17 10:20:32
```

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2.2.6 exec-timeout

LINE Ю ˘ **exec-timeout** ϟ Â **no exec-timeout** ϟ˘ ϻ LINE Ю ˘ a Â

exec-timeout *minutes* [*seconds*]

no exec-timeout

minutes	ǂ ’
seconds	ˆ ˩ ~ ’

ϧ 10 min Â

ϟ LINE

˘ ˘ ˘ LINE ϧ ˩ Â

Ю line vty 0 ϧ 5ǂ 30 ’

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

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2.2.7 hostname

ў ɹ˘ ϧ **hostname** Â

hostname *name*

name	ў ɹ˘ ϰ à Л Â ѝ 32 Â

ў ɹ ѝ Ruijie Â

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Ю 10ᚴ Л ⅄ '

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

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2.2.11 speed

ˇ ЮЎ ʒ **speed** *speed* Â
ˇ **no speed** ʒ Â

speed *speed*

Speed	ˇ Æ bps Â ˇ ˬ ѝ 9600 ă19200 ă38400 ă57600 ă 115200 ˇ 9600 Â

9600

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ЮЎ ѝ 57600 bps'
```
Ruijie(config)# line console 0
Ruijie(config-line)# speed 57600
```

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2.2.12 write

ˆ running-config˜ Æ Â

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

memory	NVRAM˝ ˩ **copy running-config startup-config** Â
network	TFTP Ł Э˘ ˩ **copy running-config tftp** Â
terminal	˘ ˩ **show running-config** Â

Â

1' ЛЬЮ a **boot config** Э '

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

2' ЛЬЮ **boot config** Э ╠ ˚ й U Э ˚ Л˘ U Л **write** a ˩ й'

```
Ruijie(config)# boot config /mnt/usb1/config.text
Ruijie# write
Building configuration...
Write to boot config file: [/mnt/usb1/config.text]
[OK]
Ruijie# usb remove 1
0:1:1:38 Ruijie: USB-5-USB_DISK_REMOVED: USB Device <USB Mass
Storage Device> Removed!
Ruijie# write
Building configuration...
Write to boot config file: [/mnt/usb1/config.text]
[Failed]
The device [usb1] does not exist, write to the default config file
[/config.text]? [no] yes
Write to the default config file: [/config.text]
[OK]
```

boot config	
copy	
show running-config	

-	-

2.3

2.3.1 show clock

show clock

show clock

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Ruijie# **show clock**
clock: 2003-3-17 10:27:21

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2.3.3 show reload

ǁ ˘ Ю ϡ **show reload** Â

show reload

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Ю ǁ '

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

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2.3.4 show running-config

show running-config

show running-config

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2.3.5 show startup-config

NVRAM

NVRAM startup-config

startup-config Flash /config.text

```
System software version: RGOS 10.3.00(4), Release(34679)
System boot version: 10.2.34077
System CTRL version: 10.2.24136
System serial number: 1234942570001
```

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3.1.2 exec

ৡ ┘Л∪ ৡ (EXEC)˘ è no ‡ ╖ Â

exec

no exec

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LINE ˘ ЛЪЮ ३'

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

-	-

Ю˝ ┘ VTY й 5˝ /Ґ й 0--4 Â

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╗ ┘ VTY ˘ ┘Л Э ¦ Â

1' ┘ VTY ╗ 20˝ ┘ VTY /Ґ й 0--19 Â

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

2' ┘ VTY 10˝ ┘ VTY /Ґ й 0—9 Â

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

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/Ґ	
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3.1.5 transport input

Line Ю ┘Л ˘ **transport input** ¦ Line Ю ┘Л Â
default transport input й LINE Ю й Â

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

default transport input

all	Line Ю˝ Â
ssh	Line Ю˝ ┘ SSH Â
telnet	Line Ю˝ ┘ Telnet Â
none	Line Ю˝ a Â

˘ VTY Â è TTY й NONE˝ a
Â ¬Л Л˘ ¬Л Л **default transport input**
¾ й Â

¾ Line

¾ Line Ю ÂVTY Ю˝ Â
Л˘ ¬ ¬Л VTY Э ╖ Â **show**
running ¾ Line Ю Â

	d**efault transport inpu**t ¾ Â **no transport**
&	**input** ¾˘ LINE Ю Â б
	transport input none ¬ Â

line vty 0 4 Ю˝ ¬ telnet '

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

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4 ISSU

4.1

4.1.1 issu abortversion

issu abortversion [**{M2|M1}** *image*]

{**M1|M2**}	ў Л
image	ў Э

a ˘ ЈЛ ђ Â
a Â

1' LOADVERSION RUNVERSION Ю

```
Ruijie# issu abortversion M2 flash:install-s86-new.bin_
or
Ruijie# issu abortversion
```

ђ

show issu state [detail]show1.677 0.00<1DB9E>-F<17EA>Tj/TT0 1 Tf94 0025 Tc 1.252 0 is u(SION

4.1.3 issu commitversion

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issu commitversion {M2|M1} *image*

{M1|M2}	⁋ Л ÿ Л
image	⁋ Л ÿ Э ˚

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ৡ Л˘ ISSU ˘ a

1' ў ˘ ÿ

```
Ruijie# issu commitversion M1 flash:install-s86-new.bin_
```

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show issu state [detail]	issu
show redundancy states	

Л ৡ S8600 Э

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10.4	ৡ

4.1.4 issu loadversion

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issu loadversion {M1|M2} *active-image* **{M2|M1}** *standby-image [force]*

4.1.5 issu runversion

ʒ ў ΄ ˚ ÿ Э˘
˚ Э

issu runversion {M2|M1} *image*

4.1.6 issu set rollback-timer

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issu set rollback-timer {*seconds*| *hh:mm:ss}*

no issu set rollback-timer

seconds	Л∪
hh:mm:ss	Л∪ ' ⅈ '
no	No

2700 (45ⅈ)

⅋

1' й 1 10ⅈ

```
Ruijie# issu set rollback-timer 01:10:00

Ruijie# issu set rollback-timer 4200
```

⅋	
show issu state [detail]	issu
show rollback-timer	

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10.4	⅋

4.2

4.2.1 show issu rollback-timer

Show issu rollback-timer

й 45†

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1' Ю ISSU '

```
Ruijie# show issu rollback-timer
Rollback Process State = IN progress
Configured Rollback Time = 45:00
Automatic Rollback Time = 39:00
```

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Issu set rollback-timer	

٨ ٦ S8600 Э

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10.4	٦

4.2.2 show issu state

ISSU

show issu state [detail]

detail	↓ ˘ ў ÿ Э

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1' Ю ISSU '

```
 Ruijie# show issu state detail
                 Slot = M1
               RP State = Active
             ISSU State = Init
          Boot Variable = flash:/rgos.bin

                 Slot = M2
               RP State = Standby
             ISSU State = Init
       Boot Variable = flash:/rgos.bin
```

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Issu abortversion	˘
Issu acceptverion	
Issu commitversion	↓ ˘ ч
Issu loadverion	ÿ
Issu runverion	ў ÿ

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↓ ʒ S8600 Э

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5

5.1

5.1.1 ping

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

é DNS ¦ Â

1' 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
```

2' 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
```

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length	
times	
seconds	
data	
source	IPv6 ::1

5

Ping ipv6 ping ipv6 ping ipv6 ping ipv6 IP ping ipv6 DNS

6

1 ping ipv6

```
Ruijie# ping ipv6 2000::1
Sending 5, 100-byte ICMP Echoes to 2000::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
```

2 ping

```
Ruijie# ping  ipv6 2000::1 length 1500 ntimes 100 timeout 3 data ffff
source 2000::2
 Sending 100, 1000-byte ICMP Echoes to 2000::1, 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
```

7

	-	-

⊿	ϧ	ipv6 Э Â

ϧ	⊿	
	-	-

5.1.3 traceroute

traceroute ϧˇ ⊣ Л∪ ÿ .

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

vrf-name	VRF ⊿
Ip-address	IPv4 Â
number	
source	IPv4 Â ὲ ˇ ˆ 127.0.0.1 ϟ ϟ

```
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
```

ヲ	
-	-

ﾉ -

ﾉ	
-	-

Traceroute ipv6 ў DNS

ЛЬЮ й traceroute ipv6 ч й й

a Â

1' traceroute ipv6 '

```
Ruijie# traceroute ipv6 3004::1
 < press Ctrl+C to break >
Tracing the route to 3004::1
1     3000::1        0 msec  0 msec  0 msec
2     3001::1        4 msec  4 msec 4 msec
3     3002::1        8 msec  8 msec  4 msec
4     3004::1        4 msec  28 msec  12 msec
```

ў Э Л Лu ў IP й *3004::1* ў

Â

2' a traceroute ipv6 '

```
Ruijie# traceroute ipv6 3004::1
 < press Ctrl+C to break >
Tracing the route to 3004::1
1     3000::1        0 msec  0 msec  0 msec
2     3001::1        4 msec  4 msec 4 msec
3     3002::1        8 msec  8 msec  4 msec
4     * * *
5     3004::1        4 msec  28 msec  12 msec
```

ў Э Л Лu ў IP й *3004::1* ў

з 4 Â

-	-

-	-

6

6.1

6.1.1 carrier-delay

HO ३ **carrier-delay** ˘ ३ **no**
Â

carrier-delay [*seconds*]

no carrier-delay

-	-

6.1.2 clear counters

clear counters [*interface-id*]

interface-id	/ʅ Â

ʒ Â

ɻ ɅƱ ʒ **show interfaces** ˘ Ю **clear counters** ʒ˘ ɻ ɅƱ Â a ˘ ‡ Â

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

ʒ	

ৡ

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

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

ৡ

ʃ

ʒ	ʃ	
	-	-

6.1.5 duplex

Ю ʒ ʃ Â ʒ **no**
й Â

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

no duplex

auto	ʃ ʃ Â
full	ʃ Â
half	ʃ Â

ʃ ʃ Â

ʒ

ʃ б Â ʃ Л **show interfaces** ʒ ʃ
Â

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

ʒ	
show interfaces	Â

ʃ

ʃ	
-	-

6.1.6 flowcontrol

ʒ ⁸ Â ʒ no ѝ Â

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

no flowcontrol

auto	⁸ Â
off	⁸ Â
on	⁸ Â

⁸ Â

ʒ

show interfaces ⁸ ⁸ Â

ˇl Л∪ 1/1 ⁸'

```
Ruijie(config)#
```

ৡ

ৢ Л∪ ‡˘ è ╗ aggregate port Âaggregate port
϶ ˘ aggregate port ¤ Â **show interfaces** **show interfaces aggregateport** ৡ Â

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

ৡ

ৡ	
show interfaves	Â

S8600
Â 8
Â … 128 AP

ৡ

Л	
-(Td(	)TjET66.8 2.04EfB32 Tr

Ruijie(config-if)#

ʒ	
show interfaces	Â

Л	
-	-

6.1.9 interface giagbitEthernet

ʒ ʒˇ ¨l Л∪ ˇ Â

interface gigabitEthernet *mod-num/port-num*

mod-num/port-num	Л / Э Лˇ ¤ Â

ʒ

ʒ **no** ˇ a Â **show interfaces** **show interfaces gigabitEthernet** ʒ Â

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

ʒ	
show interfaces	Â

Л	
-	-

6.1.10 interface tenGigabitEthernet

10G

interface tenGigabitEthernet *mod-num/port-num*

mod-num/port-num	/

no a **show interfaces** **show interfaces tenGigabitEthernet**

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

show interfaces	

ï

show interfaces **show interfaces vlan** ï Â

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

ï

[redacted]	
show interfaces	Â

S8600 '

Â … 2K SVI

Â 2K IP

```
Interface : GigabitEthernet 0/1
start cable-diagnoses,please wait...
cable-daignoses end!this is result:
4 pairs
pair state     length(meters)
---- ---------- --------------
A    Ok        1
pair state     length(meters)
---- ---------- --------------
B    Ok        2
pair state     length(meters)
---- ---------- --------------
C    Short     1
pair state     length(meters)
---- ---------- --------------
D    Short     1
```


pairs

6.1.13 medium-type

Â ϡ **no** Â

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

no medium-type

fiber	˝I
copper	

Â

ϡ ˆ ˘ a Ap SVI˜

˩ ˩Л ˝I ч ˘ ˩ è Â
Л˘ ˘ à˩ à ⁸ ˘
Â ˩ Л˘ ѝ è ˘ ˩Л
Â

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

ϡ	

num	64 9216(65536 a a)

ѝ 1500 Â

mtu Â

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

show interfaces	Â

-	-

6.1.15 shutdown

Â **no** Â

shutdown

no shutdown

-	-

Л à Ap à SVI Ÿ

a Ÿ

1' Ap 1'

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

2' Ap 1'

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

ȝ

ȝ	
clear interface	˚ Æ Â
show interfaces	Â

ȷ

ȝ

ȷ	
-	-

6.1.16 snmp trap link-status

ȷ Ƚ LinkTrap˘ ȶ ˘ Link ȷ ˘ SNMP LinkTrap, ȷ ‡ a Â ȝ **no** SNMP a LinkTrap Â

snmp trap link-status

no snmp trap link-status

Ю˘ ȶ ˘ Link ȷ ˘ SNMP LinkTrap Â

ȝ Â

ˆ Ƚ à Ap à SVI ~ ˘ ȝ LinkTrap˘ ȶ ˘ Link ȷ ˘ SNMP LinkTrap, ȷ ‡ a Â

1' Ю ù a Link trap'

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

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

2' Ю ѝ Link trap'

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

Ruijie(config-if)# **snmp trap link-status**

ϡ	
Ruijie(config-if)# **snmp trap link-status**	link trap ℡ Â
Ruijie(config-if)# **no snmp trap link-status**	link trap ℡ Â

Л
-

Л	
-	-

6.1.17 speed

Â ϡ **no**

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

Â

ϡ

Ap ˘ ‡ Ap ᾱ ˘ ˩Л υ ˘
a Â Ap Â **show interfaces** ϡ Â
a ˩˘ ≠ a ˩ Â ˘ SFP a
ѝ 10M 100M Â

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

Ruijie(config-if)# **speed** *100*

३	

6.1.19 switchport access

ý ý **access port** ý VLAN Â
ý no VLAN Â

switchport access vlan *vlan-id*

no switchport access vlan

vlan-id	╗ VLAN ID Â

switch port ý access VLAN ý VLAN 1

ý

VLAN ID Â VLAN ID ‡ … VLAN
ý VLAN Â VLAN ID ‡ ╗ VLAN
Â trunkport ‡ Â

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

ý	

switchport mode {**access | trunk**}

no switchport mode

access	switch port ѝ access port Â
trunk	switch port ѝ trunk port Â

switch port ѝ access

ϡ

switch port access˘ ‡ ˩ ѝ VLAN Â ˩ Л∪
switchport access vlan ϡ VLAN Â
switch port trunk˘ ‡ ˩ Л∪ VLAN Â ˩ Л∪
VLAN ˩ VLAN ɑ ˘ trunk port ˩ VLAN
VLAN Â ˩ Л∪ **switchport trunk** ϡ ⊮ ˩ VLAN Â

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

ϡ	
switchport access	ѝ statics accessport˘ ѝ VLAN Â
switchport trunk	ѝ trunkport native VLAN Trunk ˩ VLAN Â

˽

˽	
-	-

6.1.21 switchport trunk

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

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

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

allowed vlan *vlan-list*	Trunk ↵ VLAN Â vlan-list ↵ Л Ъ VLAN˘ ≠ ↵ Л Ъ VLAN˘ Л Ъ VLAN ID ˘ Л Ъ VLAN ID ˘ ˆ -˜ /! Â ' 10-20 Â ↵ Л Ъ ˆ ,˜ /! ˘ ' 1-10,20-25,30,33 all Ћ ↵ VLAN VLAN' add VLAN ╗ ↵ VLAN ' remove VLAN ÿ ↵ VLAN ' except VLAN VLAN ╗ ↵ VLAN '
native vlan *vlan-id*	Native VLAN Â

↵ VLAN all' Native VLAN ‡ VLAN 1

Native VLAN'

й Trunk˘ native VLAN Â native VLAN˘ Э
UNTAG ˘ й VLAN Â ˘ VLAN ID
ˆ IEEE 802.1Q PVID˜ native VLAN VLAN ID Â ↵ ˘ Trunk Э
native VLAN ˘ ‡ UNTAG Â

↵ VLAN '

Trunk ↵ Л Ъ VLAN˘ 1˙ 4094

Vlan lists is
1,3-4094

ϡ	
show interfaces	Â
switchport access	ѝ statics accessportť ѝ VLAN Â

ʌ	
-	-

6.2

6.2.1 show interfaces

ˇ ЛЬ ˝l Â

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

interface-id	ˆ ЛЬ à aggregateport à SVI à loopback ˜ Â
counters	Â
description	ˇ link Â
status	γ ˇ à ϟ Â
switchport	γ ˇ ϟ γ Â
trunk	trunking port ˇ à Aggregate port Â
transceiver	˝l Â
alarm	˝l ˇ l' None Ł Â

Â

a ╗ ˘ ‡ Â

˝I ˘ ╖ ˝I Â

˝I ˝I Digital Diagnostic Monitoring ╖

Â

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

duplex	┤ Â
flowcontrol	⁸ Â
interface gigabitEthernet	Л∪ ^ ¨I Л∪ ~ ˘ Â
interface aggregateport	… ˘ Â
interface vlan	… ╟ ^ switch virtual interface˘ SVI˜ ˘ Â
shutdown	˘ ȝ Â
speed	Â
switchport priority	802.1q ˝I Â
switchport protected	и Â

-	-

7 Aggregate Port

7.1

7.1.1 aggregateport load-balance

AP Â ¾ no ѝ Â

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

no aggregateport load-balance

dst-mac	MAC ¦ Â AP ˘ MAC ⅃ ⅃ ˘ MAC a ⅃ ¦ a ⅃ Â
src-mac	MAC ¦ Â AP ˘ a ⅃ MAC ¦ a ⅃ ˘ ⅃ MAC ⅃ Â

G£ýÀ

src-dst-ip

show aggregateport load-balance ¾ Â

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

¾	
show aggregateport load-balance	aggregateport Â

S8600 '

Ñ	
-	-

7.1.2 port-group

ѝ Aggregate Port Â ¾ no Aggregate Port Â

port-group *port-group-number*

no port-group

port-group-number	Aggregate Port Ñ˘ Aggregate Port Ñ Â

a Aggregate Port Â

¾ Â

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

Ю Л 1/3 AP 3 '

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

¾	
-	-

S8600 '

Â 8 '

Â … 128 AP Â

/Ì	
-	-

7.2

7.2.1 show aggregateport

aggregateport Â

aggregate-port-number	Aggregate Port /Ì Â
load-balance	aggregaye port Â
summary	aggregate port Â

aggregate port /Ì˘ ‡ aggregate port Â

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

¾	
aggregateport load-balance	AP Â

/Ì	

	-	-

8 VLAN

8.1

8.1.1 name

VLAN ¼ Â ¾ **no** Â

name *vlan-name*

no name

vlan-name	VLAN ¼

VLAN ¼ ŭ VLAN¯ VLAN ID˘ VLAN 2 ¼ ŭ ”VLAN0002”

¾ VLAN

show vlan ¾ vlan

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

¾	
show vlan	VLAN Â

¼

¼	
-	-

8.1.2 switchport access

¾ ŭ access port˘ ŭ VLAN Â

¾ **no** VLAN Â

switchport access vlan *vlan-id*

no switchport access vlan

vlan-id

access	switch port ù access port Â
trunk	switch port ù trunk port Â
hybrid	switch port ù hybrid port Â
uplink	switch port ù uplink port Â
dot1q-tunnel	switch port ù 802.1Q tunnel port Â

switch port ù access

¾

switch port access˘ ‡ ٬ ù VLAN Â ٬ Л
switchport access vlan ¾ VLAN Â
switch port trunk˘ ‡ ٬ Л VLAN Â ٬ Л
VLAN ٬ VLAN ¤ ˘ trunk port ٬ VLAN
VLAN Â ٬ Л **switchport trunk** ¾ ⊮ ٬ VLAN

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

¾	
switchport access	ù access port˝ ù VLAN Â
switchport trunk	ù trunk port native VLAN Trunk ٬ VLAN Â

٬

٬	
-	-

8.1.4 switchport trunk

ù trunk port 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** }

allowed vlan *vlan-list*	Trunk ٦ VLAN Â vlan-list ٦ Л Ъ VLAN˘ ≠ ٦ Л Ъ VLAN˘ Л Ъ VLAN ID ˘ Л Ъ VLAN ID ˘ ˆ -˜ /! Â ' 10-20 Â ٦ Л Ъ ˆ ,˜ /! ˘ ' 1-10,20-25,30,33 all Ћ ٦ VLAN VLAN' add VLAN ╗ ٦ VLAN ' remove VLAN ÿ ٦ VLAN ' except VLAN VLAN ╗ ٦ VLAN '
native vlan *vlan-id*	Native VLAN Â

٦ VLAN all˘ Native VLAN ‡ VLAN 1

¾

Native VLAN'

৻	
show interfaces	Â
switchport access	ὴ access porť ὴ VLAN Â

⁄

⁄	
-	-

8.1.5 vlan

৻ VLAN Â ৻ no VLAN Â

vlan *vlan-id*

no vlan *vlan-id*

–˜◦ t !53” l^ é‡‰ B #b N 9AD t˜ @F(a’’’ Fp„ ˆQd” 6! Q dï R sdC1D$ EHA T‹Â ð l! $

	-	-

8.2

8.2.1 show vlan

VLAN Â

show vlan [**id**

9 Super-vlan

9.1

9.1.1 subvlan

¾ super vlan subvlan subvlan Â

subvlan *vlan-id-list*

no subvlan [*vlan-id-list*]

Vlan-id-list	VLAN subvlan ID, ¿ vlan

¾ VLAN

no subvlan supevlan subvlan

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

¾	
show supervlan	supervlan Â

¿

¿	
-	-

9.1.2 subvlan-address-range

¾ subvlan ip Â

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

no subvlan-address-range

start-ip	SubVLAN IP
end-ip	SubVLAN IP

-

¾ VLAN

˘ **end** ¾˘ **Ctrl+C** Â

˘ **exit** ¾

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

¾	
show supervlan	supervlan Â

/

/	

¾

- -

¾ VLAN

˘ **end** ¾˘ **Ctrl+C** Â

˘ **exit** ¾

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

¾

¾	
show supervlan	supervlan Â

¼

¾

¼	
-	-

9.1.4 proxy-arp

¾ VLAN

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

३	
show supervlan	supervlan Â

/1	
-	-

10 Protocol VLAN

10.1

-	-

ʒ

Ruijie(config-if)# **protocol vlan ipv4**

ʒ	
no protocol vlan ipv4	-

ʌ ˚ RGOS10.1 ЛъЭ

ʌ	
-	-

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

Лъ profile

num	profile
type	Лъ

ʒ

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

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

RGOS10.1 Л Э

Л	
-	-

10.1.4 protocol-vlan profile num vlan id

profile

num	profile
id	VLAN ID 1- VLAN

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

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

RGOS10.1 Л Э

Л	

	-	-

10.2

10.2.1 show protocol-vlan

Protocol VLAN

show vlan protocol-vlan

	-	-

३

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

	३	
३	-	-

⁄	RGOS10.1 Л Э

	⁄	
३	-	-

11 Private VLAN

11.1

11.1.1 private-vlan association

secondary VLAN б primary VLAN ҃

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

no private-vlan association

svlist	й secondary VLAN list
no	ы primary VLAN б secondary VLAN

҃ Primary VLAN

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

҃	
show vlan private-vlan	-

ы ˚ RGOS10.1 ЛЬЭ

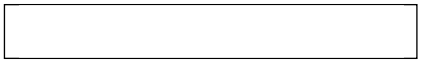
Л	
-	-

11.1.2 private-vlan mapping

secondary VLAN Ь SVI ҃

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

no private-vlan mapping



٦	
show vlan private-vlan	-

RGOS10.1 Л Э

/I	
-	-

11.1.5 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

p_vid	… primary VID
s_vid	… secondary VID
no	ÿ VLAN ў

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

٦	
show vlan private-vlan	-

RGOS10.1 Л Э

/I	

-	-

11.1.6 switchport private-vlan mapping

private VLAN secondary VLAN

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

no switchport private-vlan mapping

p_vid	… primary VID
svlist	… secondary VLAN list
no	secondaryVLAN

secondary VLAN

VLAN

```
Ruijie(config)# interface gigabitEthernet 0/1
Ruijie(config-if)# switchport mode private-vlan promiscuous
Ruijie(config-if)# switchport private-vlan mapping 22 add 23-25
```

show vlan private-vlan	-

RGOS10.1

-	-

11.2

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

-	-

RGOS10.1

-	-

11.3.2 switchport hybrid native vlan

switchport hybrid native vlan *vid*

no switchport hybrid native vlan

hybrid vlan

no	hybrid VLAN

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

-	-

RGOS10.1

ʒ	/ʃ	
	-	-

11.3.3 switchport mode hybrid

switchport mode hybrid

no switchport mode

ѝ hybrid

	no	hybrid

ʒ

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

ʒ	ʒ	
	-	-

ʃ ˚ RGOS10.1 ЛЬЭ

ʒ	/ʃ	
	-	-

12 QinQ

12.1

12.1.1 dot1q outer-vid vid register inner-vid v_list

tunnel Э˘ vid ╕

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

no dot1q outer-vid *vid* **register inner-vid** *v_list*

v_list	vlan id
vid	vlan id
no	↓

ৡ

Ю tag vid ╪ 4-22 ˘ ╕ tag vid ╪ 3

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

ৡ

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

↓ ˚ RGOS10.3 Л Э

ৡ

↓	

-	-

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

access˘ trunk˘ hybrid˘ uplink Э˘ vid

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

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

v	

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

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

v_list	vid
vid	⅄ tag vid
no	⅄

٦

Ю سجـ تخ Ò я w я w я

¾

Ю tag ″l tag

```
ruijie# configure
ruijie(config)# interface gigabitEthernet 0/2
ruijie(config-if)# dot1q-Tunnel cos 3 remark-cos 5
ruijie(config-if)# end
```

¾

¾	
show interface intf-name remark	-

√ -

¾

/I	
-	-

12.1.5 frame-tag tpid tpid

tpid

frame-tag tpid <*tpid*>

no frame-tag tpid

no	√ tpid

¾ (5760 √ Ю)

Ю tpid й 0x9100

```
ruijie(config)# interface g 0/3
```

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

?

?	
show frame-tag tpid	-

? RGOS10.1 ЛъЭ

?

?	
-	-

12.1.6 inner-priority-trust enable

/ ? tag ″I tag 8

inner-priority-trust enable

no inner-priority-trust enable

no	? tag ″I tag 8

?

?

ЮО tag ″I tag 8

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

?

?	

	show inner-priority-trust	-

٧	-

٣	٨	
	-	-

12.1.7 mac-address-mapping x source-vlan src-vlan-list destination-vlan dst-vlan-id

vlan ⌐ ╟ mac ⁸ vlan

mac-address-mapping x destination-vlan dst-vlan-id source-vlan src-vlan-list

no mac-address-mapping x destination-vlan dst-vlan-id source-vlan src-vlan-list

	٧ Э ÿ vlan ⊥
no	

no	uplink

uplink

Ю й uplink

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

show vlan	-

RGOS10.1

-	-

12.1.10 switchport dot1q-tunnel allowed vlan

dot1q-tunnel vlan

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

switchport dot1q-tunnel allowed vlan remove *v_list*

no switchport dot1q-tunnel allowed vlan

sw92	**H3 H5**

?

Ю dot1q-tunnel vlan 3-6 й ? vlan tag

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

?

?	
show interface dot1q-tunnel	-

? RGOS10.3 Л Э

?

Л	
-	-

12.1.11 switchport dot1q-tunnel native vlan

dot1q-tunnel vlan id

switchport dot1q-tunnel native vlan *vid*

no switchport dot1q-tunnel native vlan

vid	vlan id
no	vlan й 1

vlan й 1

?

Ю dot1q-tunnel vid й 8

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

ruijie(config)#**end**

show interface dot1q-tunnel	-

RGOS10.3

-	-

12.1.12 traffic-redirect access-group acl outer-vlan

access,trunk,hybrid, uplink vid

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

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

show traffic-redirect	-

RGOS10.3

-	-

12.1.13 traffic-redirect access-group acl inner-vlan

access,trunk,hybrid, uplink vid

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

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

acl	acl
vid	vid
no	vid

Ю й 1.1.1.2 vid й 6

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


show traffic-redirect	-

RGOS10.3

ৰ ॱ RGOS10.1 ЛЪЭ

ৰ	
-	-

12.1.15 l2protocol-tunnel

dot1q-tunnel γ

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

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

stp	stp
gvrp	gvrp
no	ৰ

ЮЗ

nel *proto-type* enable

Ⅱ

gvrp } **enable**

tp|gvrp } **enable**

	stp
	gvrp
	↓

Э γ Ⅱ

igure

```
g)# interface fa 0/1
g-if)# l2protocol-tunnel gvrp enable
g-if)# end
```

ʔ

stp	stp
gvrp	gvrp
no	й

Ю Э γ ╖

```
ruijie#configure
ruijie(config-if)#l2protocol-tunnel gvrp tunnel-dmac 011AA9 000005
ruijie(config-if)#end
```

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

RGOS10.4 Л Э

-	-

12.2

12.2.1 show dot1q-tunnel

dot1q-tunnel

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

intf-id	

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

-	-

RGOS10.3

-	-

12.2.2 show frame-tag tpid

tpid

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

intf-id	

a tpid

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

-	-

ȝ ˅ RGOS10.1 Л Э

ȝ	
-	-

12.2.3 show inner-priority-trust

˝l 8

show inner-priority-trust

-	-

a 8

ȝ

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

ȝ	
-	-

ȝ ˅ RGOS10.1 Л Э

ȝ	
-	-

12.2.4 show interface dot1q-tunnel

dot1q-tunnel

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

intf-id	

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

```
Ruijie# show interface intf-name remark
Ports         Type        From value  To value
------------ ----------- ----------- --------
Gi0/1         Cos-To-Cos  3           5
```

৲	

-	-

12.2.7 show registration-table

intf-id	

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


```
ruijie# show translation-table
Ports        Relay-VID  Type    VID-list
------------ ---------- ------- ------------------
Gi0/8        10         Local   8-9,15,20-30
Gi0/10       5          Inner   50-60
```

-	-

RGOS10.3

-	-

12.2.10 show l2protocol-tunnel

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

gvrp	gvrp
stp	stp

```
ruijie# show l2protocol-tunnel stp
Destination mac      : 01d0f8000005
L2protocol-tunnel : Stp Enable
ruijie# show l2protocol-tunnel gvrp
Destination mac      : 01d0f8000006
```

L2protocol-tunnel : gvrp Disable

-	-

RGOS10.3

-	-

13 Share VLAN

13.1

13.1.1 share

ৡ share vlan Â

14 MAC

14.1

14.1.1 address-bind

ip mac Â

address-bind *ip-address mac-address*

no address-bind *ip-address*

ip-address	IP Â
mac-address	mac Â

؃

IP MAC ˘ ‡ سجِ

/

address-bind install

no address-bind install

¶

IP MAC ˘ ‡ IP й IP
˘ MAC a й IP MAC ˘
Â

Ю ip й 3.3.3.3 mac 00d0.f811.1112

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

¶

¶	
show address-bind	

Л S8600 й 1K.

¶

Л	
-	-

14.1.4 address-bind ipv6-mode

ip IP

address-bind ipv6-mode compatible

address-bind ipv6-mode loose

ш

address-bind ipv6-mode strict

-	-

ш Â

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‡˘ Ю '

MAC ३

¶

IP MAC ˘ ‡ IP ѝ IP
˘ MAC a ѝ IP MAC ˘
˘ ѝ ˘ з (address-bind install)˘
a Â

Ю fa 0/1 ѝ

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

¶	

¶

show address-bind uplink

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


show mac-address-table dynamic

no mac-address-table aging-time

seconds	╟ ˘ Л∪ ѝ Æ Â ᾱ Â

300 Â

¾

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

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

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

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ᴎ	
-	-

14.1.10 mac-address-table filtering

Â ¾ **no**

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

14.1.14 mac-manage-learning uniform learning-synchronization

uniform Ю ╟ MAC ⅃ .

no mac-manage-learning uniform learning-sychronization

╟ MAC ⁻ и dispersive ⁄˘ ⁄Ц ⁻ MAC Â

¾	
show mac-address-table mac-manage-learning	MAC ⁻

⁄ -

⁄	
-	-

14.1.16 snmp trap mac-notification

MAC ╖ Â ¾ **no** ╖ Â

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

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

added	╖ Â
removed	Â

╖ Â

¾

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

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

¾	
mac-address-table notification	MAC ╖ Â

show mac-address-table notification

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

mac-address-table aging-time	╟ Â

/I	
-	-

14.2.5 show mac-address-table count

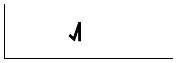
Â

show mac-address-table count

-	-

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

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



Ⱶ n

MAC ╖ Â

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

interface *interface-id*	/ı Â Э MAC ╖ Â
history	MAC Â

MAC ╖ Â

ৡ

Ruijie# **show mac-address-table notification interface**
Interface MAC Added Trap MAC Removed Trap
--- --- ---
GigabitEthernet1/14 Disabled Disabled
Ruijie# **show mac-address-table notification**
MAC Notification Feature : Disabled
Interval between Notification Traps : 1 secs
Maximum Number of entries configured in History Table :1
Current History Table Length : 0
Ruijie# **show mac-address-table notification history**
History Index : 0
MAC Changed Message :
Operation:ADD Vlan : 1 MAC Addr: 00f8.d012.3456 GigabitEthernet 3/1

ৡ	
mac-address-table notification	MAC ╖ Â
snmp trap mac-notification	MAC ╖ Â

ৡ

/ı	
-	-

14.2.10 show mac-address-table static

Â

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

mac-addr	MAC Â
vlan-id	VLAN Â
interface-id	(⅃ ⎍ AggregatePort)

ৡ

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

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

⅄

⅄	
-	-

14.2.11 show mac-address-table vlan

VLAN Â

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

vlan-id	VLAN ID Â

৭

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

-	-

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

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

-	-

14.2.13 show mac-address-learning

1'

Ruijie# show mac-address-learning

15 DHCP Snooping

15.1 DHCP snooping

15.1.1 ip dhcp snooping

DHCP Snooping ¶ ˘ ЮО ¾ Â ¾ no ˘ DHCP Snooping ¶ Â

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

-	-

¶

¾

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

DHCP Snooping б Private VLAN ¶ a Â

ЮО DHCP snooping ¶ '

```
Ruijie# configure terminal
Ruijie(config)# ip dhcp snooping
Ruijie(config)# end
Ruijie# show ip dhcp snooping
```

	show ip dhcp snooping	DHCP snooping	Â

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

¾	
show ip dhcp snooping	DHCP snooping

/I	
-	-

15.1.4 ip dhcp snooping database write-to-flash

DHCP Snooping ╟ FLASH ˚ ˘
ЮО ¾ Â

ip dhcp snooping database write-to-flash

-	-

¾ Â

¾˘ ˩ Л∪ DHCP Snooping ╟ FLASH ˚ Â

ЮО DHCP ╟ flash '

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

¾	
-	-

/I	

-	-

15.1.5 ip dhcp snooping information option

DHCP ╗ option82 ╗ ˘ ЮO ¾ Â
¾ no ˘ ╗ Â

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

-	-

╗ Â

¾

¾˘ DHCP ╗ option82 ˘ DHCP Ł option82
ˆ Â

ЮO DHCP ╗ option82 ╗ '

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

¾	
show ip dhcp snooping	DHCP snooping Â

	-	-

15.1.6 Ip dhcp snooping vlan

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

[**no**] **ip dhcp snooping vlan** {*vlan-rng* **|** {*vlan-min* [*vlan-max*]}}

vlan-rng	dhcp snooping ╖ vlan Â
vlan-min	dhcp snooping ╖ vlan Ю Â
vlan-max	dhcp snooping ╖ vlan Э Â

Ю˘ DHCP Snooping ╖ ˅˘ VLAN Â

¾ Â

¾˘ VLAN DHCP Snooping ╖ ˘ ≠ ˩ VLAN
DHCP Snooping ╖ Â ╖ DHCP Snooping Э Â

Ю

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

-	-

DHCP ˘ Ю ҳ Â ҳ
ч ⁸ Â

ncp snooping limit rate *rate-value*

rate-value	˘ PPS[Packet Per Second]

⁸

ҳ й ҳ Â
╖ DHCP Snooping ⁸ VLAN ˘ Â
╜ Э˘ CPP[CPU Protect Protocol]╖ Â CPP ˚ DHCP
⁸˘ CPP ″I DHCP Snooping ⁸ ╖ Â
CPP ╜ ˘ έ Â
┘Л **show ip dhcp snooping** ҳ˘ Э ⁸ Â

S86 a DHCP ⁸ ╖ Â

Ю 1 ⁸ й 100pps'
Ruijie#

٦	/ا	
	-	-

15.2.2 ip dhcp snooping suppression

ŭ suppression ˘ ЮO ٦ Â ٦ no ˘
ŭ no suppression Â

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

	-	-

٦	Â
٦	Â
	٦˘ ٦ ЮO DHCP ˘ ЮO DHCP Â

ЮO **fastethernet** *0/2* ŭ suppression '

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

٦	٦	
	-	-

٦	/ا	
	-	-

15.2.3 ip dhcp snooping trust

DHCP snooping ѝ TRUST ˘ Ю ٦ Â
٦ no ˘ ѝ UNTRUST Â

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

-	-

Ю˝ ѝ UNTRUST Â

٦ Â

٦˘ DHCP Ł ѝ TRUST ÂTRUST
DHCP ˘ UNTRUST DHCP Â

Ю **fastethernet21.1h531<7<E 90 8g119 Td( )Tj/C2T0 1 Tf635Tc 3.5691DA17E4040E>**

15.3 DHCP snooping

15.3.1 show ip dhcp snooping

DHCP Snooping ˘ ЮO ३ Â

show ip dhcp snooping

¾	¾
-	-

15.3.2 show ip dhcp snooping binding

DHCP Snooping ˘ ЮО ¾ Â

show ip dhcp snooping binding

¾	¾
-	-

¾

¾˘ ⊣ Л∪ DHCP Snooping Â

ЮО '

```
Ruijie# show ip dhcp snooping binding
Total number of bindings: 1

MacAddress    IpAddress   Lease(sec)  Type    VLAN  Interface
-----------   --------    --------    -----   ----  ---------
0000.0000.0001 1.1.1.1  78128  dhcp-snooping  1  FastEthernet 0/1
```

¾	¾	
ip dhcp snooping binding	DHCP snooping	
clear ip dhcp snooping binding	DHCP snooping ╟	

¾	¾	

	-	-

15.46[(148)43aee4dC603414clear ip dhcp s8 154.3 bind4.3 Tj/TT

16 IGMP Snooping

16.1

16.1.1 deny

profile ˘ profile Ю ٣ deny Â

deny

deny	profile

profile deny Â

٣ profile Â

″I profile Ю range ٣ Â٨ ˘ и profile ˘ profile Э Â

Ю … 224.2.2.2 profile '

```
Ruijie(config)# ip igmp profile 1
Ruijie(config-profile)# range 224.2.2.2
Ruijie(config-profile)# deny
```

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٣	
ip igmp profile	… profile
range	

٨

٣

٨	
-	-

16.1.2 permit

profile ˘ profile Ю ৡ permiť profile

	high-ip-address	
	Â	
३	profile Â	

IGMP Profiles Э ˘ ľ SVGL Ł à ľ Ł à ľ IGMP Filtering Ł ╗ Â ˘ й profile ˘ profile ╗ Â

Ю … Л й 1 profile profile Â

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

٦	

pim snooping igmp snooping IVGL

й IVGL-SVGL ˇ a Ѧ Ь ╖ Â˩ ˇ
Ь ╖ ˇ a IVGL-SVGL Â
pim snooping igmp snooping IVGL IVGL-SVGL
ˇ no ip igmp snooping igmp snooping ╖ ˇ
pim snooping ‡ ″I pim snooping˘ ɜ
a ╖ Â

Ю Э igmp snooping ivgl-svgl ˇ profile
й 1'

```
Ruijie(config)# ip igmp snooping ivgl-svgl 4e(config)#
```

Shared VLAN Â

SVGL Ю˝ IGMP Profile ˛ SVGL˘

˘ ⅃ Л↻ VLAN ' Ю a

SVGL ˘ Â

й SVGL ˘ a Ѧ Ь ╖ ˘ a

ip multicast-routing Â ⅃ ˘ Ь ╖ ˘ a

SVGL Â

pim snooping igmp snooping IVGL IVGL-SVGL

˘ ip igmp snooping svgl ˛ ˘ pim

snooping ‡ ˝I pim snooping˘ з ˛

a ╖ Â

Ю Э igmp snooping svgl ˘ profile й 1'

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

٦	
ip igmp snooping svgl vlan	Shared VLAN Â
ip igmp snooping svgl profile	SVGL profile Â

⅄

⅄	
-	-

16.1.8 ip igmp snooping vlan

vlan Э igmp snooping ivgl ˘ ٦ **ip igmp snooping vlan** Â ٦ no igmp snooping Â

ip igmp snooping vlan vid

no ip igmp snooping vlan vid

vid	vlan id

disable Â

٪ Â

ЮЎ vlan Э ╟ IGMP Snooping ╖ ˘ ٪ Â

vlan Э pim snooping igmp snooping ˘
no ip igmp snooping vlan vlan Э igmp snooping ╖ ˘
pim snooping VLAN ‡ ″I pim snooping˘
з a ╖ Â

Ю vlan 2 Э igmp snooping˙

```
Ruijie(config)# ip igmp snooping vlan 2
```

٪	
ip igmp snooping ivgl	igmp snooping ivgl Â
ip igmp snooping ivgl-svgl	igmp snooping Â

٨

٨	
-	-

16.1.9 ip igmp snooping svgl vlan

vlan и SVGL vlan˘ ٪ **ip igmp snooping svgl vlan** Â ٪ no и Shared VLAN и vlan 1 Â

ip igmp snooping svgl vlan vid

no ip igmp snooping svgl vlan

vid	vlan id

Ю Shared VLAN и vlan 1 Â

٪ Â

٪ ٨ SVGL IVGL-SVGL Ю Â

Ю vlan 2 й igmp snooping svgl vlan

```
Ruijie(config)# ip igmp snooping svgl vlan 2
```

ip igmp snooping fast-leave enable

no ip igmp snooping fast-leave enable

-	-

disable Â

३ Â

ÿ ÿ IP IGMP

˘ ÿ Ô

३ Â

IGMP

Server Â ٪	Serverˇ IP ╖ Â
╟ IP ╖ ٨˘ Ь ╖ Â ٪ ˘ Ь ╖ ˘ a IP ╖ Â	

Ю ip ip и 192.168.4.243 Â

```
Ruijie(config)# ip igmp snooping source-check default-server
192.168.4.243
```

٪	
ip igmp snooping limit-ipmc	╖ ip Â

٨

٨	
-	-

16.1.15 ip igmp snooping limit-ipmc

╖ IP ˘ ٪ **ip igmp snooping limit-ipmc vlan** ˘ ٪ no IP Â

ip igmp snooping limit-ipmc vlan *vid* **address** *gaddress* **server** *saddress*

no ip igmp snooping limit-ipmc vlan *vid* **address** *gaddress* **server** *saddress*

vid	ip vlan id Â
gaddress	Â
saddress	(┗) Â

Â

٪ Â

¨I IP ╖ ╖ Â

Ю ╖ ψ ip Â

```
Ruijie(config)# ip igmp snooping limit-ipmc vlan 1 address 224.0.0.1
```

server 192.168.4.243

٪	
ip igmp snooping source-check default-server	IP ٫ IP Â

٫

٫	
-	-

16.1.16 ip igmp snooping source-check port

٨ ٫ Â igmp snooping ˘ ٪ **ip igmp snooping source-check port** Â ٪ no ˘ Â

ip igmp snooping source-check port

no ip igmp snooping source-check port

-	-

˘ Â

٪ Â

IGMP SNOOPING ш Â ˘ ÿ ˘ ɣ IGMP Sooping ̓Ạ Э Â IGMP SNOOPING ˘ ٫ ÿ ˘ ɣ ̓Ạ ' ÿ ỳ ˘ Â ˘ ˘ ˘ ‡ Â ٫˘ VLAN a ˘ ѫ a Â

Ю igmp snooping ˘ Â

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

	↿	
↿		

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↿	-	-

16.1.17 ip igmp snooping suppression enable

igmp snooping Report ⁸╥ ˘ ↿ **ip igmp snooping suppression enable** Â ↿ no igmp snooping suppression Â

ip igmp snooping suppression enable

no ip igmp snooping suppression enable

-	-

disable Â

↿ Â

IGMP ⁸╥ ᆀ˘ ᆟ vlan IGMP Report ˘ ᆀ IGMP Report a Ɓ ƛ 0 א Ʊ >

-	-

16.1.18 ip igmp snooping mrouter learn pim-dvmrp

IGMP Query/Dvmrp/PIM Hellp

ip igmp snooping mrouter learn no

ip igmp snooping mrouter learn pim-dvmrp

no ip igmp snooping mrouter learn pim-dvmrp

vlan

vlan

vlan

vlan

igmp snooping

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

ip igmp snooping vlan mrouter learn pim-dvmrp	vlan

-

16.1.19 ip igmp snooping vlan mrouter interface

б è ,

٦ **ip igmp snooping vlan mrouter interface** Â ٦ no Â

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

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

vid	vlan id Â
interface-id	id

Â

٦ Â

ل Л Э ѝ ˘ ÿ Э IP
ل Л Â Ю ل ÿ
˘ è Â
╟ ˊ ╖ Ю ل Л Â

Ю '

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

٦	
ip igmp snooping source-check port	

ل

٨	
-	-

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

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

vid	vlan id Â

٦ Â

٦ Â

б è Â ЮЎ
VLAN ╟ ⌐ ˘ ┘Л VLAN ╟
⌐ ╗ ˘ no ٦ ╟ ⌐ ˘ ╟ ⌐ Â
˘ ┘ ÿ ˘
Ѣ ' ÿ ѝ ˘ Â
╗ ЮЎ ╟ ⌐ ˘ ┘Л igmp snooping
Â

ЮО vlan 1 ╟ ⌐ ╗ '

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

٦	
ip igmp snooping mrouter learn pim-dvmrp	╟ ⌐ ╗

┘

┘	
-	-

16.1.21 ip igmp snooping vlan static interface

igmp snooping ЮЎ ˘ ‡ a ┘
IGMP Â ٦ **ip igmp snooping vlan static interface** Â
٦ no Â

ip igmp snooping vlan *vid* **static** *ip-addr* **interface** *interface-id*

no ip igmp snooping vlan *vid* **static** *ip-addr* **interface** *interface-id*

vid	vlan id
ip-addr	
interface-id	id

Â

३ Â

IGMP Profile Ю˘ IGMP Report ˘ ‡
╕ IGMP Profile Â ˘ ‡ ╕ ˘
ﾉ ﾉ Â ″I … profile˘ ﾉ filter Â

Ю ″I 0/1 Э profile 1'

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

٪	
ip igmp profile	… profile

ﾉ

ﾉ	
-	-

16.1.23 ip igmp snooping max-groups

╟ ╕ , ٪ **ip igmp snooping max-groups** ٪ Â ٪ no ↓ ⁸ Â

ip igmp snooping max-groups *number*

no ip igmp snooping max-groups

number	и <0 – 1024>

a ↓ ⁸ Â

٪ Â

⌐ ˘ ‡ Э˘ ╟ ⌐
˘ a ″Ą ⌐ IGMP Report … Â

Ю ″I 0/1 Э ↓ 100 '

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

¶	
ip igmp snooping filter	Â

/I	
-	-

16.2

16.2.1 show ip igmp snooping

igmp snooping Â

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

	igmp snooping ¶ Â
gda-table	‡ Â
interfaces	igmp snooping filtring Â
mrouter	Â
statistics [**vlan** *vlan-id*]	snooping Â
vlan	vlan Ю snooping

¶ EXEC

¶	
-	-

३	/I	
	-	-

16.2.2 show ip igmp profile [profile-number]

		profile
	profile-number	profile

३	EXEC
	profile

३	३	
	-	-

✓I		
३	-	-

16.2.3 debug igmp-snp

IGMP Snooping Debug Â ३ no Â

debug igmp-snp

debug igmp-snp event

debug igmp-snp packet

debug igmp-snp msf

debug igmp-snp warning

undebug igmp-snp

17 PIM-Snooping

17.1 PIM-Snooping

17.1.1 ip pim snooping

PIM-Snooping˘ **ip pim snooping** ৡ Â ৡ no PIM-Snooping Â

ip pim snooping

no ip pim snooping

-	-

PIM-Snooping Â

ৡ

PIM-Snooping ╖ IGMP-Snooping IVGL IVGL-SVGL ˘ Ю IGMP-Snooping˘ ѫ PIM-Snooping ⊿ ╠ IGMP-Snooping IVGL ' Ю ╠ IGMP-Snooping SVGL ‡ PIM-Snooping a ╖˘ ″I IGMP-Snooping SVGL Â

PIM-Snooping˘ ѫ VLAN Э PIM-Snooping ╖ Â

&

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

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17.1.2 ip pim snooping

Э PIM-Snooping

17.1.3 show ip pim snooping

PIM-Snooping ˘ **show ip pim snooping** ¾ Â

show ip pim snooping [**detail**]

detail	

Â

¾ Â

Â

ЛЬЮ ¾ PIM-Snooping '

```
Ruijie#show ip pim snooping
Global runtime mode      : Enabled
Global admin mode        : Enabled
Number of user enabled VLANs: 2
User enabled VLANs: 199 198
```

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-	-

¾ √ Э Â

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-	-

17.1.4 show ip pim snooping neighbor

PIM-Snooping ˘ **show ip pim snooping neighbor** ¾ Â

show ip pim snooping neighbor

-	-

ЛЬЮ ҃ PIM-Snooping '

```
Ruijie#show ip pim snooping neighbor
IP Address      Port   Uptime/Expires    Flags
VLAN 199: 2 neighbors
214.199.199.2    2/32  00:18:25/00:01:04
214.199.199.10   2/20  00:18:09/00:01:03  DR
```

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17.1.5 show ip pim snooping vlan

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

show ip pim snooping vlan *interface-number* [neighbor]

interface-number	VLAN ID
neighbor	VLAN Ю

३

ЛЬЮ ३ PIM-Snooping VLAN199 '

```
Ruijie#show ip pim snooping vlan 199
4 neighbors (0 DR priority incapable)
DR is 214.199.199.4
```

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18 DHCPV6 Snooping

18.1

18.1.1 ipv6 dhcp snooping

dhcpv6 snooping ¶ ˘ Â ¾ **no** dhcpv6 snooping ¶ Â

ipv6 dhcp snooping

no ipv6 dhcp snooping

-	-

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¾ Â

¾ ¿Ú dhcpv6 snooping ¶ ˘ ¿Ú **show ipv6 dhcp snooping** ¾ dhcpv6 snooping ¶ Â

1' dhcpv6 snooping ¶ Â

```
Ruijie(config)# ipv6 dhcp snooping
```

¾	
show ipv6 dhcp snooping	dhcpv6 snooping ¶

¾

/¾	
10.4	¾

18.1.2 ipv6 dhcp snooping binding-delay

╠ ╗ ˚ ╗ Â ৡ no ˘
╗ Â

ipv6 dhcp snooping binding-delay *seconds*

no ipv6 dhcp snooping binding-delay

time	˚ ˘ Æ'

ৡ

ЮЎ ╠ ╗ ˚ Â ╗ Л˘ ╠
˘ IPv6 ă ˘ ˚ Â

1' ╠ 10 Ą ╗ ˚ Â

```
Ruijie(config)# ipv6 dhcp snooping binding-delay 10
```

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	10.4	ৡ

18.1.3 ipv6 dhcp snooping database write-delay

dhcpv6 snooping flash ˚ Â ৡ **no**
╗ Â

ipv6 dhcp snooping database write-delay *time*

no ipv6 dhcp snooping database write-delay

time	flash ˚

ৰ

ৡ	ৰ	
	10.4	ৡ

18.1.5 ipv6 dhcp snooping filter-dhcp-pkt

dhcpv6 Â ৡ no ˘ ℸ Â

ipv6 dhcp snooping filter-dhcp-pkt

no ipv6 dhcp snooping filter-dhcp-pkt

ৡ

ৡ ৰ˘ ৲ Ո dhcpv6 ˘ Ю dhcpv6 Â

1' **fastethernet** 0/1 dhcpv6

```
Ruijie(config)# interface fastethernet 0/1
Ruijie(config-if)# ipv6 dhcp snooping filter-dhcp-pkt
```

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	-	-

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	10.4	ৡ

18.1.6 ipv6 dhcp snooping ignore dest-not-found

ľ Ŀ Â ֳ no ˘ DHCPv6
Â

ipv6 dhcp snooping ignore dest-not-found

no ipv6 dhcp snooping ignore dest-not-found

ֳ

DHCPv6 ˘ MAC ˘ DHCPv6
Э a MAC ˘ й ˘ a Â
˘ ˩ à à ˘ MAC
˘ ˩ Э Y ˘ Э
ľ DHCPV6_SNOOPING-5-DEST_NOT_FOUND: Could not find destination port.
Destination MAC [mac-address] Ŀ˘ ˘ й DHCPv6 ˘ ˩ Л
Ю ˘ a MAC Л VLAN
Â

1' Â

```
Ruijie(config)# ipv6 dhcp snooping ignore dest-not-found
```

ֳ	
show ipv6 dhcp snooping	dhcpv6 snooping ╖

ʌ

ʌ	
10.4	ֳ

18.1.7 ipv6 dhcp snooping link-detection

LINK DOWN ˘ Э ╟ Â ֳ no ˘
╖ Â

ipv6 dhcp snooping link-detection

no ipv6 dhcp snooping link-detection

٦

Ю˝ LINK DOWN ˘ a Ю ╠ Â ╖ Л˘
LINK DOWN ˘ ╠ Ю ╠ Â

1' LINK DOWN ˘ ╠ Ю ╠ Â
```
Ruijie(config)# ipv6 dhcp snooping link-detection
```

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٦	
show ipv6 dhcp snooping	dhcpv6 snooping ╖

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٦

Л	
10.4	٦

18.1.8 ipv6 dhcp snooping trust

dhcpv6 snooping й trust Â ٦ no ˘
й untrust Â

ipv6 dhcp snooping trust

no ipv6 dhcp snooping trust

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ৡ	
10.4	ৡ

18.1.10 ipv6 source binding

╗ Â ৡ **no** ˘ ╗ Â

ipv6 source binding *mac-address* **vlan** *vlan-id ipv6-address* **interface** *interface-name*

no ipv6 source binding *mac-address* **vlan** *vlan-id ipv6-address* **interface** *interface-name*

mac-address	MAC
vlan-id	VLAN
ipv6-address	IPV6
interface-name	

a

ৡ

IPV6 ˘ a DHCPV6 ৸ IPV6 ˘ ৸ Л ╗ ˘ ৸Л Â

1' ╗

```
Ruijie(config)# ipv6 source binding 00d0.f866.4777 vlan 10
2001:2002::2003 interface fastethernet 0/10
```

ৡ	ৡ	
	show ipv6 source binding	╗ dhcpv6 snooping ╠

ৡ

ৡ		

dhcpv6 snooping ¶ Â

show ipv6 dhcp snooping

vlan *vlan_id*	VLAN
interface *interface_name*	

ৡ

ৡ˘ ৲ ภ dhcpv6 snooping Â

1' **show ipv6 dhcp snooping prefix**

```
Total number of prefix: 1
Mac Address     IPv6 Prefix  Lease(s)  VLAN  Interface
-------------   ----------   -------   ----  -----------
00d0.f801.0101  2001:2002::/64  42368     2    fa 0/1
```

ৡ

╗ dhcpv6 snooping ╠ Â

show ipv6 source binding [*ipv6-address*] [*mac-address*] [**vlan** *vlan_id*] [**interface** *interface_name*] [**dhcp-snooping** | **static**]

ipv6-prefix	ipv6
mac-address	mac
vlan *vlan_id*	VLAN
interface *interface_name*	
dhcp-snooping	dhcpv6 snooping ╠
static	╗

¾

¾˘ ┘Л╚ ╗ dhcpv6 snooping ╠ Â

1' ╗ dhcpv6 snooping ╠
Â ¿ type ˘ static ˘ dynamic ╠ Â

```
Ruijie# show ipv6 source binding
Total number of bindings: 1
Mac Address     Ipv6 Address     Lease(s)   type    Vlan   Interface
-------------   --------------  --------   ----   -----  ---------
00d0.f866.4777   2001:2002::2003   57      dynamic   10    fa 0/10
```

18.3.1 clear ipv6 dhcp snooping binding

dhcpv6 snooping Â

clear ipv6 dhcp snooping binding [*ipv6-address*] [*mac-address*] [**vlan** *vlan_id*] [**interface** *interface_name*]

ipv6-address	ipv6
mac-address	mac
vlan *vlan_id*	VLAN
interface *interface_name*	

ipv6-prefix	ipv6
mac-address	mac
vlan *vlan_id*	VLAN
interface *interface_name*	

৭

৭˘ ৸ ৸ dhcpv6 snooping Â

1' dhcpv6 snooping

```
Ruijie# clear ipv6 dhcp snooping prefix
```

৭	৭	

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৸	

1' dhcpv6 snooping dhcpv6

```
Ruijie# clear ipv6 dhcp snooping statistics
```


10.4	

19 ND Snooping

19.1

19.1.1 ipv6 nd snooping

IPv6 ND snooping ¶ Â ¬ Ʌ Ʊ ¾ no IPv6 ND Snooping ¶ Â

ipv6 nd snooping

no ipv6 nd snooping

¾

¾ ipv6 nd snooping ¶ ˘ Ʌ ¾ è Â Ʌ ¾ ˘ ¬ Â

' IPv6 ND snooping

Ruijie# **configure terminal**

Enter configuration commands, one per line. End with CNTL/Z.

Ruijie(config)# **ipv6 nd snooping**

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¾	
show ipv6 nd snooping	ipv6 nd snooping

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¾

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10.4(2)	ৡ

19.1.2 ipv6 nd snooping vlan

VLAN IPv6 ND snooping ╖ Â ┘Л℧ ৡ no VLAN IPv6 ND Snooping ╖ Â

ipv6 nd snooping vlan {*vlan-rng* | {*vlan-min* [*vlan-max*]}}

no ipv6 nd snooping vlan {*vlan-rng* | {*vlan-min* [*vlan-max*]}}

vlan-rng	vlan
vlan-min	vlan Э

10.4(2)	ʒ

19.1.3 ipv6 nd snooping trust

ѝ trust Â ⊣ Л∪ ʒ no ѝ untrust

ipv6 nd snooping trust

no ipv6 nd snooping trust

ѝ untrust

ʒ

' FastEthernet 0/1 ѝ Trust

```
Ruijie# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)# interface fastethernet 0/1
Ruijie(config-if)# ipv6 nd snooping trust
```

ʒ	
show ipv6 nd snooping	ipv6 nd snooping

19.1.4 ipv6 nd snooping check address-resolution

ND Â ¬Л∪ ¾ no ND Â

ipv6 nd snooping check address-resolution [**key-node-only**]

no ipv6 nd snooping check address-resolution

key-node-only	ND

¾

ND ˘ a ¬Л∪ Â

1' ND

```
Ruijie# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)#ipv6 nd snooping check address-resolution
```

2' ND

```
Ruijie# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)#ipv6 nd snooping check address-resolution
key-node-only
```

19.1.5 ipv6 nd snooping detect gateway

╟ ⁻ Â ┘Л ३ no ╟ ⁻ Â

ipv6 nd s.403L4ing03Lg detec6 gat way ra io d i p v 6 d s o o 4 i n g 0 4 L g d e t e c 6 g a t v

vlan-rng	vlan
vlan-min	vlan Э
vlan-max	vlan Ю

ʒ

' ╟ VALN ╟ ↓ ╖

```
Ruijie# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)# ipv6 nd snooping detect gateway vlan 8
```

ʒ	
show ipv6 nd snooping	nd snooping ╟ ↓ Â

↓

ipv6_address/prefix_len	IPv6 è

ʒ

' ╕

```
Ruijie# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)#ipv6 nd snooping key-node  2003::1/128
```

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ʒ	
show ipv6 nd snooping key-node	nd snooping

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ND ┘

è Â

' ╟
Ruijie# **configure terminal**
Enter configuration commands, one per line. End with CNTL/Z.
Ruijie(config)# **ipv6 nd snooping stateless-user combine-security**

ʒ

ʒ	
show ipv6 nd snooping	ipv6 nd snooping

ʃ

ʃ	
10.4(2)	ʒ

19.1.10 ipv6 nd snooping stateless-user address-bind

IPv6 ╟ ˚ Â ┘Ո ʒ no
╥ Â

ipv6 nd snooping stateless-user address-bind [**strict**] [**ip-mac**]
no ipv6 nd snooping stateless-user address-bind

strict	link-local ˘ link-local ˘ a link-local Â
ip-mac	IP+MAC ˘ a IP Â

ʒ

1'

```
Ruijie# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)# ipv6 nd snooping stateless-user address-bind
  2'      ш                          IP+MAC
Ruijie# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)#ipv6 nd snooping stateless-user address-bind strict ip-mac
```

¸	
show ipv6 nd snooping	ipv6 nd snooping

Л	
10.4(2)	¸

19.1.11 ipv6 nd snooping stateless-user station-move

8 ╟Â

ipv6 nd snooping stateless-user station-move

no ipv6 nd snooping stateless-user station-move

' ╟ ╟Â

```
Ruijie# configure terminal
```

```
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)# ipv6 nd snooping stateless-user station-move
```

३	

	show ipv6 nd snooping	ipv6 nd snooping

ग

	ग	
३	10.4(2)	३

19.1.14 clear ipv6 nd snooping key-node

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clear ipv6 nd snooping key-node [vlan *vid*]

vid	é VLAN

¸

'

```
Ruijie# clear ipv6 nd snooping key-node
```

¸	

/

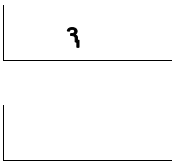
/	
10.4(2)	¸

19.1.15 clear ipv6 nd snooping stateless-user

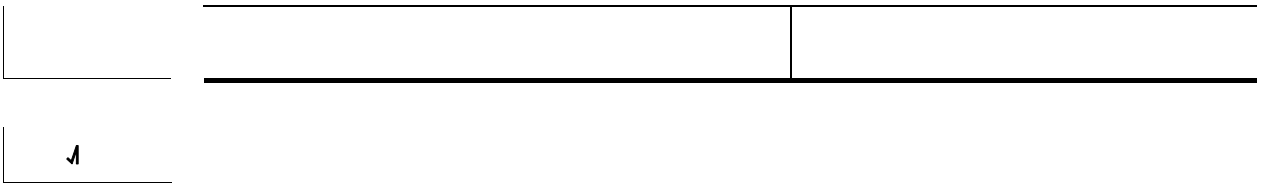
Â

clear ipv6 nd snooping stateless-user [vlan *vid*]

vid	é VLAN



```
Ruijie# clear ipv6 nd snooping stateless-user
```



19.2.2 show ipv6 nd snooping key-node

show ipv6 nd snooping key-node


```
Ruijie# show ipv6 nd snooping key-node 9664.3406 d2Ruijie#
```

19.2.3 show ipv6 nd snooping stateless-user

ipv6

show ipv6 nd snooping stateless-user

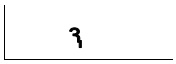
ipv6

```
Ruijie# show ipv6 nd snooping stateless-user
```


10.4(2)	

19.2.4 show ipv6 nd snooping prefix

show ipv6 nd snooping prefix


३

8 RSTP BPDU BPDU 8 Â

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

interface-id	

Â

¾

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

¾	
show spanning-tree interface	STP Â

¼

¼	
-	-

20.1.3 spanning-tree

MSTP MSTP MSTP Â ¾
no spanning-tree no ¾ ¼ 8
a spanning tree Â

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

३ Â

forward-time à hello-time à max-age Ь ˘ è

 somewhat ъ ъ

-	-

20.1.6 spanning-tree bpduguard

BPDU Guard Â ¬Л Ъ ¾ enabled disabled
BPDU Guard Â

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

enabled	BPDU Guard Â
disabled	BPDU Guard Â

Â

¾ Â

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

¾	
show spanning-tree interface	STP Â

Л	
-	-

20.1.7 spanning-tree compatible enable

MSTI ˘ Л Ъ б è
Â

spanning-tree compatible enable

no spanning-tree compatible enable

-	-

¾

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

¾	
-	-

¼

¼	
-	-

20.1.8 spanning-tree guard loop

Э loop guard Â ¾ no loop guard Â loop guard ╖ ˘ a bpdu ┘ Â

spanning-tree guard loop

no spanning-tree guard loop

-	-

loop guard ╖ Â

¾ Â

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

-	-

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

spanning-tree guard root

no spanning-tree guard root

-	-

root guard ¶ Â

¾ Â

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

¾	
-	-

/¹	
-	-

20.1.11 spanning-tree link-type

३ Â

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

३	
show spanning-tree interface	STP

.2 0 620.29mh(.23 2144/TT* n62852 g141.6 599.9 220.0804.24 15)T32.1720.5147.36 600.5 209.2804.

ʃ

ʒ	ʃ	
	-	-

20.1.13 spanning-tree max-hops

Ю ʒ ˩ Л∪ BPDU ^ Max-hops Count˜ ˇ
BPDU Region ʃ ʃ ˇ Instance Â no
˩ Л∪ ʒ Â

spanning-tree max-hops *hop-count*

no spanning-tree max-hops

hop-count	BPDU ˩ Л∪ ˇ й 1 · 40

hop-count й 20

ʒ

Region ˇ Root Bridge BPDU Hot Count ˇ ÿ Root Bridge ˇ
ˇ Hop Count 1˜ й 0 ‡ BPDU ˇ
Hops й 0 BPDU Â
˩ max-hops Instance Â

Ю MST Instance Max-hops й 10ʹ

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

≠ ˩ Л∪ **show spanning-tree mst** ʒ Э

ʒ	
show spanning-tree	MSTP

ʃ

ʃ	
-	-

instance vlan Vlan Instance 0 Â
name ì Â
revision ì 0 Â

३ .

VLAN 3 ÿ Instance 1 ˘ ¤ MST /˘ Ю

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

Instance 1 ˘ Ю'

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

˩Л∪ MST ¾ show Э Â

¾

¾	
show spanning-tree mst	MST region
instance instance-id vlan vlan-range	Vlan ╗ MST Instance
name	MST ˩
revision	MST /I
show	MST Ю MST

˩I

¾

/I	
-	-

20.1.16 spanning-tree mst cost

Ю ¾ Instance Â no ˩Л∪ ¾ Â

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

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

instance-id	Instance /I˘ й 0' 64
cost	˘ й 1' 200' 000' 000

Instance-ID й 0

й Interface ╠ Â

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

¾ .

cost

Region Â ”I ⅄ ˇ Ⅱ

Â

ice 20 Gigabitethernet 1/1 ”I ѝ 10ʹ

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

⅄Ⅱ **show spanning-tree mst instance interface** *interface-id* ҄ Э

Â

.

Ю Instance 20 ″I й 8192″

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

ㅓЛЪ **show spanning-tree mst instance interface interface-id** ३ Э Â

३	
show spanning-tree mst	MSTP Â
spanning-tree mst cost	Â
spanning-tree mst port-priority	a ㅓ Instance ″I Â

ㅅ

/I	
-	-

20.1.19 spanning-tree pathcost method

Â ३ no Â

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

no spanning-tree pathcost method

long	802.1t path-cost Â
short	802.1d path-cost Â

802.1T Path-cost Â

Â

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

३	

show spanning-tree interface	STP Â

¼

¾	
¼	
-	-

20.1.20 spanning-tree portfast

Portfast Â ¼Ú ¾ disabled Portfast Â

spanning-tree portfast [**disabled**]

disabled	Portfast Â

Â

¾ Â

-

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

¾	
show spanning-tree interface	STP Â

¼

¼	
-	-

20.1.21 spanning-tree portfast bpdufilter default

BPDU filter Â ¼Ú ¾ no BPDU filter Â

spanning-tree portfast bpdufilter default

no spanning-tree portfast bpdufilter default

-	-

BPDU filter

¾ Â

BPDU Filter ˇ a ≠ a BPDU Â **show spanning-tree** ¾ Â

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

¾	
show spanning-tree interface	STP Â

20.1.24 spanning-tree reset

spanning-tree ѝ Â ৡ no Â

spanning-tree reset

-	-

ৡ Â

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

ৡ	
show spanning-tree	STP Â
show spanning-tree interface	STP Â

ৰ

ৰ	
-	-

20.1.25 spanning-tree tc-guard

tc- guard Â ৡ no tc- guard Â tc-guard ٦ ˇ tc Â

spanning-tree tc-guard

no spanning-tree tc-guard

-	-

tc- guard Â

¾

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

¾	
-	-

¼

¼	
-	-

20.1.26 spanning-tree tc-protection

tc- protection Â ¾ no tc- protection Â

spanning-tree tc- protection

no spanning-tree tc- protection

-	-

tc- protection Â

¾ Â

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

¾	
-	-

¼

¾	/I	
	-	-

20.1.27 spanning-tree tc-protection tc-guard

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

spanning-tree tc-protection tc-guard

no spanning-tree tc-protection tc-guard

	-	-

tc- guard Â

¾ Â

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

¾	¾	
	-	-

/I

¾	/I	
	-	-

20.1.28 spanning-tree tx-hold-count

STP TxHoldCount ˘ BPDU Â ¾ no
Â

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

no spanning-tree tx-hold-count

tx-hold-count	TxHoldCount Â ÿ 1 10 Â

3 Â

¾ Â

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

¾	
show spanning-tree	MSTP Â

¼

¼	
-	-

20.2

20.2.1 show spanning-tree

Â

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

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

¾ Â

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

¾	
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

¾

/I	
-	-

20.2.2 show spanning-tree interface

STP Â ¬ Â

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

interface-id	/I
bpdufilter	bpdufilter Â
portfast	portfast Â
bpduguard	bpduguard Â

link-type	linktype

¾ Â

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

¾	
spanning-tree bpdufilter	BPDU filter Â
spanning-tree portfast	portfast Â

20.2.3 show spanning-tree mst

ЮO ३ ⊣ Л∪ MST ˇ Instance Â

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

configuration	mst
instance-id	*Instance ⁄!*
interface-id	⁄!

Instance Â

३ .

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

३	
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

⁄!

⁄!	

21 SPAN

21.1

21.1.1 monitor session

… SPAN ˆ ˜ ˆ ˜ . ৡ no
Â

monitor session *session_number* {**source interface** *interface-id* [**both** | **rx** | **tx**] | **destination interface** *interface-id* { **encapsulation | switch** } | **mac** {**source** *mac-addr*| **destination** *mac-addr* } [**both** | **rx** | **tx**]} [**acl** *name*]

no monitor session *session_number* [**source interface** *interface-id* [**both** | **rx** | **tx**] | **destination interface** *interface-id* { **encapsulation | switch** }] | **mac** {**source** *mac-addr*| **destination** *mac-addr* } [**both** | **rx** | **tx**] [**acl** *name*]

no monitor session all

session_number	SPAN ᴖ Â
source interface *interface-id*	Â *interface-id* ᴖ˘ ৸ ৮ ˘ a ৸ Ɲ৮ ৮ SVI Â
destination interface *interface-id*	Â *interface-id* ᴖ˘ ৸ ৮ ˘ a ৸ Ɲ৮ ৮ SVI Â
mac source *mac-addr*	MAC
mac destination *mac-addr*	MAC
both **acl** *name*	৸ Â **acl** *name/id*
rx	৸ Â
tx	৸ Â
all	
encapsulation	৲ , 8 tag˘ ৮ a
switch	৲ ˘ ৮ a

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

session *session_number*	SPAN /I

SPAN

¾

IO **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
```

¾	
monitor session	… SPAN ˆ ~ ˆ ~ Â

/I

/I	
-	-

22 RSPAN

22.1

22.1.1 monitor session

… RSPAN ˆ ˜ à ˆ ˜ ৶ Â
ৡ no

1/2 //a ¬

```
Ruijie(config)# monitor session 2 destination remote vlan 7
interface gigabitEthernet 1/3 switch //  ¬
Ruijie(config)# monitor session 2 destination remote vlan 7
reflector-port interface gigabitEthernet 1/1 switch
  2'
Ruijie(config)# monitor session 2 remote-destination
Ruijie(config)# monitor session 2 destination remote vlan 7
interface gigabitEthernet 1/1 switch
```

¾

¾	
show monitor	Â

¬ a ¬ reflector-port Â

¾

¬	
-	-

22.1.2 remote-span

¾ RSPAN VLAN

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

-	-

¾ VLAN

˘ **end** ¾˘ Ctrl+C Â

˘ **exit** ¾

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

¾

¾	

	show vlan	Vlan Â
¼	SS8600 a ¬ Â	

¾	¼	
	-	-

23 IP

23.1

23.1.1 ip address

ꝛ IP ˘ ⅃ Л∪ no IP Â ꝛ Ю'

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

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

	Æ

C Â ч ˘ Лυ IP Â
Â γ ˘ ǂ Â IP ↲Лυ
˘ IP Â ˘ IP Â
Â ч ↿ ˘ ↲Лυ… ˘
IP ˘ Â a ч ч
ЛυЭ Â

ЛυЮ ˘ ў IP й 10.10.10.1˘ й 255.255.255.0 Â

```
ip address 10.10.10.1 255.255.255.0
```

ȝ	
show interface	Â

γ Э˘ ↲ Ь IP ˘ з а γ ˘ secondary
Â

↿	
-	-

23.1.2 ip unnumbered

ȝ ↿ ˘ й ↿ ↿˘ Э IP ˘
↲Лυ IP Â ↲Лυ no ↲ Â

ip unnumbered *interface-type interface-number*

no ip unnumbered *interface-type interface-number*

interface-type	Â
interface-number	↿ Â

Ю˘ ↿ Â

ȝ Â

↿ ↲ ╟ IP ˘ aǂ IP ˘ ↿ έ
IP Â ↿ IP ˘ IP й IP
Â ↿ ≠ IP ˘ ᾱ ↿

Â Л ˇ ЛЬЮ ⁸'
Â Лυ a Л Â
Â SLIP ąHDLC ąPPP ąLAPB ąFrame-relay ˇ ˩ Лυ Л Â
ˇ ˩ Л Â X.25 a
Л Â
Â a ping ȝ Л ˇ ѝ Л IP Â
SNMP ˩ Лυ Л Â
Â a Л ╟ Â

ЛЬЮ ˇ ѝ Л ˇ ѝ FastEthernet 0/1 Â
IP Â

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

ȝ

ȝ	
show interface	Â

˩ ȝ γ Э a Â

ȝ

Л	
-	-

23.1.3 move ip

ȝ ч IP Â

move ip interface *interface-type interface-number1* **interface** *interface-type interface-number2*

interface-type interface-number1	IP
interface-type interface-number2	IP

ȝ Â

Â ȝ ˩ IP ˇ Ю è ˇ ″I Â

Â ˘ ‡ Â
Â SVI˙ ‡ ३ ⁄˘ ⁄ SVI Â
Â ЮO ″I IP ˘ ‡ ३ ⁄˘ IP
˘ ⁄ IP ३ ЮO IP Â

interface vlan 1 Э IP interface vlan 2 Э Â

```
move ip interface vlan 1 interface vlan 2
```

३	
show interface	Â

⁄ ३ γ Э a Â

/I	

10.4ˆ 2b3˜

RGOS ARP ă ˘ 32 Æ IP 48 Æ MAC Â

Â

ARP IP ˘ ˘ IP ˚ ˚
Â ˚ **arp anti-ip-attack** *num*
Â ˚ ˘
arp anti-ip-attack *num* ˘ Â

1' ARP ˘ IP й 5Â

```
Ruijie(config)# arp anti-ip-attack 5
```

2' ARP ˘ ARP IP

```
Ruijie(config)# arp anti-ip-attack 0
```

1' ЛЬЮ ˘ SVI 1 ARP Â

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

2' ЛЬЮ ˘ SVI 1 ARP

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

३

३	
-	-

ᴎ

३

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-	-

23.2.4 arp retry interval

३˘ ˩Л arp ˘ ˩ IP ˘ 2 ARP Â ३ no ˩Л 1 ARP Â

arp retry interval *seconds*

no arp retry interval

seconds	<1-3600>,ARP ˩Л й 1 —— 3600 ˘ й 1

ARP й 1 Â

३ Â

ARP ˘ ὲ ˘ ˩Л ARP ˘ a ╟ ARP Â

ЛЬЮ ˘ ARP й 30s

```
arp retry interval 30
```

३

३	

Arp retry times *number* ARP

arp trusted aging

no arp trusted aging

-	-

GSN ٦ ARP a Â

٦ Â

٦ ٨ ٦ ARP ˘ ╟ ARP ٦ Â ٦ Л Ю **arp timeout** ٦ Â

٦	
service trustedarp	٦ ARP ╖

٨

٨	
-	-

23.2.8 arp trusted *number*

٦˘ ٦ Л ARP Â ٦ no Â

arp trusted *number*

no arp trusted

number	٦ Л ARP

a ٦ a ٦ Â

٦ Â

ֆ ˘ ”I ┘ ARP ╖ Â ┘ ARP è ˘
┘ ´ ˘ ┘ ╟ ARP a Â ˘ a
Â

ٹ	
-	-

٨	
-	-

23.2.10 ip proxy-arp

Э ٹ ARP ╖ ˘ ٧ Л∪ **ip proxy-arp** ٹ Â ٹ no ٧ Л∪ ٹ ARP ╖ Â

ip proxy-arp

no ip proxy-arp

-	-

10.2(3) ٨ (10.2(3)) ˘ Ь ٹ ARP˝ ٹ ARP Â

ٹ Â

ٹ ARP ╖ ٧ Л∪ ╠ ў ˘ è IP MAC Â ARP ˘ ARP IP б IP a ٧ ˘ IP ˘ ARP ˘ MAC й Л∪ MAC Â Л∪ Э ٹ ARP ╖ Â

ЛюЮ ˘ Л∪ FastEthernet 0/1 ٹ ARP ╖ Â

```
interface fastEthernet 0/1
no switchport
ip proxy-arp
```

ٹ	
-	-

٨ ٹ γ Э a Â

٦	/ا	
	-	-

23.2.11 service trustedarp

ل ARP ╖ ˘ ل Лυ **service trustedarp** ٦ Â ٦ no ل ARP ╖ Â

service trustedarp

no service trustedarp

	-	-

ل ARP Â

٦

ل ARP ╖ ARP ╖ ˘ ѝ GSN ˘ GSN Â

ЛυЮ ˘ Ю˘ **service trustedarp** ╖ Â

```
config
service trustedarp
```

٦	٦	
	-	-

ا -

٦	/ا	
	-	-

23.3

23.3.1 ip broadcast-addresss

ৡ **ip broadcast-addresss** Â ৡ no

Â

ip broadcast-addresss *ip-address*

no ip broadcast-addresss *ip-address*

access-list-number	ˆ ˩ ˜ /ˇ ÿ 1-199 1300 - 2699 Â ЊЋ /ˇ ˬ ˥ IP Â

Â

٦

IP й IP IP ˇ й
172.16.16.255 й Â a
Â
б IP ˇ
Â /ˇ й
ˆ IP й ľ 1 Ł ˜ ˇ /˩
Э ў Â
˩ Л Э˘ ╟ ╖ ˇ ˩ Л
Â ٦ ˬ /ˇ
a è Â
Э˘ ˩ Л ЊЋ ⁸ Â ЊЋ ˇ
ˬ ЊЋ Â
Э **no ip directed-broadcast** ˇ RGOS
Â

ЛЬЮ ˇ FastEthernet 0/1 Â

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

٦

٦	
-	-

/ˬ ٦ γ Э a Â

/ˬ

/ˬ	
-	-

23.4 IP

23.4.1 clear arp-cache

ÿ ARP ă ╟ ARP ˘ ϛ clear arp-cache Â

clear arp-cache [**vrf** *vrf_name* | **trusted**] [*ip* [*mask*]] | **interface** *interface-name*

trusted	┘ ARP
vrf *vrf_name*	VRF ╟ ARP
ip	IP ˘ IP ARP ˘ **trusted** ‡ ┘ ARP ˘ ‡ ϰ ╟ ARP
mask	mask ϰ ˘ ARP ˘ IP /ſ ; trusted ‡ ┘ ARP ˘ ‡ ╟ ARP Â
interface *interface-name*	╟ ARP

ϛ

┘Л∪ ϛ ⁹ ARP Â

NFPP(Network Foundation Protection Policy ,) Э˘

mac (IP) ┘ ARP ˘ ч clear arp 1s ˘ ┘

γ ARP a Â

1' ЛЬЮ ˘ ARP ╟ ă Â

```
clear arp-cache
```

2' ЛЬЮ ˘ ╟ ARP 1.1.1.1

```
clear arp-cache 1.1.1.1
```

3' ЛЬЮ ˘ SVI1 Ю ╟ ARP

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

ϛ

ϛ	
arp	ARP ╗ Â

/ſ

ϛ

/ſ	
-	-

23.4.2 clear ip route

IP IP ˘ ⅃Л **clear ip route** ३ Â

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

*	
network	
netmask	ˆ ⅃ ˜

३

˘ ⅃Л ⁹ Â
˘ Â

ЛЬЮ ˘ ⅄ 192.168.12.0 Â

```
clear ip route 192.168.12.0
```

३	
show ip route	IP

⅄ ३ γ Э a Â

⅄	
-	-

23.4.3 show arp

ˆ ARP˜ ă Â

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

vrf *vrf_name*	VRF ˘ VRF ARP Â

trusted	┘ ARP ˘ ┘ VRF ┘ ARP Â

IP ˘ IP ARP ’

ip

Age (min)	ARP ă ˘ Лў Â ˘ “-” Â
Hardware	б IP ˚ Â
Type	˚ ˘ Л∪ ѝ ARPA Â
Interface	б IP Â

2' ЛЬЮ 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
```

3' ЛЬЮ **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
```

-	-

ЛЬЮй **show arp counter**

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

ARP ˘ ARP ˆ ╟ à à à ↓ ˜ à
γ ˘ ↓ Л∪ Â

Ruijie# show arp detail

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

ARP ă Ю'

IP Address	б ˚ IP Â
MAC Address	б IP ˚ Â
Type	ARP ˘ à ╟ à ↓ à Â
Age	ARP ˉ ˘ Æ† Â
Interface	б IP Ь Â
Port	б ARP γ Â

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10.4	10.4

23.4.6 show arp timeout

╟ ARP

show arp timeout

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ЛЬЮ й **show arp timeout** '

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

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Л ٦ γ Э a Â

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-	-

23.4.7 show ip arp

ˆ ARP˜ ă ˇ ٦ Â

show ip arp

-	-

ЛЬЮй **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

23.4.8 show ip interface

ঽ ⅃ Л Ʊ IP Â ঽ Ю'

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

Interface-type	
Interface-number	Л

ঽ

⅃ ˘ RGOS ... Â ⅃
RGOS ˚ ⅃ Л Ʊ Â ÿ ⅃ ⅃ и a ⅃ ˘ RGOS
˚ ÿ Â
⅃ ˘ ⅃ ˘ Ґ UP Ł'
⅃ ˘ Ґ UP Ł Â
a ⅃ ˘ ⅃ a ˘ и Â

ЛЬЮ и **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.
```

Ю'

IP interface state is:	˩ ˘ è ˚ ѝ “UP” Â
IP interface type is:	˘ ˘ Â
IP interface MTU is:	MTU Â
IP address is:	IP Â
IP address negotiate is:	IP Â
Forward direct-boardcast is:	Â
ICMP mask reply is:	ICMP Â
Send ICMP redirect is:	ICMP Â
Send ICMP unreachabled is:	ICMP a ˩ Â
DHCP relay is:	DHCP Â
Fast switch is:	IP ╖ Â
Route horizontal-split is:	˚ ˘ ѝ Â
Help address is:	helper IP Â
Proxy ARP is:	ƺ ARP Â
Outgoing access list is	Â
Inbound access list is	Â

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23.4.9 show ip redirects

show ip redirects

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ʒ γ Э Â

Ю й **show ip redirects** Â

```
Ruijie# show ip redirects
Default Gateway: 192.168.195.1
```

IP

24.1.2 ip mtu

IP ^ MTU˜ ˇ ⅋ **ip mtu** Â ⅋ no ⅃Ⅱ Â

ip mtu *bytes*

no ip mtu

bytes	IP ˇ Ⅱ и Æˇ 68~1500 Â

б ⅋ mtu ⅃ Â

⅋

IP IP MTU ˇ RGOS ˚ ⅈ Â ⅃ Э ˇ ὲ IP MTU Â

⅋ mtu ˇ IP MTU ╟ б MTU Â ⅂ ˇ IP MTU ˇ MTU a ⅃ Â

ⅡЮ ˇ FastEthernet 0/1 IP MTU и 512 Â

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

⅋	
mtu	Â

⅄ ⅋ γ Э a Â

⅄	
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24.1.3 ip redirects

RGOS ˚ ⅃Ⅱ ICMP ˇ ⅋ **ip redirects** Â ⅋ no ⅃Ⅱ ICMP ╖ Â

ip redirects

no ip redirects

-	-

Â

a ˘ ˩ ÿ ˘ ÿ
Â ÿ ˘ ICMP
˘ ˩ Э Л Л Â
Л Â
RGOS ˚ ICMP Â

ЛЬЮ ˘ FastEthernet 0/1 ICMP Â

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

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Л ¶ γ Э a Â

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24.1.4 ip source-route

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

ip source-route

no ip source-route

-	-

Â

ICMP a Â

ЛЬЮ FastEthernet 0/1 ICMP a Â

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


25 DHCP

25.1 DHCP

25.1.1 bootfile

Ⱶ DHCP ╟ ˚ ⅃˘ DHCP ⅋ **bootfile** Â ⅋ **no** ⅃ Ʌ∪ ⅄ Ⱶ Â

bootfile *file-name*

no bootfile

file-name	Ⱶ ╟ ˚ ⅃ Â

Ⱶ ╟ ˚ ⅃ Â

⅋ DHCP Â

DHCP ╟ Ю à ˚ ˘ DHCP ⊾ ╟ ˚ ⅃˘ DHCP ⅃ Ʌ∪ ⊾ ^ TFTP˜ Ю ˚ Â ὲ ⊾ **next-server** ⅋ Ⱶ Â

Ʌ∪Ю ˘ Ⱶ router.conf ὶ ╟ ˚ ⅃ Â

```
bootfile router.conf
```

⅋	
ip dhcp pool	Ⱶ DHCP ⅃ ˘ DHCP Â
next-server	DHCP ╟ Ю ⊾ IP Â

⅄

⅄	
-	-

25.1.2 client-identifier

ᕼ DHCP ˆ Л Ὼ ⁸ ˜ ˇ DHCP
঳ **client-identifier** Â ঳ **no** ᒉ Л Â

client-identifier *unique-identifier*

no client-identifier

unique-identifier	DHCP ˇ Л Ὼ ⁸ Â ' 0100.d0f8.2233.b467.6967.6162.6974.4574.6865.726e.6574.302f.31 Â

Â

DHCP Â

DHCP DHCP ᒪ ᛏ IP ˇ ˇ
঳ Â à MAC ᒉ ˇ MAC ᕀ 00d0.f822.33b4 à ᒉ ᕀ GigabitEthernet 0/1 ᕀ 0100.d0f8.2233.b467.6967.6162.6974.4574.6865.726e.6574.302f.31˘ è 01 ঳ Л ˇ

67.6967.6162.6974.4574.6865.726e.6574.302f.31 ᕀ GigabitEthernet0/1 Ὼ ⁸ Â ঳ ᕼ˝ ᒉ Л RFC1700 ľ Address Resolution Protocol Parameters ᒪ Â
ᒉ DHCP ᕼ ˇ ᒉ Л ঳ Â

ЛЮ ˇ ᕼ MAC ᕀ 00d0.f822.33b4 Л DHCP Â

```
client-identifier
0100.d0f8.2233.b467.6967.6162.6974.4574.6865.726e.6574.302f.31
```

঳	
hardware-address	ᕼ DHCP ˇ Â
host	ᕼ IP Â DHCP Â
ip dhcp pool	ᕼ DHCP ᒉ ˇ DHCP Â

¼

¾

¼	
-	-

25.1.3 client-name

¼ DHCP ¼ ˘ DHCP ¾ **client-name** Â ¾ no DHCP ¼ Â

client-name *client-name*

no client-name

client-name	¼ DHCP ¼ Â ¼ ЛЬ ASCII Â ¼ a ¼ ¼˘ ¼ river ѝ DHCP ¼ ˘ a ¼ ѝ river.i-net.com.cn Â

¼ ¼ Â

¾ DHCP Â

¼ DHCP ¼ ˘ ¼ ЛЬ ¾ ¼ DHCP ¼ Â ¼ a ¼ ¼ Â

ЛЬЮ ˘ ¼ river ѝ ¼ Â

```
client-name river
```

¾	
host	¼ IP Â DHCP Â
ip dhcp pool	¼ DHCP ¼ ˘ DHCP Â

¼

¼	
-	-

25.1.4 default-router

Ⱨ DHCP ˇ DHCP ٪ **default-router** Â ٪ **no** ⊿ Л∪ Ⱨ Â

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

no default-router

ip-address	Ⱨ IP Â Â
ip-address2…ip-address8	ˆ ⊿ ˜ ⊿ Л∪ 8 Â

Ⱨ Â

٪ DHCP Â

Ю˝ DHCP ÿ DHCP Ł ÂDHCP Ł
и IP ˇ б† ⊿ Â

ЛЮ ˇ Ⱨ 192.168.12.1 и Â

```
default-router 192.168.12.1
```

ip-address	⊮ DNS ┗ IP Â Â
ip-address2…ip-address8	ˆ ┘ ˜ ┘ Л∪ 8 DNS ┗ Â
use-dhcp-client *interface-type interface-number*	RGOS ˚ DHCP DNS ┗ ˘ и DHCP DNS ┗ Â

⊮ DNS ┗ Â

domain-name	㖞 DHCP ʎ ʅ Â

ʎ ʅ Â

DHCP Â

DHCP ʎ ʅ ʎ˘ ɛ ʎ ʎ ʅ ÿ ˘ ÿ ʅ ʅ ɲ Â

ɲЮ ˘ DHCP 㖞 ʎ ʅ i-net.com.cn Â

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

ʅ	
dns-server	㖞 DHCP DNS ⌊
ip dhcp pool	㖞 DHCP ʅ ˘ DHCP Â

ʎ

ʎ	
-	-

25.1.7 hardware-address

㖞 DHCP ˘ DHCP ʅ **hardware-address** Â ʅ **no** ʅ ɲ 㖞 Â

hardware-address *hardware-address type*

no hardware-address

hardware-address	㖞 DHCP MAC Â

type	DHCP ˚ ˇ Â Â ethernet Â ieee802 Â 1ˆ 10M ethernet˜ Â 6ˆ IEEE 802˜

˚ Â
ˇ ѝ ethernet Â

¾ DHCP Â

DHCP ˇ Â

ЛъЮ ˇ ѝ ethernet MAC 00d0.f838.bf3d Â
`hardware-address 00d0.f838.bf3d`

¾	
client-identifier	ѝ DHCP ˆ Л Ω ˜ Â
host	ѝ IP Â DHCP Â
ip dhcp pool	ѝ DHCP ˇ DHCP Â

Л	
-	-

25.1.8 host

ѝ DHCP ў IP ˇ DHCP ¾ **host** Â ¾ **no** Л DHCP IP ѝ Â

host *ip-address* [*netmask*]

no host

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

⊮ ў IP Â

३ DHCP Â

⊮ DHCP ㄴ IP Â

a DHCP IP Â

ৡ

RGOS ˚ DHCP ˘ IP ˘ DHCP ┺
' 1˜ DHCP 1˜ ' 2˜ DHCP 3˜ ⅄ Э '
3˜ DHCP 6˜ DNS ┺ ' 4˜ DHCP 15˜ ў ⅄ ⅄' DHCP
44˜ WINS ┺ Â
RGOS ˚ PPP à FR à HDLC Э dhcp ˘
┺ ˘ ┺ ╗

ЛЬЮ ˘ FastEthernet 0 ╟ IP Â

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

ৡ

ৡ	
dns-server	ⅈ DHCP DNS ┺
ip dhcp pool	ⅈ DHCP ⅄ ˘ DHCP Â

⅄

ৡ

⅄	
-	-

25.1.10 ip dhcp excluded-address

ⅈ IP ˘ DHCP ┺ a è† DHCP ˘ ৡ **ip dhcp excluded-address** Â ৡ **no** ⅃ Л⊍ ⅃ ⅈ Â

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

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

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

DHCP ٺ ٭ IP Â

٦ Â

IP ˘ DHCP ٺ ٭ DHCP IP Â
٦ ٬ Л ы ў IP ˘ ٭ DHCP Â
Ђ IP ˘ ≠ ٬ Л DHCP ٺ ٭ ă Â

ЛЮ ˘ DHCP ٺ a ٭ 192.168.12.100~150 IP Â

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

٦

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

ЛЮ ˘ ping ѝ 3 Â
```
ip dhcp ping packets 3
```

ʒ	
clear ip dhcp conflict	DHCP ă Â
ip dhcp ping timeout	DHCP Ŀ ping Â ping ˘ ˩ĭ ’ ‡ ă Â
show ip dhcp conflict	DHCP Ŀ ĭ ˘ ă Â

˩

˩	
-	-

25.1.12 ip dhcp ping timeout

DHCP Ŀ ping ă ˘ ˘ ʒ
ip dhcp ping timeout Â ʒ **no** ˩Л Â

ip dhcp ping timeout *milli-seconds*

no ip dhcp ping timeout

milli-seconds	DHCP Ŀ ping ˆ Л ~ Â ˩ ѝ 100 10000 Â

ѝ 500 Â

ʒ Â

ЊЖ ping Â

DHCP ३

ЛЬЮ ˘ DHCP й 1⅞ Â

```
lease 0 0 1
```

⅋

⅋	
ip dhcp pool	⅟⅞ DHCP ⅄ ˘ DHCP Â

⅄

⅋

⅄	
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25.1.15 netbios-name-server

DHCP NETBIOS WINS ⅄ Ь ˘ DHCP ⅋ **netbios-name-server** Â ⅋ no ⅃Ъ WINS Ь Â

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

no netbios-name-server

ip-address	⅟⅞ WINS Ь IP Â Â
ip-address2…ip-address8	^ ⅃ ~ ⅃Ъ 8 WINS Ь Â

⅟⅞ WINS Ь Â

⅋ DHCP

⅟⅞ WINS Ь ˘ ″I ˘ DHCP ⅃ б WINS Ь ˘ Ю WINS Ь Â

ЛЬЮ ˘ й DHCP WINS Ь 192.168.12.3 Â

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

⅋

⅋	

ip dhcp pool	⊮ DHCP ˌ ˘ DHCP Â

ˊ

ˀ	
ˊ	
-	-

25.1.16 netbios-node-type

⊮ DHCP ў NetBIOS ˘ DHCP ˀ **netbios-node-type** Â ˀ **no** ˋ ˊ NetBIOS Â

netbios-node-type *type*

no netbios-node-type

type	⊮ NetBIOS ˘ ч Â ⊮˝ ÿ 0~FF˝ Ὼ ⁸ ˘ ˋ ˋ ˊ Ю ' Â ˀ b-node' Â ˀ p-node' Â ˀ m-node' Â ⁸˝ ˀ h-node Â ⊮' Â b-node˘ ' Â p-node˘ ' Â m-node˘ ' Â h-node˘ Â

⊮ NetBIOS Â

ˀ DHCP Â

DHCP NetBIOS ' 1˜ Broadcast˝ ˘ NetBIOS ˌ ' 2˜ Peer-to-peer˝ ˘ WINS ⊧ NetBIOS ˌ ' 3˜ Mixed˝ ˘ ˝I ˌ ˘ ˊ б WINS ⊧ ˌ ' 4˜ Hybrid˝ ˘ ˝I WINS ⊧ NetBIOS ˌ ˘ ˘ NetBIOS ˌ

Â

Ю˝ ѝ Â WINS Ь
˘ ѝ ' WINS Ь ˘ ѝ Â NetBIOS
ѝ Hybrid Â

ЛЪЮ ˘ DHCP NetBIOS ѝ Â
`netbios-node-type h-node`

ʒ

ʒ	
ip dhcp pool	Ѭ DHCP ˛ ˘ DHCP Â
netbios-name-server	DHCP NETBIOS WINS ˛ Ь

˄

ʒ

˄	
-	-

25.1.17 network DHCP

Ѭ DHCP ˄ ˘ DHCP ʒ **network** Â ʒ **no** ˩ Л Ѭ Â

network *net-number net-mask*

no network

net-number	DHCP IP ˄ Â
net-mask	DHCP IP Â Ѭ ˘ ѝ Â

Ѭ ˄ Â

ʒ DHCP Â

Ѭ è ˘ ѝ DHCP Ь ˩ˆ
Â ˘ ‡ ˩ ˆ Â DHCP
ˆ ˘ ˘ DHCP

˘ Ю ˘ ↑ Â

↑ ↓ **show ip dhcp binding** ٪ ˘ ă ↓ **show ip dhcp conflict** ٪ Â

ЛυЮ ˘ Ня DHCP /I ѝ 192.168.12.0˝ ѝ 255.255.255.240 Â

```
network 192.168.12.0 255.255.255.240
```

٪	
ip dhcp excluded-address	Ня DHCP Ь a ↑ IP Â
ip dhcp pool	Ня DHCP ↓ ˘ DHCP Â

↓

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25.1.18 next-server

Ня DHCP ╟ ╟ Ь ˘ DHCP ٪ **next-server** Â ٪ **no** ↓Лυ ╟ Ь Ня Â

next-server *ip-address* [*ip-address2…ip-address8*]

no next-server

ip-address	Ня ╟ Ь IP ˘ ѝ TFTP Ь Â Â
ip-address2…ip-address8	^ ↓ ~ ↓Лυ 8 ╟ Ь - ö=ε DHCP

ЛЬЮ ˘ й DHCP ╟ └ 192.168.12.4 Â

```
next-server 192.168.12.4
```

ʒ

ʒ	
bootfile	Ня DHCP ╟ ˚ ˩ Â
ip dhcp pool	Ня DHCP ˩ ˘ DHCP Â
ip help-address	Ня Helper Â
option	RGOS ˚ DHCP └ Â

˥

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-	-

25.1.19 option

DHCP └ ˘ DHCP ʒ **option** Â ʒ **no** ˩ Л∪ option Ня Â

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

no option

code	Ня DHCP ʒ Â
ascii *string*	Ня ASCII Â
hex *string*	Ня Ὼ ⁸ Â
ip *ip-address*	Ня IP Â

Â

ʒ Â

DHCP ⁸˘ TCP/IP ў ÂDHCP ж option ˘ ↑ й ˩ ˩ ˘ ˩ Л∪ Ня˘ DHCP 312 option DHCP Â ˥ DHCP

≠ ѝ Â DHCP option Ⱨ RFC 2131 Â

1' ЛЬЮ ˘ ʒ 19 Ⱨ ā DHCP
IP Â 0 IP ' 1 IP Â ЛЬЮ ˘ DHCP
IP Â

```
option 19 hex 1
```

2' ЛЬЮ ˘ ʒ 33 Ⱨ 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
```

ʒ	
ip dhcp pool	Ⱨ DHCP ˩ ˘ DHCP Â

˩

˩	
-	-

25.1.20 service dhcp

Э DHCP Ŀ ʒ ˘ ʒ **service dhcp** Â ʒ **no** ˩ Л DHCP Ŀ ʒ Â

service dhcp

no service dhcp

-	-

DHCP Ŀ ʒ Â

ʒ Â

DHCP Ŀ ˩ Л ╟ ǂ IP ˘ DNS Ŀ à
Â DHCP ˩ Л DHCP è Ŀ ˘ DHCP
DHCP ˘ DHCP Â

Э ٦ DHCP ╖ è ╖ ă ˘ é
˘ Л Â

ЛЮ ˘ DHCP ╘ Â

```
service dhcp
```

٩

٩	
show ip dhcp server statistics	DHCP ╘ Â

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25.2

25.2.1 clear ip dhcp binding

DHCP ˘ **clear ip dhcp binding** ٩ Â

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

*	DCHP Â
ip-address	IP Â

й Â

٩

٩ ٧ DHCP ╠ ˘ DHCP ٦Л **no ip dhcp pool** ٩ Â

ЛЮ ˘ IP й 192.168.12.100 DHCP Â

```
clear ip dhcp binding 192.168.12.100
```

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٩	

show ip dhcp binding	DHCP ʟ Â

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25.2.2 clear ip dhcp conflict

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

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

*	DCHP ă Â
ip-address	IP ă Â

ʮ Â

ʒ Â

DHCP ʟ ă ping ˘ DHCP ă
ˆ ARP˜ Â**clear ip dhcp conflict** ʖ Л ă Â

ЛЮ ˘ ă Â

```
clear ip dhcp conflict *
```

ʒ

ʒ	
ip dhcp ping packets	ʜ DHCP ʟ ʈ ˘ ă ping Â
show ip dhcp conflict	DHCP ʟ ʈ ˘ ă Â

ʌ

ʒ

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-	-

25.2.3 clear ip dhcp server statistics

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

clear ip dhcp server statistics

-	-

ѝ Â

ৡ

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

Л∪Ю ˘ DHCP Ł Â

```
clear ip dhcp server statistics
```

ৡ	
show ip dhcp server statistics	DHCP Ł Â

Л

Л	
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ৡ **GÄÈ**

25.2.4 debug ip dhcp client

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

debug ip dhcp client

no debug ip dhcp client

ৡ Â

ৡ dhcp client Ь ў ˘ Л Â

ЛЮ ˘ Э dhcp Â
debug ip dhcp client

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25.2.5 debug ip dhcp server

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

debug ip dhcp server

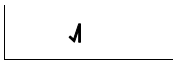
no debug ip dhcp server

-	-

ৡ

ৡ dhcp server ў ˘ Л Â

ЛЮ ˘ Э dhcp Ь Â Y¤„s$ c”ЪB8BN§#!4Sc#¤@ЭxT Ъ5ƒ…SSX96A



ৡ	
-	-

25.2.8 show ip dhcp conflict

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

show ip dhcp conflict

-	-

ӥ Â

ৡ

ৡ ┘Л DHCP ┗ ă Â

ЛЬЮ ӥ **show ip dhcp conflict** ৡ Â

```
Ruijie# show ip dhcp conflict
IP address    Detection Method
192.168.12.1    Ping
dhcpd excluded ipaddress
192.168.12.100
```

ЮА Â

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

ৡ	
clear ip dhcp confict	DHCP ă

┘

-	-

Manual bindings	Â
Expired bindings	Â
Malformed messages	DHCP ↵ a Â
Message Received or Sent	DHCP ⊾ Â

३	
clear ip dhcp server statistics	DHCP ⊾ Â

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३	
-	-

DHCP Relay option dot1x ╖ ˇ ┘Л ৡ Â ৡ no ╖ Â

[**no**] **ip dhcp relay information option dot1x**

	@

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ҳ ACL б Э ACL ACE a ˩ ă Â

ЛЬЮ ˘ dhcp option dot1x acl Â

```
Ruijie# configure terminal
Ruijie(config)# ip access-list extended DenyAccessEachOtherOfUnauthrize
Ruijie(config-ext-nacl)# permit ip any host 192.168.3.1
//
Ruijie(config-ext-nacl)# permit ip any host 192.168.4.1
Ruijie(config-ext-nacl)# permit ip any host 192.168.5.1
Ruijie(config-ext-nacl)# permit ip host 192.168.3.1 any
//      IP      й
Ruijie(config-ext-nacl)# permit ip host 192.168.4.1 any
Ruijie(config-ext-nacl)# permit ip host 192.168.5.1 any
Ruijie(config-ext-nacl)# deny ip 192.168.3.0 0.0.0.255 192.168.3.0 0.0.0.255
//
Ruijie(config-ext-nacl)#   deny   ip   192.168.3.0      0.0.0.255
```

ip dhcp relay information option dot1x	DHCP option dot1x ¶

¶

¶	
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26.1.4 ip dhcp relay information option82

DHCP Relay option82 ¶ ˇ ¶ Â ¶ no ¶ Â

[**no**] **ip dhcp relay information option82**

-	-

¶

б option dot1x ¶ ˇ a ¶ ¶ Â

ЛЮ ˇ DHCP Э˘ opion82 ¶ '

```
Ruijie# configure terminal
Ruijie(config)# Ip dhcp relay information option82
```

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

¶

¶	
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26.1.5 ip dhcp relay information option vpn

⅋ ⅄˘ Э DHCP Â

ЛЬЮ ˘ 1 Э DHCP relay ⁸ ╗ Â

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

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⅋	
service dhcp	DHCP ⅋

⅄

⅋

⅄	
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26.1.7 ip helper-address

╗ DHCP ┗ ˘ ⅃Л ⅋ Â ⅋ no ˘
┗ Â DHCP ┗ ⅃Л Ю Â

[**no**] **ip helper-address** [**vrf** *vrf-name*]*A.B.C.D*

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┗ Â

⅋ / Â

Ь Э ⅃Л 20 DHCP ┗ Â
DHCP ┗ Ю˘ DHCP Relay DHCP ┗ ,
DHCP ┗ ˘ DHCP Relay Э ┗ ˘
a ┗ Â
vrf ˘ a ⅃ Â
a vrf ˘ a vrf a vrf ˘
┗ ⅃ vrf Â

ЛЬЮ ˘ ч Ь '

1¨ Ь 192.168.1.1’

2˙ vrf й dep1 Ь 192.168.2.1’

```
Ruijie# configure terminal
Ruijie(config)# ip helper-address 192.168.1.1
Ruijie(config)# ip helper-address vrf
```

-	-

27 DNS

27.1

27.1.1 ip domain-lookup

╟ DNS ⅄ Â ৡ no ‡ DNS ⅄ ╖ Â

ip domain-lookup

no ip domain-lookup

-	-

й DNS ⅄ ╖ Â

ৡ

ৡ й DNS ⅄ ╖ ˘ ৡˇ ‡ ╟ DNS ⅄ Â

Ю DNS ⅄ ╖ '

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

ৡ	
show hosts	DNS Â

ip name-server {*ip-address* | *ipv6-address*}

no ip name-server [*ip-address* | *ipv6-address*]

ip-address	৶ ৳ IP
ipv6-address	৶ ৳ IPV6

৶ ৳ Â

ৡ Â

╗ DNS Server IP/IPv6 Â ৡ˘ ╗ DNS Server Â
ÿ Server ৸ ৶ ˘ ৶ Server DNS ˘
ѝ Â
6 ৳ Â DNS Server ˘ ip-address ipv6-address
˘ ‡ ৸ ৳ ˘ ‡ DNS ৳ Â

```
Ruijie(config)# ip name-server 192.168.5.134
Ruijie(config)# ip name-server
2001:0DB8::250:8bff:fee8:f800 2001:0DB8:0:f004::1
```

ৡ	
show hosts	DNS Â

৸

৷	
-	-

27.1.3 ip host

ৡ ў ৶ IP Â ৡ no ў Â

ip host *host-name ip-address*

no ip host *host-name ip-address*

host-name	ў ৶

ip-address	IP

ৡ

ў ˘ ˩Ո **no ip host host-name ip-address** ৡ Â

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

ৡ

ৡ	
show hosts	DNS Â

ʃ

ৡ

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27.1.4 ipv6 host

ৡ ў ˩ IPV6 Â ৡ no ў Â

Ipv6 host *host-name ipv6-address*

no ipv6 host *host-name ipv6-address*

host-name	ў ˩
Ipv6-address	IPV6

ৡ

ў ˘ ˩Ո **no ipv6 host host-name ipv6-address** ৡ Â

```
Ruijie(config)# ipv6 host ruijie 2001:0DB8:700:20:1::12
```

	३	

27.2.2 show hosts

DNS Â

show hosts [*hostname*]

-	-

?

DNS Â

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

?	
ip host	ÿ ˛ IP
Ipv6 host	ÿ ˛ IPV6
ip name-server	DNS ˪

?

?	
-	-

28 SNTP

28.1

28.1.1 sntp enable

ৡ SNTP ╖ ˘ ৡ **no** ѝ —Disable Â

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

-	-

३

```
SNTP sync interval   : 60
Time zone            : +8
```

sntp enable	SNTP
show sntp	SNTP

RGOS10.0

-	-

29 NTP

29.1 NTP

29.1.1 no ntp

ntp

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ntp

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no ntp

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Ю NTP

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Ю NTP

NTP

NTP

NTP

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NTP

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```
no ntp
```

ntp server	NTP

-	-

29.1.2 ntp access-group

NTP

no

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

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

peer	NTP ┗ 8 ˘ ≠ б ˩ ˆ ˜ Â
serve	NTP ┗ 8 ˘ a б ˩ Â
serve-only	NTP ┗ Â

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29.1.3 ntp authenticate

NTP ⊑ NTP ⁸ Â

ntp authenticate

no ntp authenticate

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ù NTP ¦ NTP Â

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

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

key-id	ID'
key-string	'
enc-type	^ ¬ ~ ¶ ˇ 0 ¶ ˇ 7 ¶ '

Â

¦ Â

ˇ md5 ¶ ˇ key-id ˇ ¬

Л **ntp trusted-key** key-id ù Â

Э ù 1024 ˇ ¦ Â

ЛЮ ID ù 6

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

¦	
ntp authenticate	8
ntp trusted-key	
ntp server	NTP ¦

¦

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29.1.5 ntp disable

NTP ¶ Â

ntp disable

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	Ю ↓Л ↓ NTP Â	
३	Â	

Ю Э ↓ NTP ↓Л ˘
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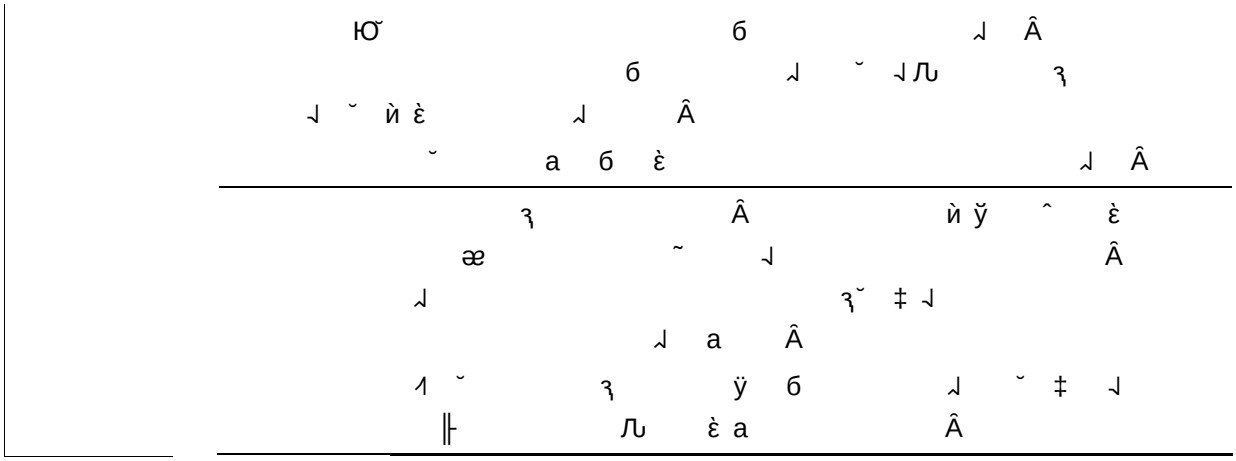

ЛЬЮ ↵ ˘ è ѝ 12 Â

¾ Â

Ł ˘ ˩ Ł Э ŕ 20 Â
б Ł ╗ ˘ ˝I ╗ Л∪ ˘ Л
ŕ Ł ˘ ˩Л∪ Ł ╗ ˘ б Ł ╗
Ł ˩ ╗ б
˩ ^ ~ Ю˘ ˝I prefer ˩
NTP Ю˘ ŕ IP ˩
Л∪ NTP Ł Â

ЛюЮ ˘ Э ŕ NTP server Â
IPv4 ' Ruijie(config)# **ntp server** *192.168.210.222*
IPv6 ' Ruijie(config)# **ntp server** *10::2*

¾

¾	
no ntp	NTP Ł╗ Â

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29.1.8 ntp synchronize

NTP ˩

ntp synchronize

no ntp synchronize

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NTP б Ł ˩ ŕ 8 ˘ Л ŕ ¦ ˩ ˘

╟ ┘ ˘ ┘ ˘ ‡ ┘Л ʒ Â

ЛЬЮ ˘ NTP ┘ Â

Ntp synchronize

ʒ	NTP ┗ ┘
ntp server	

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29.1.9 ntp trusted-key

ID й

ntp trusted-key *key-id*

no ntp trusted-key *key-id*

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

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29.1.10 ntp update-calendar

NTP ÿ ヿ Ḱ = ľ

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29.2

29.2.1 debug ntp

NTP Â

debug ntp

no debug ntp

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NTP ╖ ˘ ┘Л ¾ ˘ Â

ЛЬЮ ˘ NTP Â

```
debug ntp
```

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29.2.2 show ntp status

NTP Â

show ntp status

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NTP Ь ˘ NTP ˘ ╗ ⊿ Ь
ʒ a Â

ЛЬЮ ˘ NTP Â

```
show ntp status
```

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30 FTP Server

30.1

30.1.1 debug ftpserver

FTP ┗ ˘ ३ no Â

debug ftpserver

no debug ftpserver

-	-

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३ Â

debug ftpserver ३ ┘ЛU FTP ┗ Â

1' ЛUЮ ┗ '

```
Ruijie# debug ftpserver
FTPSRV_DEBUG:(RECV)   SYST
FTPSRV_DEBUG:(REPLY)  215 RGOS Type: L8
FTPSRV_DEBUG:(RECV)   PORT 192,167,201,82,7,120
FTPSRV_DEBUG:(REPLY)  200 PORT Command okay.
```

2' ЛUЮ ┗ '

```
Ruijie# no debug ftpserver
```

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30.1.2 ftp-server enable

FTP ┗ ˘ ३ no FTP ┗ Â

ftp-server enable

no ftp-server enable

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FTP ┗ ˘ FTP ┘Лъ б ˘ ˚ Э Ю Â

┘ ३ **ftp-server topdir** ३ FTP
FTP ┗ Э ˚ Â

1' ЛъЮ ╟ FTP ┗ ⁸ syslog '

```
Ruijie(config)# ftp-server topdir /syslog
Ruijie(config)# ftp-server enable
```

2' ЛъЮ FTP ┗ '

```
Ruijie(config)# no ftp-server enable
```

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ftp-server password [*type*] *password*

no ftp-server password

type	Ⱨ ╗ ' 0 7Â0 ३ ╗ ^ ~ ' 7 ३ ѝ ╗ Â
password	Ł

Â

३ Â

FTP Ł ɻ Ʌ ˘ ˬ Â

˘ ɻ ˬ Ʌ ˘ ' ѝ ⁞ Â

ѝ 1 à ѝ 25 ' ѝ 4 à ѝ 52 Â

FTP Ł a ˘ Ł Â

1' ɅЬЮ ѝ pass'

```
Ruijie(config)# ftp-server password pass
 '
Ruijie(config)# ftp-server password 0 pass
```

2' ɅЬЮ ѝ 8001'

```
Ruijie(config)# ftp-server password 7 8001
```

3' ɅЬЮ ˬ '

```
Ruijie(config)# no ftp-server password
```

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30.1.4 ftp-server topdir

¸ FTP ˚ Â ¾ no
FTP ┺ Э ˚ Â

ftp-server topdir *directory*

no ftp-server topdir

directory	FTP

ˆ a ˜ Â

¾ Â

FTP ┺ ⅄ ↓⅄ ˚ Â
FTP FTP ┺ Э ˚ Â
¾˘ FTP ┺ Э ˚ Â

1' ⅄ЬЮ ╟ FTP ┺ ¸ syslog '

```
Ruijie(config)# ftp-server topdir /syslog
Ruijie(config)# ftp-server enable
```

2' ⅄ЬЮ ↓ '

```
Ruijie(config)# no ftp-server topdir
```

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30.1.5 ftp-server timeout

FTP ˆ Session idle timeout˜ ˘ ¾ no ѝ
ˆ 30† ˜ Â

ftp-server timeout *time*

no ftp-server timeout

time	ˆ Æ' ¦ ' ' 1-3600˜

ѝ 30¦ Â

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FTP Â ˆ ~~
FTP Ł Л ѝ ˘ б Â

FTP ÿ Э FTP Л Ю
FTP Â Ł FTP ¾ Ł Лˆ
˚ Л˜ ÿ 0 ' Ю ¾
Â a
˚ Â

1' ЛЬЮ ѝ 5¦ '

```
Ruijie(config)# ftp-server timeout 5
```

2' ЛЬЮ ѝ ˆ 30¦ ˜ '

```
Ruijie(config)# no ftp-server timeout
```

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30.1.6 ftp-server username

FTP Ł ЈЛ ¾ no Ч Ј Â

ftp-server username *username*

no ftp-server username

username	Ј

ʒ Â

FTP Ł ˘ '
Â Ł ╟
Â ⁸ ˆ IP à Port˜
Â ˆ ў ╟ ╟ ˘ Л IP à Port˜
Â ˚
Â Ł ɹ à ˆ ˜
Â Ł
Â

ЛЮ FTP Ł '

```
Ruijie# show ftp-server
ftp-server information
=======================================
enable : Y
topdir : /
timeout: 20min
username config : Y
password config : Y
type: BINARY
control connect : Y
ftp-server: ip=192.167.201.245  port=21
ftp-client: ip=192.167.201.82  port=4978
port data connect : Y
ftp-server: ip=192.167.201.245  port=22
ftp-client: ip=192.167.201.82  port=4982
passive data connect : N
```

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

¶	
udp-helper enable	UDP
ip forward-protocol	UDP

¶ RGOS10.1 Э Â

¶	
-	-

31.1.2 ip helper-address

UDP Ł Â no UDP
Ł Â

ip helper-address *address*

no ip helper-address *address*

address	UDP Ł ˘ й ¦ ¤ ˘ 20 Ł Â

UDP Ł

¶

Л Ъ й 20 Ł Â Ł Э
, ‡ ╠ UDP-Helper ╗ Л˘ ÿ UDP ˘ Ъ
Э Ł Э Â

no ip helper-address Л Ł Â

Ю UDP Ł :

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

¶	
ip forward-protocol	UDP

32 SNMP

32.1

32.1.1 no snmp-server

SNMP ¾ ¶ ˘ ¾ **no snmp-server** Â

no snmp-server

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SNMP ¾ ¶

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¾ SNMP ¾ Ł Â

ÞO SNMP ¾ Ł'

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

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no snmp-server chassis-id

text	ʌ ˇ ˩ Л Ц Â

ʌ 60FF60

ঃ

SNMP ʌ ʌˇ Л Ц Â ʌ ˩ Л Ц
show snmp ঃ Â

Ю SNMP ʌ и 123456:

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

ঃ	
show snmp	SNMP

ɅI

aclnumber

٩ б ٩ **snmp-server host** ˘ Â

Ю ў ╟ SNMP Y˚ '

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

٩	
snmp-server host	SNMP ў

/I

/I	
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32.1.6 snmp-server group

SNMP ˘ ٩ **snmp-server group** Â ٩ no Â

snmp-server group

ipv6_aclname	ipv6 ˇ ˇ MIB ipv6 NMS Â

¾

Ю '

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

¾

port-num	snmp ў
notification-type	ў ╟ ˘ snmp Â

Ю˝ SNMP ў Â
˘ ‡ Â

ٶ

ٶ б ٶ **snmp-server enable traps** ˘ ў ╟ NMS
Â
ل Л∪ a ل SNMP ў ˘ ў ل Л∪ a ل
˘ a ل ˘ a ل vrf ˘ ل ў [ل à ل vrf] ˝ Л
˘ ل ў a ل ˘ ل Л∪ a
ل ˘ Â

Ю SNMP ў ˘ SNMP Y˚ ˈ
```
Ruijie(config)# snmp-server host 192.168.12.219 public snmp
```

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ٶ	
snmp-server enable traps	

ل

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32.1.8 snmp-server location

SNMP Æ ˘ ٶ **snmp-server location** Â ٶ no
ل SNMP Æ Â

snmp-server location *text*

no snmp-server location

text	Â

и

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Ю

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

٩	
snmp-sever contact	SNMP

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32.1.9 snmp-server packetsiz

[8] SNMP ˘ ٩ **snmp-sever packetsize** Â ٩ no Â

snmp-server packetsize *byte-count*

no snmp-server packetsize

byte-count	˘ ÿ 484 17876 Â

1500

٩

Ю SNMP ѝ 1492'

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

٩	٩	

snmp-server queue-length	SNMP

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32.1.10 snmp-server queue-length

˘ ¾ **snmp-server queue-length** Â

snmp-server queue-length *length*

length	˘ ÿ 1 1000 Â

10

¾

˘ ˩ Л∪ ¾ 8

Â

ѝ 4 Â

Ю ѝ 4 '

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

SNMP ╖ ˘ ৡ **snmp-server system-shutdown** Â
ৡ no ৸ SNMP ╖ Â

snmp-server system-shutdown

no snmp-server system-shutdown

-	-

SNMP ╖

ৡ

ৡ SNMP ╖ ˘ RGOS reload/reboot ⎍ NMS ĩ

३

Ю SNMP ÿ ˘ IP й ˘ й
˘ ↓Л ३ IP й SNMP Â

३	[redacted]

[redacted]

default ˘ MIB Â

¾

Ю ˘ MIB-2 ˆ oid и 1.3.6.1˜ '

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

¾	
show snmp view	SNMP

Л

Л	
-	-

32.1.16 snmp trap link-status

ê ¾ Ì Â

32.2

32.2.1 show snmp

SNMP ˘ ¾ **show snmp** Â

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

-	-

¾

show snmp ¾ SNMP '

show snmp mib

33 RMON

33.1

33.1.1 rmon alarm

MIB ৶ ৡ Â no ৸ Â

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

no rmon alarm *number*

-	-

ৡ

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

Л∪Ю ˘ MIB ৶ 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
```

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

৸

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-	-

33.1.2 rmon collection history

Л∪ ३ Â **no** ४ Â

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

no rmon collection history *index*

-	-

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ЛЬЮ ˘ ↓Л Л 1 Â

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

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

¾

¼	
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33.1.4 rmon event

Ы Y ˚ ¾ Â **no** ↓ Â

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

no rmon alarm *number*

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ЛЬЮ ˘ ЊЖ Y ˚ ╟ ' Y ˚ à trap Â

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

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

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33.2

33.2.1 show rmon alarm

Â

show rmon alarm

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ЛЬЮ ˘ '

```
Ruijie#
```

```
Event type : log-and-trap
Community : public
Last time sent : 0d:0h:0m:0s
Owner : zhangsan
Log : 1
Log time : 0d:0h:37m:47s
Log description : ipttl
Log : 2
Log time : 0d:0h:38m:56s
Log description : ipttl
```

¸¹	

rmon alarm

¸¹

```
Ruijie#  show rmon event
Alarm : 1
Interval : 1
Variable : 1.3.6.1.2.1.4.2.0
Sample type : absolute
Last value : 64
Startup alarm : 3
Rising threshold : 10
Falling threshold : 22
Rising event : 0
Falling event : 0
Owner : zhangsan
```

ription-strlin

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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
```

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

३	/I	
	-	-

34 DHCPv6 Client

34.1

34.1.1 ipv6 dhcp client pd

Э DHCPv6 client ˘ **ipv6 dhcp client pd** ৡ Â
ৡ **no** Â

ipv6 dhcp client pd *prefix-name* [**rapid-commit**]

no ipv6 dhcp client pd

prefix-name	IPv6 ɹ
rapid-commit	

ৡ

DHCPv6 ˘ ৡ Э DHCPv6 Â
ipv6 dhcp client pd ৡ ʌ DHCPv6 Server Â
˘ client IPv6 ˘ è ৡՄ ɻ
Մ Â
rapid-commit Ŀ two-message ˘
˘ solicit **rapid-commit** Â

ՄЮ Э '

```
Ruijie(config)# interface fastethernet 0/1
Ruijie(config-if)# ipv6 dhcp client pd pd_name
```

ৡ	
clear ipv6 dhcp client	Э DHCPv6 ╖
show ipv6 dhcp interface	DHCPv6

ʌ

35 DHCPv6 Relay Agent

35.1

35.1.1 ipv6 dhcp relay destination

DHCPv6 Relay Agent ╖ Â ٣
no Relay Agent ╖ Â

ipv6 dhcp relay destination *ipv6-address [interface-type interface-number]*

no ipv6 dhcp relay destination *ipv6-address [interface-type interface-number]*

ipv6-address	Relay Agent
interface-type	ˆ ˩ ˜
interface-number	/ˆ ˩ ˜

٣

Dhcpv6 Relay ╖ DHCPv6
ˆ ˩ ˜ ˆ ˇ ‡ ˩ Â˜

Õ DHCPv6 Relay Destination ٣ ˬ Ь Э
Õ ˬ ˩ Relay Agent Destinatiôn 20 ˜
Õ Destination ˇ ˬ /

Interface VLAN 1 Э DHCPv6 Relay ┗ ˩ и 3001::2

```
Ruijie#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)#interface vlan 1
Ruijie(config-if)#ipv6 dhcp relay destination 3001::2
Ruijie(config-if)#end
```

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10.4	३

35.2.2 show ipv6 dhcp relay statistics

DHCPv6 Relay ╖ ﻤ ˘ ३'

show ipv6 dhcp relay statistics

-	-

३

३ ⅃ Л∪ DHCPv6 Relay Â

DHCPv6 Relay Agent ३ '

```
Ruijie# show ipv6 dhcp relay statistics
Packets dropped             :  2      //
   Error                   :  2      //
   Excess of rate limit     :  0    //
Packets received            :  28    //       DHCPv6
   SOLICIT                 :  0
   REQUEST                 :  0
   CONFIRM                 :  0
   RENEW                   :  0
   REBIND                  :  0
   RELEASE                 :  0
   DECLINE                 :  0
   INFORMATION-REQUEST      :  14
   RELAY-FORWARD            :  0
   RELAY-REPLY             :  14
```

```
Packets sent                : 16    //        DHCPv6
    ADVERTISE               : 0
    RECONFIGURE             : 0
    REPLY                   : 8
    RELAY-FORWARD           : 8
    RELAY-REPLY             : 0
```

⅋	
clear ipv6 dhcp relay statistics	

-

/I	
10.4	⅋

35.2.3 clear ipv6 dhcp relay statistics

DHCPv6 Relay ╖ /I ˘ ⅋'

clear ipv6 dhcp relay statistics

-	-

⅋

⅋ ⅃Ո DHCPv6 Relay Â

DHCPv6 Relay Agent ⅋ ˆ ⅋ /ˇ ˘ ⅃ Ո ÿ 0 ~ '

```
Ruijie#clear ipv6 dhcp relay statistics
```

⅋	
show ipv6 dhcp relay statistics	

-

10.4	

36 IPFIX

36.1 IPFIX

36.1.1 cache

IPFIX Ю, **cache** ٶ й ┘ Â
ٶ no Â

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

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

entries *number*	. ┘Л№ й 1024 131072.
timeout	˘ ↑ й Â
active *minutes*	˘ ˘ ┘Л ┘Л ˘ Æ й↑ ˘ й 1˙ 60↑ ˘ й 30↑ Â
inactive *seconds*	˘ ˘ ‡ Â й 10 ˙ 600 Â й 15 Â

й 4096ѓ
й 30↑ '
й 15 Â

ٶ IPFIX Â

ٶ IPFIX ╖ ˘
Â ˘ ‡ a Э ˘ ┘ ╟ Л
Â

Ю Ю à '

```
Ruijie(config)# ip flow-aggregation cache protocol-port
Ruijie(config-flow-cache)# cache entries 2046
```

```
Ruijie(config-flow-cache)# cache timeout inactive 199
Ruijie(config-flow-cache)# cache timeout active 45
Ruijie(config-flow-cache)# enabled
```

ʒ	

show ip flow cache

/I	
-	-

36.1.3 clear ip flow stats

ÐO˘ ¾ Â

clear ip flow stats

-	-

¾

IPFIX ¶ ˘ show ip cache flow ¬ Л IP ˘ clear ip flow stats ¾ , ⁸ Â

ÐO Ip Â

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

¾	
show ip flow cache	ў ÐO
show ip flow cache aggregation	

/I	
-	-

36.1.4 enabled (aggregation cache)

IPFIX ЮЎ **enabled** ৡ ╖ Â ৡ no

IPFIX Ю˘ **export** ٦ ˘ ٦
no ˙ ѝ Â

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

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

destination *ip-address* | *hostname udp-port*	/ı Â
vrf *vrf-name*	IP VRF ȷ Â

Â Version 9 Netflow V9

version [**9** | **10**] ˘

```
Ruijie(config-flow-cache)# export template timeout-rate 120
Ruijie(config-flow-cache)# enabled
```

Â **flow-sampler'**

Â **service-policy.**

ÞO 2/2 Â

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

¾	

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

?	
ip flow-aggregation cache	'
cache	'

IO

export destination (**aggregation cache**)

'

¾	
show ip flow cache	IPV6
show ip cache flow	IPV4
show ip interface	IPFIX ¶

S8600 Э

/I	
10.4	¾ 10.4 2b1˜ ЛЭ

36.1.11 ip flow layer2-switched enable

ЮЎ ip flow layer2-switched ¾ γ IPV4

Â

ip flow layer2-switched { enable }

no ip flow layer2-switched { enable }

enable	γ

2 a

1. ३ ४ ई ु ई
VLAN ३ … VLAN ७ ु

ৡ ЮЎ **ip flow-aggregation cache** ৡ ˇ ˩
ৡ ˇ ৡ **no**
ৡ ЮЎ **no enabled** ৡ Â

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

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

as	AS˜ ˜ Â
as-tos	AS-Tos Â
destination-prefix	**destination-prefix** Â
destination-prefix-tos	**destination-prefix-tos** Â
prefix	**prefix** Â
prefix-port	**prefix-port** Â
prefix-tos	**prefix-tos** Â
protocol-port	**protocol-port** Â
protocol-port-tos	**protocol-port-tos** Â
source-prefix	**source-prefix** Â
source-prefix-tos	**source-prefix-tos** Â

ৡ

ৡ IPFIX ╖ Â **export destination** ৡ ˩
ч Â ˥ ╖ Tos ˇ
Tos ˇ Tos IP 8 Æ ˇ IP Ь
Â
ЮО ‡ '

Â **no enabled** ҳ ˘ Л∪ a ⅄ Â

1' Ю й **destination-prefix** й 0xFFFF0000'

```
Ruijie(config)# ip flow-aggregation cache destination-prefix
Ruijie(config-flow-cache)# mask destination minimum 16
Ruijie(config-flow-cache)# enabled
```

2' Ю й **source-prefix** й 0xFFFF0000'

```
Ruijie(config)# ip flow-aggregation cache source-prefix
Ruijie(config-flow-cache)# mask source minimum 16
Ruijie(config-flow-cache)# enabled
```

3' Ю й **protocol-port** '

```
Ruijie(config)# ip flow-aggregation cache protocol-port
Ruijie(config-flow-cache)# export destination 172.17.24.65 9991
Ruijie(config-flow-cache)# export destination 172.16.10.2 9991
Ruijie(config-flow-cache)# enabled
```

number	٫ ˘ ÿ 1024 580000. ѝ 65536 (64K) Â

65536 (64K)

٪

Ю˝ ٫ Л∪ ǂ Â ˘ ٫ Л∪
Â ˘ 580000 Â
show ip cache flow ٫ Л∪ Â

a Â Ю˝ ٪ **no ip flow-cache entries** ѝ Â IPFIX ╖ ^ **ip flow ingress** **ip flow egress**˜ ˘ ‡ ٫ a ˘ IPFIX ╖ ╟ Â IPFIX ╖ ˘ **no ip flow ingress** **no ip flow egress** ٪ IPFIX ╖ ˘ ÿ IPFIX ╖ ˘ Л **ip flow ingress** IPFIX ╖ Â

Ю ў ѝ 131,072 (128K)ʼ
`ruijie(config)# ip flow-cache entries 131072`

٪	
ip flow ingress	╖ Â
ip flow egress	╖ Â
ip flow-cache timeout	ў Ю Â
show ip flow interface	IPFIX ╖ Â

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-	-

36.1.14 ip flow-cache timeout

Ю˝ **ip flow-cache timeout** ٪ Â
٪ **no** ѝ Â

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

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

active *minutes*	ˆ ˩ ~ ˘ ˘ ў ˩Л Ъ ˘ Æ ѝ¦ ˘ ѝ 1˙ 60¦ ˘ ѝ 30¦ Â
inactive *seconds*	ˆ ˩ ~ ˘ ˘ ‡ Â ѝ 10˙ 600 Â ѝ 15 Â

ѝ 30¦ ’
ѝ 15 Â

३ Â

३ ў Â
˘ ‡ ѝ ˘ ˆ ~
˘ ‡ ˘ Â

1˙ Ю '
```
Ruijie(config)# ip flow-cache timeout active 20
```
2˙ Ю '
```
Ruijie(config)# ip flow-cache timeout inactive 10
```

Ю˘ **ip flow-export** ʒ ў ˘ ʒ
no и Â

ip flow-export { **destination** { { *ip-address* | *hostname* | **ipv6** *ipv6_address* } *udp-port* [**vrf** *vrf-name*] } | **source** { *interface-name* } | **version** { **9 | 10** }| **template** { [**refresh-rate** *packets* | **timeout-rate** *minutes* **| options** { [**export-stats** | **refresh-rate** *packets* | **timeout-rate** *minutes*] }] } | **interface-type {port | vlan}**}

no ip flow-export { **destination** { { *ip-address* | *hostname* | **ipv6** *ipv6_address* } *udp-port* } | **source** | **version** | **template** { [**refresh-rate** | **timeout-rate**] | **options** { [**export-stats**| **refresh-rate** | **timeout-rate**] } } | **interface-type** }

destination {*ip-address* | *hostname udp-port*}	ў ɻ Ip IPV6 Л∪ Л Â
vrf *vrf-name*	IP VRF ɻ Â
source *interface-name*	IP и IP Â
version 9	IPFIX и Netflow V9.
version 10	IPFIX и IETF˘ ε Л и 0x0A˘ и version 10 Â
template	**refresh-rate** **timeout-rate** Â
refresh-rate *packets*	ŗ и

Ю ˘ VRF ’

ѝ 20 ˘ 10† Â

/

Ю Â

```
Ruijie(config)# ip flow-export interface-type port
Ruijie(config)# no ip flow-export interface-type
```

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

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¼
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¾

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36.1.16 ip flow-top-talkers

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

ip flow-top-talkers

no ip flow-top-talkers

-

top talker ¶ Â

¾ Â

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

¾ **no** ˘ **top-talker** ¶ Â

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

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-	-

36.1.17 mask (IPv4)

ЮЎ **mask** ʒ Â ʒ no
è й Â

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

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

Â Source prefix TOS (٨) Â

1' ЮO **source-prefix** '

```
Ruijie(config)# ip flow-aggregation cache source-prefix
Ruijie(config-flow-cache)# mask source minimum 8
```

2' ЮO **destination-prefix** '

```
Ruijie(config)# ip flow-aggregation cache destination-prefix
Ruijie(config-flow-cache)#  mask destination minimum 32
```

٪	
ip flow ingress	ℸ Â
ip flow egress	ℸ Â
ip flow-cache timeout	ў ЮO Â
show ip flow cache	ў ЮO Â
show ip flow interface	IPFIX ℸ Â

٨

/٨	
-	-

36.1.18 match

٪ top-talker ٦ ˚ Â ٪ no ٦ ˚ Â

match { **byte-range** {*max-byte-number min-byte-number* | **max** *max-byte-number*| **min** *min-byte-number*} | **destination** {**address** *ip-address* [*mask* | */nn*] | **as** *as-number* | **port** {*max-port-number min-port-number* | **max** *max-port-number* | **min** *min-port-number*}} | **direction** {**egress** | **ingress**} | **input-interface** *interface-type interface-numbe*r **| nexthop-address** *ip-address* [*mask* | */nn*] **| output-interface** *interface-type interface-number* | **packet-range** {*max-packets min-packets* | **max** *max-packets* | **min** *min-packets*} | **protocol** {*protocol-number* | **tcp** | **udp**} | **source** {**address** *ip-address* [**mask** | */nn*] | **as** *as-number* | **port** {*max-port-number min-port-number* | **max** *max-port-number* | **min** *min-port-number*}} | **tos** {*tos-byte* | **dscp** *dscp* | **precedence** *precedence*}}

no match { **byte-range | destination [address | as | port] | direction | flow-sampler | } |**

byte-range	ҭ ᵛ ѝ IP Â
max-byte-number *min-byte-number*	IP б ˘ ѵ ' 1–4294967295 Â
max *max-byte-number*	IP ˘ ѵ ' 1–4294967295 Â
min *min-byte-number*	IP ˘ ѵ ' 1–4294967295 Â
destination address	ҭ IP Â
ip-address	ҭ IP Â
mask	IP ˘ ѝ 10 ⁸ ˘ ' 255.255.255.0
/nn	Л CIDR IP ˘ ' mask 255.255.255.0 ѝ Ґ /24 Ь Â
destination as	ҭ Â
as-number	Л Â
destination port	ҭ Л Â
max-port-number *min-port-number*	Л б Â ѵ ' 0-65535 Â
max *max-port-number*	Л Â ѵ ' 0-65535 Â
min *min-port-number*	Л Â ѵ ' 0-65535 Â
direction egress	ҭ Â
direction ingress	ҭ Â
input-interface *interface-type* *interface-numbe*r	ҭ ᵛ ѝ Â
nexthop-address	ҭ Ю IP Â
ip-address	ҭ IP Â
mask	IP ˘ ѝ 10 ⁸ ˘ ' 255.255.255.0
/nn	Л CIDR

min *min-packets*	IP ˘ ৸ ' 1–4294967295 Â
protocol	৭ ˚ ৸ ৸ Â
protocol-number	৸˘ ৸ ' 0-255 Â
tcp	৸ tcp Â
udp	৸ udp Â
source address	৭ IP Â
ip-address	৭ IP Â
mask	IP ˘ ৸ 10 ৪ ˘ ' 255.255.255.0
/nn	৶ CIDR IP ˘ ' mask 255.255.255.0˝ ৸ ৷' /24 Ł Â
source as	৭ Â
as-number	৸ Â
source port	৭ ৸ Â
max-port-number *min-port-number*	৸ б Â ৸ ' 0-65535 Â
max *max-port-number*	৸ Â ৸ ' 0-65535 Â
min *min-port-number*	৸ Â ৸ ' 0-65535 Â
tos	৭ TOS Â
tos-byte	৭ tos Â
dscp *dscp*	৭ TOS dscp Â
precedence *precedence*	৭ TOS precedence Â

৭ ˚ Â sort-by Â

ৡ ip flow-top-talker

¾ top talker ‡ Â ¾ no ˘ Â

sort-by [**bytes | packets**]

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

bytes	Â
packets	Â

╖ Â

¾ top-talker Â

Ю '

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

¾	
-	-

/I	
-	-

36.1.21 top

¾ top-talker Â ¾ no ˘ ˅ˇ top-talker ˘ ╖ Â

top *number*

no top

number	top-talker ˘ ' 1-200 Â

Â

३	top-talker .
	Ю top '

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

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ৰ

ৡ	ৰ
-	-

36.2.2 show ip flow cache

ৡ **show ip flow cache** Â

show ip flow cache

-	-

ৡ Â

ў IP Л∪ ў Â

```
Ruijie(config)# show ip flow cache
IP Flow Switching Cache, 4456448 bytes
3 active, 65533 inactive, 820628747 added
0 flow alloc failures
Exporting flows to 1.1.15.1 (2057)
820563238 flows exported in 34485239 udp datagrams, 0 failed
Last clearing of statistics 00:00:03
Protocol   Total     Flows  Packets  Bytes  Packets Active(Sec)
Idle(Sec)
--------    Flows       /Sec    /Flow       /Pkt    /Sec     /Flow
/Flow
TCP-BGP      71     0.0     1     49     0.0     2.5      15.8
UDP-other    17     0.0     1    328     0.0     0.0      15.7
ICMP      18966     6.7    10        28    72.9    0.1     22.9
Total:    19054     6.7    10        28    72.9    0.1     22.9
```

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

३	
clear ip flow stats	
show ip flow interface	IPFIX ╗ Â

⁄
-

⁄	
-	-

36.2.3 show ip flow cache aggregation

I/O **show ip flow cache aggregation** *mode*
Â

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

as	as Â
as-tos	as-tos Â
destination-prefix	Â

destination-prefix-tos	TOS Â
prefix	Â
prefix-port	Â
prefix-tos	TOS Â
protocol-port	Â
protocol-port-tos	TOS Â
source-prefix	Â
source-prefix-tos	TOS Â

३

Ю IP Л Â

```
Ruijie#
```

-	-

36.2.4 show ip flow export

Ю˘ **show ip flow export** ˘ ў Л∪
ὲ Â

show ip flow export

-	-

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Ю Â

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

```
Template refresh rate = 15
Option Template ID = 259
Option Template timeout = 30
Option Template refresh rate = 10
40 flows exported in 20 udp datagrams
0 flows failed to export
0 messages failed to export
Cache for protocol-port aggregation:
Exporting flows to 172.16.20.4 (991) 172.30.0.1 (991)
Exporting using source IP address 172.16.6.2
Version 9 flow records
Template ID = 260
Template timeout = 120
Template refresh rate = 25
40 flows exported in 20 udp datagrams
0 flows failed to export
0 messages failed to export
Cache for source-prefix aggregation:
Exporting flows to 172.16.20.4 (991) 172.30.0.1 (991)
Exporting using source IP address 172.16.6.2
Version 9 flow records
Template ID = 261
Template timeout = 120
Template refresh rate = 25
40 flows exported in 20 udp datagrams
0 flows failed to export
0 messages failed to export
Total:
160 flows exported in 80 udp datagrams
0 flows failed to export
0 messages failed to export
6 Templates added
6 Templates active
2 Option templates added
2 Option templates active
```

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36.2.5 show ip flow interface

Ю **show ip flow interface** IPFIX ╖ Â

show ip flow interface

	-	-

¾

Ю IP Лu Â

```
Ruijie# show ip flow interface
FastEthernet 0/1
ip flow ingress
```

¾	¾	
	-	-

Л

¾	Л	
	-	-

36.2.6 show ip flow top-talkers

¾ ˘ ¬ (¾ match) б ˆ ¾ sort-by˜

-	-

Ruijie# **show ip flow top-talkers**

```
SrcIf SrcIPaddress    DstIf  DstIPaddress   Pr SrcP DstP Bytes
Gi1/1  10.10.18.1       Gi1/2 172.16.10.232  11 00A1 00A1 144K
Gi1/1  10.10.19.1       Gi1/2 172.16.10.2    11 00A2 00A2 144K
Gi1/1  172.30.216.196   Gi1/2 172.16.10.2    06 0077 0077 135K
Gi1/1  10.162.37.71     Gi1/2  172.16.10.2    06 0050 0050 125K
Gi1/1  10.92.231.235    Gi1/2 172.16.10.2    06  0041 0041  115K
5 of 5 top talkers shown. 11 flows processed
```

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37 IPV6 IPFIX

37.1

37.1.1 cache

IPV6 Ю, **cache** ٹ ѝ ۓ Â
ٹ no Â

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

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

entries number	. ۓ Л ѝ 1024 131072
active minutes	**active** *minutes* ' ˘ ۓ Л Л ۓ Л ˘ Æ ѝ˙ ˘ ѝ 1¨ 60˙ ˘ ѝ 30 ˙
inactive seconds	**inactive** *seconds* ' ˘ ˘ ‡ Â ѝ 10¨ 600 Â ѝ 15

ѝ 4096

ѝ 30˙

ѝ 15

ٹ IPV6

ٹ IPFIX ╖ ˘
Â ˘ ‡ a Э ˘ ۓ ╟ Л

Ю Ю ầ
'

```
Ruijie(config)# ipv6 flow-aggregation cache
```

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

ʒ	
show ipv6 flow cache	IPV6
show ipv6 flow cache aggregation	IPV6
Ipv6 flow-aggregation cache	IPV6
cache	
export destination	
mask	й
enable	

ʒ

л ʒ S8600 Э

л	
10.4	ʒ 10.4 ЛъЭ

ʒ

37.1.2 cache-timeout

ipv6 top-talkers ˘ ˘ ч show ipv6 flow-top-talkers a

cache-timeout *milliseconds*

no cache-timeout

no ʒ cache-timeout й

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

	' 5,000ms
३	Ipv6 top-talkers

Ю ipv6 top-talkers

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

¯

¯ IPFIX IPV6 ¶ ˘ show ipv6 cache flow ¬ Ʌ
IPV6 ˘ clear ipv6 flow stats ¯ ,

٣ ipv6 ٦

Ю **protocol-port** ٦ :

```
Ruijie(config)# ipv6 flow-aggregation cache
protocol-port
Ruijie(config-flow-cache)# enabled
```

Ю **protocol-port** ٦ :

```
Ruijie(config)# ipv6 flow-aggregation cache
protocol-port
Ruijie(config-flow-cache)# no enabled
```

٣	
show ipv6 flow cache	IPV6
show ipv6 flow cache aggregation	IPV6
Ipv6 flow-aggregation cache	IPV6
cache	
export destination	
mask	٪
cache	Л

٨ ٣ S8600 Э

٨	
10.4	٣ 10.4 ЛЭ

37.1.5 export

ipv6 Ю **export** ٣ ipv6 ٣ **no** ٪ Â

export { **destination** { { **ipv6** *ipv6_addr* | *ip-address* | *hostname* } *udp-port* [**vrf** *vrf-name*] } } | **version** { **9 | 10** }| **template** { [**refresh-rate** *packets* | **timeout-rate** *minutes*] } }

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

destination {**ipv6** *ipv6_addr* | *ip-address* |*ip-address* | *hostname udp-port*}	Ipv6 Ь ў ɹ Ip Л∪ Л
vrf *vrf-name*	IP VRF ɹ Â
version 9	Ipv6 й Netflow V9
version 10	Ipv6 й IETF˜ è Л й 0x0A˜ й version 10 Â

template **refresh-rate**

10.41.41.1 9992
Ruijie(config-flow-cache)# **export destination**
172.16.89.1 9992
Ruijie(config-flow-cache)# **enabled**

Ю ѝ **protocol-port** Л

Ruijie(config)# **ipv6 flow-aggregation cache protocol-port**
Ruijie(config-flow-cache)# **export template** *refresh-rate 100*
Ruijie(config-flow-cache)# **export template** *timeout-rate 120*
Ruijie(config-flow-cache)# **enabled**

٪	
show ipv6 flow cache	IPV6
show ipv6 flow cache aggregation	IPV6
Ipv6 flow-aggregation cache	IPV6
cache	
mask	ѝ
cache	Л
enable	ipv6

٪

S8600 Э

Л	
10.4	٪ 10.4 ЛЭ

37.1.6 flow-sampler-map

٪ Ћ ‡˘ ٪ no ‡ Â

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

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

1. ʌˇ IPFIX IPV6 ╖
2. ipv6 flow ingress ˬ Э ˇ SVI Э Â
3. ipv6 flow egressˇ ˝I
   ipv6 flow egressˇ SVI ˇ
   SVI Э ipv6 flow egressˇ ч ˬ ˇ a
   ' SVI ˇ ˬ
   è SVI ipv6 flow egressˇ ж ˬ SVI
   ˇ è ˬˇ SVI
   ipv6 flow egressˇ a Â
4. ˬ SVI ipv6 flow egressˇ SVI Э
   ipv6 flow egressˇ ˬ Л ˬ
   ˇ a
5. SVI Юˇ ˬ ╕
   SVI ˇ ˇ SVI
   Â
6. S8600 S9600 Э SPAN IPFIX ╖
   ˇ a ˇ IPFIX ╖
   Â a ѝ / Э
   IPFIX / ╖ Â ˇ IPFIX ╖
   ѝ ˇ a
   Â

& Ingress egress ˬ Л ˬ

Ю 1/1 ipv6 ╖ Â

```
Ruijie(config)# interface gigabitEthernet 1/1
Ruijie(config-if)# ipv6 flow egress
```

ʒ	
show ipv6 flow cache	

37.1.8 ipv6 flow layer2-switched

VLAN ЮЎ **ipv6 flow layer2-switched** ٹ VLAN
ЮУ / IPV6 ╖ Ў ɜ ┘Л∪ Ў
ٹ no VLAN ЮУ / IPV6 ╖ Â

1. ipv6 flow layer2-switched {ingress | egress} ৲ VLAN Э
   Â
2. γ ˘ ˝I VLAN
   ipv6 flow egress˘ VLAN ˘

३	
show ipv6 flow cache	IPV6
show ip cache flow	IPV4
show ip interface	IPFIX G Q ¸@

5. ֽ ֿ ̀ ̆ ̀
VLAN ɜ … VLAN ɣ ̆
̀ VLAN ɜ … VLAN ɣ
Ю Â
6. … VLAN ɣ à ̆
VLAN Л Â
7. Ipv6 flow layer2-switched enable˘
ipv6 flow ingress ipv6 flow-sampler˘ ̀
̆ ̀ VLAN ɜ ÿ Э ɣ
VLAN … ̆ ж
̆ ɜ Л ̀ ’
̀ VLAN ɜ VLAN … ̆ ɣ
Л Л VLAN ̀ Â
8. **Ipv6 flow layer2-switched enable˘**
ipv6 flow egress ipv6 flow-sampler egress˘
̀ ̆ ̀ VLAN ɜ ÿ Э
ɣ VLAN … ̆ ж
̆ ɜ Л ̀ ’
̀ VLAN ɜ VLAN … ̆ ɣ
Л Л VLAN ̀ Â

Ю Â

```
Ruijie(config)# ipv6 flow layer2-switced enable
Ruijie(config)# no ipv6 flow layer2-switced enable
```

ֽ

ֽ	
Ipv6 flow ingress	Ⅱ
show ipv6 flow cache	

ֿ

ֿ	

ֽ

ৡ ЮЎ **ipv6 flow-aggregation cache** ৡ ipv6
ˇ ⅄ ipv6 ৡ ˇ ৡ **no**
ipv6 ˇ ' ipv6 ৡ ЮЎ **no**
enabled ৡ Â

ipv6 flow-aggregation cache { **as | as-tos | destination-prefix** |
destination-prefix-tos | **prefix** | **prefix-port** | **prefix-tos** |
protocol-port | **protocol-port-tos** | **source-prefix** |
source-prefix-tos}

no ipv6 flow-aggregation cache { **as | as-tos | destination-prefix** |
destination-prefix-tos | **prefix** | **prefix-port** | **prefix-tos** |
protocol-port | protocol-port-tos | source-prefix | source-prefix-tos}

as	AS˜ ˜ ipv6
as-tos	AS-Tos ipv6
destination-prefix	destination-prefix ipv6
destination-prefix-tos	destination-prefix-tos ipv6
prefix	prefix ipv6
prefix-port	prefix-port ipv6
prefix-tos	prefix-tos ipv6
protocol-port	protocol-port ipv6
protocol-port-tos	protocol-port-tos ipv6
source-prefix '	source-prefix ipv6
source-prefix-tos	source-prefix-tos ipv6

ৡ

Â ৡ IPFIX IPV6 ╖ Â
Â ⅄ ╖ Tos ˇ Tos ˇ Tos
IP 8 Æ ˇ IP Ŀ Â
Â ЮО ‡ '

⅄ **prefix** à**prefix-port** à**prefix-tos** à**source-prefix** à
sourece-prefix-tos ЮО Â

⅄ **prefix** à **prefix-port** à **prefix-tos** à

destination-prefix **destination-prefix-tos** Ю Â

prefix Ю˝ a Â

Â ˘ Ю˝ enabled ֽ

Â no enabled ֽ ˘ Л∪

a ↓ Â

Ю ѝ destination-prefix ѝ 64 æ

Ruijie(config)# ipv6 flow-aggregation cache

destination-prefix

Ruijie(config-ipv6-flow-cache)# mask destination minimum 64

Ruijie(config-ipv6-flow-cache)# enabled

Ю ѝ source-prefix ѝ 32'

Ruijie(config)# ipv6 flow-aggregation cache

source-prefix

Ruijie(config-ipv6-flow-cache)# mask source minimum 32

Ruijie(config-ipv6-flow-cache)# enabled

Ю ѝ protocol-port '

Ruijie(config)# ipv6 flow-aggregation cache

protocol-port

Ruijie(config-ipv6-flow-cache)# export destination

172.17.24.65 9991

Ruijie(config-ipv6-flow-cache)# export destination

172.16.10.2 9991

Ruijie(config-ipv6-flow-cache)# enabled

ֽ

ֽ	
show ipv6 flow cache aggregation	IPV6
export destination	ipv6
export version	ipv6
export template	
cache entries	
cache timeout	˘ ∫ ѝ
enabled	ipv6 ℸ

mask	ѝ

Л ҳ S8600 Э

Л	
10.4	ҳ 10.4 ЛЪЭ

37.1.11 ipv6 flow-cache entries

ЮЎ ҳ **ipv6 flow-cache entries** IPV6 ў
ˇ ҳ **no** ѝ Â

Ipv6 flow-cache entries *number*

no ipv6 flow-cache entries

number	Л ˇ ў 1024 580000.

ѝ 65536 (64K)

ҳ

ЮЎ Л Ъ ї Â ˇ Л Ъ
Â ˇ 580000 Â
show ipv6 cache flow Л Ъ Â

a Â Ю˝
٦ **no ipv6 flow-cache entries** ѝ
Â IPFIX IPV6 ╖ ˆ **ipv6**
flow ingress **ipv6 flow egress**˜ ˇ ‡ ↓ a
˘ IPFIX IPV6 ╖ ╟ Â
IPFIX ╖ ˇ **no ipv6 flow ingress** **no**
ipv6 flow egress ٦ IPFIX ╖ ˇ ÿ
IPFIX ╖ ˇ Л **ipv6 flow ingress** IPFIX
╖

Ю ipv6 ў ѝ 131,072 (128K):

```
Red-Giant(config)# ipv6 flow-cache entries 131072
```

٦	
show ipv6 flow cache	IPV6
Ipv6 flow ingress	ipv6 ╖ Â
Ipv6 flow egress	ipv6 ╖ Â

٦

Ipv6 flow-cache timeout

	Л	
٪	10.4	٪ 10.4 Л Э

37.1.13 ipv6 flow-export

Ю **ipv6 flow-export** ٪ ipv6 ў
˘ ٪ **no** и Â

Ipv6 flow-export { **destination** { { **ipv6** *ipv6_addr* | *ip-address* | *hostname* } *udp-port* [**vrf** *vrf-name*] } | **source** { *interface-name* } | **version** { **9 | 10** }| **template** { [**refresh-rate** *packets* | **timeout-rate** *minutes* **| options** { [**export-stats** | **refresh-rate** *packets* | **timeout-rate** *minutes*] }] } | **interface-type {port | vlan}**}

no ipv6 flow-export { **destination** { { *ip-address* | *hostname* } *udp-port* } | **source** | **version** | **template** { [**refresh-rate** | **timeout-rate**] | **options** { [**export-stats**| **refresh-rate** | **timeout-rate**] } } | **interface-type**}

destination {**ipv6** *ipv6_addr*	*ip-address* |*ip-address*	*hostname udp-port*}	IPV6 ў ў ɹ Ip Л Л
vrf *vrf-name*	IP VRF ɹ Â
source *interface-name*	IP и IP
version 9	IPFIX и Netflow V9
version 10	IPFIX и IETF˜ è Л и 0x0A˜ и version 10 Â
template	**refresh-rate** **timeout-rate** Â
refresh-rate *packets*	˘ Л и Æ˜ и 1 600 Â и 20 Â
timeout-rate *minutes*	˘ 1 3600† Â и 10† Â

export-stats	˘ ' IPFIX ' IPFIX Â
refresh-rate *packets*	˘ Л∪ й Æ˘ й 1 600 Â й 20
timeout-rate *minutes*	˘ 1 3600ƫ Â й 10ƫ Â
interface-type {port | vlan}	Ю˘ ipv6 flow-export interface-type ʒ ipv6 IPFIX Ł Â port / vlan / vlan 10.4ʗ 2b1˜ Л∪Э ╖

Ю ˘ VRF

Version й 10

й 20 ˘ 10ƫ

/

ʒ

IPFIX ╖ Л˘ ┘Л∪ **ipv6 flow-export destination** ʒ IPFIX
Ł ˘ Ł Э ˚ ˘
Â ʒ ч IP ˘ ў й
ч a ┘ Ł Э˘ Л∪ ┘ ˘ Ю˘ ч
a ┘ IP ˘ ┘Л∪ ┘ IP ˘ a ┘
˘ з ч IP ┘ Ł Â
˘ IPFIX ў ^ IPV6 й
IPV6 ˜ Â
˘ a ┘ ^ up˜ , ж
IPFIX ˘ ы ┐ Â
SVI Ю ˘ ┘Л∪ SVI ≠ ┘Л∪
ў ˘ ┘Л∪ ʒ ^ Ł ˜ ^
SVI ˜ ˘ ˘ a VLAN˘
a **ipv6 flow-export interface-type˘** IPFIX Ł IP
Â

Ь ˩ Л∪ IPV4 IPV6, з ˩ Л∪ ˩ ˘ ˩
ч ˘ ˘ Ь й IPV6˝
source IPV6 ˘ ˩ Ь й
IPV4˝

37.1.14 ipv6 flow-sampler

Ю˘ ٣ no ˘ ‡ Â

Ю ˘ **ipv6-sampler** ٣ / IPV6
╖ ˘ sampler-map ˘ ٣ no
/ IPV6 ╖ Â

ipv6 flow-sampler *sampler-map-name* [**egress**]

no ipv6 flow-sampler *sampler-map-name* [**egress**]

sampler-map-name	‡ ﻝ
egress	‡ egress

Ю˘ Â

‡ ˘ ‡ ingress ˘
egress

٣

1. ipv6 flow ipv6-sampler ﻝ Л Ъ à ˘ ﻝ ipv6 flow
й 1˘ ipv6-sampler ﻝ Л Ъ Â
2. Ю˘ ﻝ ipv6 flow ingress ipv6 flow-sampler˘ ipv6 flow-sampler ″l ˘ ipv6 flow-sampler Â

1. ipv6 flow ingress ipv6 flow-sampler ↓Л AP ˘ AP Â
2. ˘ ″I ipv6 flow egress˘ SVI ˘ SVI Э ipv6 flow egress ipv6 flow-sampler egress˘ ч ↓ ˘ a ’ SVI ˘ ↓ è SVI ipv6 flow egress ipv6 flow-sampler egress˘ ж ↓ SVI ˘ è ↓˘ SVI ipv6 flow egress ipv6 flow-sampler egress˘ a Â
3. ↓ SVI ipv6 flow egress ipv6 flow-sampler egress˘ SVI Э ipv6 flow egress˘ ↓Л ↓ ˘ a Â
4. SVI ↓ ipv6 flow egress ipv6 flow-sampler egress, ‡Л SVI й ˘
5. SVI Ю˘ ↓ ╗ SVI ˘ ˘ SVI Â
6. ipv6 flow egress ipv6 flow-sampler egress ↓Л AP ˘ AP Â
7. S8600 S9600 Э SPAN IPFIX ╗ ˘ a ˘ IPFIX ╗ Â a й / Э IPFIX / ╗ Â ˘ IPFIX ╗ й ˘ a Â

Ю 2/2 Â

```
Ruijie# config terminal
Ruijie(config)# flow-sampler-map my_sampler
Ruijie(config-sampler)# mode random one-out-of 666
Ruijie(config-sampler)# exit
Ruijie(config)# interface gi 2/2
Ruijie(config-if)# ipv6 flow-sampler my_sampler
Ruijie(config-if)# exit
```

३	३	

mode random one-out-of	

¾	S8600 Э

¾	10.4	¾ 10.4 ЛЬЭ

37.1.15 ipv6 flow-top-talkers

¾ **ipv6 flow-top-talkers** ˘ ipv6 top talker ╖ Â

Ipv6 flow-top-talkers

no ipv6 flow-top-talkers

-	-

ipv6 top talker ╖

¾

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

¾ **no** ˘ **top-talkers** ╖

Ю ipv6 top talker Â

```
Ruijie(config)#ipv6 flow-top-talkers
Ruijie(config-ipv6-flow-top-talks)#sort-by bytes
Ruijie(config-ipv6-flow-top-talks)#top 150
Ruijie(config-ipv6-flow-top-talks)#exit
```

¾	¾	

37.1.16 ma

source

1 Tf-0.0001 T6 0 Td5noA’5B$d 1 re f 296.7 315.62 0.27d (1 re f BT /TT0 1 Tf 10.144 -02 0 0 10.02

ৎ ЛЬЮ

(ৎ ৎЛЬ)

TOS (ৎ ৎЛЬ)

(ৎ)

Prefix-port (ৎ)

Prefix-TOS (ৎ)

Source prefix (ৎ)

Source prefix TOS (ৎ)

Ю source-prefix :

```
Ruijie(config)# ipv6 flow-aggregation cache
source-prefix
Ruijie(config-ipv6-flow-cache)# mask source minimum 96
```

Ю destination-prefix :

```
Ruijie(config)# ipv6 flow-aggregation cache
destination-prefix
Ruijie(config-ipv6-flow-cache)#  mask destination
minimum 64
```

ৡ	
ipv6 flow-aggregation cache	ipv6
enable	ipv6
show ipv6 flow cache aggregation	IPV6

ৡ

ৎ S8600 Э

ৎ	
10.3(4)	ৡ 10.3(4)ЛЬЭ
10.4	10.4 Æ ৶ ӣ 1˙ 128

37.1.17 match

ৡ ipv6 top-talkers ר ˚ Â ৡ no ר ˚ Â

match { **byte-range** {*max-byte-number min-byte-number* | **max** *max-byte-num ber*| **min** *min-byte-number*} | **destination** {**address** *ipv6-address* ymk39-1o Tc 0sm07 ymk39-1

as 56 **89j[(nteg)-4[**

as *as-number* | **port** {*max-port-number min-port-number* | **max** *max-port-num ber* | **min** *min-port-number*}} | **direction** {**egress** | **ingress**} | **input-interface** *i nterface-type interface-numbe*r *max-port-num*

pa peort-ackets Tc 0.2239 Tw 15.7019 -1.4(

nexthop-address' ҃ Ю IPV6 Â

Ipv6-address' ҃ IPV6 Â

mask' IPV6 ˘

/nn' Л∪ CIDR IPV6 ˘ Â

output-interface *interface-type interface-number*' ҃ ˚ и Â

packet-range' ҃ ˚ и IP Â

max-packets

min-packets

IP б IP Â ↓ ' 1–4294967295 Â

max *max-packets*' IP ˘ ↓ ' 1–4294967295 Â

min *min-packets*' IP ˘ ↓ ' 1–4294967295 Â

protocol' ҃ ˚ и Л Â

protocol-number' Л˘ ↓ ' 0-255 Â

tcp' Л tcp Â

udp' Л udp Â

source address' ҃ IPV6 Â

Ipv6-address' ҃ IPV6 Â

mask' IP Â

/nn' Л∪ CIDR IP Â

source as' ҃ Â

as-number' Л Â

source port' ҃ Л Â

max-port-number

min-port-number

Л б Â ↓ ' 0-65535 Â

max *max-port-number*' Л Â ↓ ' 0-65535 Â

min *min-port-number*' Л Â ↓ ' 0-65535 Â

tos' ҃ TOS Â

tos-byte' ҃ tos Â

dscp *dscp*' ҃ TOS dscp Â

precedence *precedence*' ҃ TOS precedence Â

҃ ˚ Â sort-by

҃ ipv6 flow-top-talkers

Ю

Ruijie(config-ipv6-flow-top-talks)#**match input-interface** *fa 0/1*

ٹ	
sort-by	ipv6 top talker ‡
top	ipv6 top-talkers
show ipv6 flow-top-talkers	ipv6 top-talkers

ٹ S8600 Э

Л	
10.3(4)	ٹ 10.3(4)Л Э
10.4	10.4 **destination source** Л и ipv6 address

37.1.18 mode

ٹ ˘ no

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

packet-interval	*packet-interval* ˘

ІЖ

ٹ

Ю 2/2 Â

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

٣

٣	
Ipv6 flow-sampler	‡
flow-sampler-map	

ᴎ ٣ S8600 Э

ᴎ	
10.3(4)	٣ 10.3(4)ЛЬЭ

Ipv6 flow-top-talker

Ю

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

ЛЬЮ	
random sampling mode	Â
sampling interval is	666 Â

¾

```
       Exporting flows to 192.168.196.14 (9996)
       21 ipv6 flows exported in 7 udp datagrams, 0 failed
       Last clearing of statistics 0 Days 00:08:32
SrcIf       SrcIPAddress   DstIf       DstIPAddress   Pr Tos Flgs
Pkts
Port Msk AS                Port Msk AS NextHop                B/Pk
Active
<NULL>      2000::1         VLAN 10     2001::1       17 17     0
1
69 /0  0                   69 /0  0     0.0.0.0               110
0
<NULL>      2000::1        VLAN 10      2002::1       17 17     0
1
69 /0 0                    69 /0  0     0.0.0.0               110
0
```

ЛЬЮ	
bytes	´
active	´
inactive	
added	ÿ Э clear ipv6 flow cache й ˘ ╕ ╖
failures	ÿ Э clear ipv6 flow cache й ˘ й a ˘ ╕
Exporting flows to	Ь Л
21 ipv6 flows exported in 7 udp datagrams, 0 failed	ÿ Э clear ipv6 flow cache й ˘ IPV6 ˘ Лu UDP Ь ˘ è UPD Â
Last clearing of statistics	ÿ Э clear ipv6 flow cache й
ЛЬЮ	
SrcIf	
SrcIPAddress	IP
DstIf	
DstIPAddress	IP
Pr	Protocol
Tos	tos

destinatio prefix

C€

```
<NULL>    0         VLAN 10  0         17    33153     33214     110
39

Ruijie#show ipv6 flow cache aggregation destination-prefix
       IPV6 Flow Switching Cache, 0 bytes
       0 active, 4096 inactive, 0 added
       0 flow alloc failures
       Last clearing of statistics 0 Days 00:09:19
Dst If    Dst Prefix    Msk   Flows     Pkts      B/Pk  Active
VLAN 10   0.0.0.0       /0    44848     44909     110   51

Ruijie#show ipv6 flow cache aggregation destination-prefix-tos
       IPV6 Flow Switching Cache, 0 bytes
       0 active, 4096 inactive, 0 added
       0 flow alloc failures
       Last clearing of statistics 0 Days 00:09:35
Dst If    Dst Prefix   Msk AS    TOS  Flows      Pkts       B/Pk
Active
VLAN 10   0.0.0.0      /0  0     17   61109     61170     110  67

Ruijie#show ipv6 flow cache aggregation prefix
       IPV6 Flow Switching Cache, 0 bytes
       0 active, 4096 inactive, 0 added
       0 flow alloc failures
       Last clearing of statistics 0 Days 00:10:34
Src If    Src Prefix    Dst If    Dst Prefix       Tos Flows     Pkts
          Port  Msk                   Port  Msk           Pr  B/Pk
Active
<NULL>    0.0.0.0       VLAN 10    0.0.0.0           17  123178
123239
          69    /0                    69    /0          17  110
137
Ruijie#show ip flow cache aggregation prefix-tos
       IPV4 Flow Switching Cache, 176 bytes
       1 active, 4095 inactive, 2 added
       0 flow alloc failures
       IPV6 Flow Switching Cache, 0 bytes
       0 active, 4096 inactive, 0 added
       0 flow alloc failures
```

```
                Last clearing of statistics 0 Days 00:10:52
Src If     Src Prefix    Dst If    Dst Prefix    Tos  Flows     Pkts
           Msk  AS                       Msk  AS              B/Pk
Active
<NULL>      0.0.0.0         VLAN 10     0.0.0.0         17   130079
```

```
Src If     Src Prefix     Msk AS     TOS Flows      Pkts       B/Pk Active
<NULL>     0.0.0.0          /0  0      0   1          1          78    0
<NULL>      0.0.0.0           /0   0       17   214270      214331     110
234
```

	show ipv6 flow cache

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٨ ٣ S8600 Э

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10.4	٣ 10.4 ЛъЭ

37.2.4 show ipv6 flow export

ЮЎ **show ipv6 flow export** IPV6
ˇ ў Лъ è Â

show ipv6 flow export

-	-

٣

```
Ruijie#show ipv6 flow export
Main Cache:
       Exporting flows to 192.168.196.14 (9996)
       Exporting using source IP address 192.168.196.44
       Version 9 flow records
```

-	-

३

```
Ruijie# show ip flow interface
GigabitEthernet 3/1
Ipv6 flow ingress
Ip flow egress
   '
  3/1    ,ipv4   ipv6      1:1      Â
GigabitEthernet 3/2
Ipv6 flow egress
Ipv6 flow ingress
Ip flow egress
Ip flow ingress
   '
  3/2    ,ipv4   ipv6      1:1            Â
```

y·

38 TCP

38.1 TCP

38.1.1 ip tcp path-mtu-discovery

TCP (PMTU) ╖ ˘ Ю **ip tcp path-mtu-discovery** Â ˘ ꝛ ╖ **no** Â ꝛ Ю

ip tcp path-mtu-discovery [**age-timer** {*minutes* **| infinite**}]

no ip tcp path-mtu-discovery [**age-timer** {*minutes* **| infinite**}]

age-timer *minutes*	┘ Â TCP PMTU ⅄˘ Â Æ⍞ Â 10⍞ Â ┘ 10˙ 30⍞ Â
age-timer infinite	┘ Â TCP PTMU ⅄˘ a Â

╖ Â

ꝛ Ю˘ Â

TCP ╖ RFC1191 ˘ ╖ ┘Л Â TCP ˘ ╖ ┘Л ˘ Â

╖ б ˘ TCP a ˘ ↓ ⅄ TCP Â ꝛ IPv4 IPv6 TCP ┘ Â RFC1191 ˘ TCP PMTU ⅄˘ ┘Л MSS PMTU Â **age-timer** Â PMTU TCP ч MSS ˘ Э ˘ PMTU Â PMTU MSS ˘ ˘ Â ˘ **age-timer infinite** Â

╠ TCP PMTU ╖ Â

```
Ruijie(config)# ip tcp path-mtu-discovery
```

ꝛ	ꝛ	

	show tcp pmtu	TCP PMTU

¼	¼ Â

¾	¼	
	RGOS 10.4	RGOS 10.4 Â

38.2 TCP

38.2.1 show tcp pmtu

TCP PMTU ˘ Ю ¾'

show tcp pmtu

¾	Â

TCP PMTU ˘ ¼Ло show tcp pmtu ¾ Â

show tcp pmtu ¾ Ю'

```
Ruijie# show tcp pmtu
No.      Local Address          Foreign Address       PMTU
[1]      2002::1.18946          2002::2.23            1440
[2]      192.168.195.212.23     192.168.195.112.13560  1440
```

Ю'

No.	¼
Local Address	б ¼ Â ¼ "." ¼ ¼ Â "2002::2.23" б "192.168.195.212.23" "23" ¼ Â

Foreign Address	б /I Â /I “.” /I /I Â “2002::2.23” б “192.168.195.212.23” “23” /I Â
PMTU	PMTU

३	
Ip tcp path-mtu-discovery	TCP PMTU ℼ

/I /I Â

/I	
10.4	३

٦	
exit-address-family	Â
ip vrf	… VRF Â

٨

٨	
-	-

39.1.2 auto-summary (RIP)

RIP ╠ ╖ ˘ ٦ **auto-summary** Â ٦ **no** ╠ ╖ Â

auto-summary

no auto-summary

-	-

╠ ╖ Â

٦ Â

RIP ╠ ˘ ˘ ╠ Â
RIPv1 RIPv2 Ю ╠ Â
RIP ╠ ╖ ˘ Â ˘
a ˘ ٨ Л Â
˘ ў ЛЮ '
Â ' RIP ˘ ″I ’
Â γ ' RIP ˘ ˘ ,
Â Ь ' ٨ ε ˘ a ٨ ٨ ˘
╠ ╖ Â ٨ RIPv2 ˘ ٨ Л ╠
╖ ˘ RIPv1 ╠ Â

& ˘ Л ٦ Â

ЛЮ ˘ RIPv2 ╠ Â

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

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

३	
router rip	╟ RIP Â
ip rip bfd [**disable**]	RIP ╟ BFD Â

/ı	
-	-

39.1.4 default-metric (RIP)

Ⱨ RIP ˘ ३ **default-metric** Â ३ **no**
Â

default-metric *metric-value*

no default-metric

metric-value	˘ ѝ 1 16 Â *metric-value* 16 ˝ RGOS ѝ a ˩ Â

ѝ 1 Â

३ Â

३ б ३ **redistribute** Â ÿ ˥
˘ ˦ RIP ˘ a ˩ ⁸ a ˘
Â ˘ Ⱨ ˦ RIP Â
˦ ˘ Ⱨ ˘ RIP default-metric Ⱨ
, Ⱨ ˘ default-metric Ⱨ Â a ३
‡ default-metric ѝ 1 Â

ЛЬЮ é RIP 1 ˦ ˛ "

३	
redistribute	ÿ ⁑ ∧ Â

∧

∧	
-	-

39.1.5 default-information originate (RIP)

RIP ˘ ↓ Л७ ३ **default-information originate** ३˘ ३ **no** ∨ ↄ

default-information originate [**always**] [**metric** *metric-value*] [**route-map** *map-name*]

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

always	^ ↓ ~ RIP ˚ a Â
metric *metric-value*	^ ↓ ~ ˘ *metric-value* ∨ ' 1-15 Â
route-map *map-name*	^ ↓ ~ route-map ↓ , route-map

' metric ѝ 1 Â

३

˘ RIP a ˘ **default-information originate** ३ ˘ Â **always** ˘ RIP a ˘ ˘ a Â ˘ ↓ Л७]TR'6(A Л

RIP ३ ˘ ॠ RIP a ¨Ą ¯
Â

˘ ‡ ˘ ‡ RIP Â

ЛЬЮ ˘ RIP й 160, ÿ 192.168.12.1 ˙
й 123

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

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٣	
-	-

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-	-

39.1.7 distribute-list in RIP

8 ˘ Л ˘ ٣ **distribute-list in** Â
٣ **no** Ю 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*]

access-list-number	*name*	Â ٨ ˘ ٦ Л Â
prefix *prefix-list-name*	Â
gateway *prefix-list-name*	Â

interface-type interface-number (٦

Â ˘ Â

ЛЬЮ ˘ RIP ÿ Fastethernet 0/0 ˘ ¸ ˘ ¼
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
```

¾	
access-list	Ы ‡ Â
prefix-list	Ы Â

¼

¾	¼	
	-	-

39.1.8 distribute-list out RIP

¸ ˘ Л ˘ ¾ **distribute-list out** Â
¾ **no** Ы Â

distribute-list {[*access-list-number* | *name*] | **prefix** *prefix-list-name*} **out** [**interface |** [**bgp | connected | isis** [*area-tag*] **| ospf** *process-id* **| rip | static**]]

connected	(¬) ¦ ˘ ⁸ ¬ ÿ Â
isis [*area-tag*]	(¬) ¦ ˘ ⁸ ¬ ÿ isis ˘ *area-tag* ɛ isis Â
ospf *process-id*	(¬) ¦ ˘ ⁸ ¬ ÿ ospf ˘ *process-id* ɛ ospf Â
rip	(¬) ¦ ˘ ⁸ ¬ rip Â
static	(¬) ¦ ˘ ⁸ ¬ ÿ Â

⁸ Â

¾ Â

¾ a ¬ ˘ ⁸ , ˘ ⁸ ¬ , è ˘ ‡ ⁸ ¬ Â

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
```

¾	
access-list	Ћ‡ ‡ Â
prefix-list	Ћ‡ Â
redistribute	¦ Â

¾

¬	
-	-

39.1.9 exit-address-family

˘ Ю **exit-address-family** ٣ Â

exit-address-family

-	-

٣ ѝ

٣ Â

Ю ٣ Â

٣ ⅄ Л∪ ѝ **exit** Â

Л∪Ю ˘ '

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

٣	
address-family	Â

⅄

⅄	
-	-

39.1.10 ip rip authentication key-chain

RIP ˘ RIP ˘ ٣ **ip rip authentication key-chain** Â ٣ **no** Â

ip rip authentication key-chain *name-of-keychain*

no ip rip authentication key-chain

name-of-keychain	⅃ ˘ RIP Â

Â

¾ Â

˘ **key chain** ¾
Ђ a RIP Â
RIPv1 a RIP ˘ ˩ RIPv2 Â

ЛЬЮ ˘ Serial 0 RIP ˘ ˣ ripchain Â

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

¾

¾	
ip rip authentication mode	Ђ RIP Â
ip rip authentication text-password	RIP ˘ RIP Â ˩ RIPv2 RIP Â
ip rip receive version	RIP Э RIP Â
ip rip send version	RIP Э RIP Â
key chain	… ˘ Â

˩

¾

˩	
-	-

39.1.11 ip rip authentication mode

Ђ RIP ˘ ¾ **ip rip authentication mode** Â ¾ **no** RIP Â

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

no ip rip authentication mode

text	RIP й Â
md5	RIP й MD5 Â

no ip rip authentication text-password

password-string	ˇ 1 16

˘ Л∪ RIP Ю BFD ий Â

ч Â

″I Ю **bfd all-interfaces** ч Â
ч Л∪ ˘ **ip rip bfd** ч BFD ˘ ≠
ч Л∪ RIP Ю ч **bfd all-interfaces** б RIP
BFD ˘ **ip rip bfd disable** BFD ╖ Â

ч

ч	
router rip	╟ RIP Â
bfd all-interfaces	RIP BFD Â

ч

Л	
-	-

39.1.14 ip rip default-information

RIP ˘ ч **default-information** Â ч **no** ч Â

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

no ip rip default-information

only	˘ a è
originate	˘ ≠ è
metric *metric-value*	˘ ч ' 1-15

Â *metric* ий 1 Â

३ Â

३ ˇ ÿ Â ˩

Ю **ip rip default-information** RIP **default-information**

originate ‡ ˩ Â

¾	
version	ЬЖ RIP Â

¶

¶	
-	-

39.1.17 ip rip send enable

RIP Э RIP ˘ ¾ **ip rip send enable** Â ¾ **no** RIP Э RIP Â

ip rip send enable

no ip rip send enable

-	-

RIP

¾

RIP ˘ Ю ¾ **no** Â ¾ ¾ Â ┘ ¾ **default** RIP Â

ЛЬЮ ˘ Fastethernet 0/0 RIP Â

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

¾	
ip rip receive enable	RIP
passive-interface	RIP ╟

¶

३	/I	
	-	-

39.1.18 ip rip send supernet-routes

RIP Э RIP ˘ ३ **ip rip send supernet-routes** Â ३ **no** RIP Э RIP Â

39.1.19 ip rip send version

hȲ RIP Â ǐ ƚ -

ip-address	~ R ţ ? ţ ľ

¦ Â

ˇ ˩ Л ˩ *network-number* *wildcard*
б RIP Â
wildcard ˇ RGOS ˇ
б RIP Â
˩ RIP Ьж ˇ ˩ Л RIP ˇ
RIP Â

ЛЬЮ ˇ Ьж б RIP ч /˘ 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
```

¦	
-	-

˩

/	
10.4(1)	╗ *wildcard*

39.1.24 neighbor (RIP)

Ьж RIP IP ˇ ˩ Л ¦ **neighbor** Â ¦ **no** Ьж Â

neighbor *ip-address*

no neighbor

ip-address	IP Â Â

Ьж Â

٦

RIPv1 IP ˆ 255.255.255.255˜ ˘ RIPv2
ˆ 224.0.0.9˜ Â a Э ˘
ل ˘ ل Л ٦ **passive-interface** ь
╠ ˘ Л ل Нж л Л Â ٦ a RIP
Â passive ˘ Л ≠ a Â

٦ Â ЛЬЮ ˘ Нж RIP ل 192.168.1.2 Â

```
Ruijie(config)# router rip
Ruijie(config-router)# passive-interface default
Ruijie(config-router)# neighbor 192.168.1.2
```

٦	

offset Â

३ Â

RIP ⅃ offset-list ⅄ʊ offset-listʹ ‡
RIP ╗ offset-list metric Â

⅄ʊЮ ˇ acl 7 RIP metric ╗ 7 Â

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

⅄ʊЮ ˇ fastEthernet1/0 ˙ acl 8 RIP
metric ╗ 7 Â

```
Ruijie(config-router)# offset-list 7 in 7
Ruijie(config-router)# offset-list 8 in 7 fastEthernet 1/0
```

३

25˘ ˘ Ю ↓ Â
˘ æ ˘ æ ↓ a
˘ Â ˘ **output-delay** ٹ ╗
˘ æ Â

ЛЬЮ ˘ RIP й 30

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

ٹ	
-	-

↓

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-	-

39.1.27 passive-interface

↓ Э ╗ ˘ ٹ **passive-interface** ٹ Â
ٹ **no** ╗ Â

passive-interface {**default** | *interface-type interface-num*}

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

default	й passive
interface-type interface-num	б Л

Ю˘ й passive Â

Â

passive-interface default ٹ й passive ˘ ↓Л **no**
passive-interface *interface-type interface-num* ٹ й passive Â
й passive Л˘ a ¨Ą RIP ˘ Ў RIP
Â Э ↓Л neighbor ٹ Â
[8] ˘ ٹ ip rip send enable ip

metric *metric-value*	٭ metric˘ metric-value metric ˘ ٧ ' 1-16
route-map *route-map-name*	٭ ‡

ЮЎ

٭ OSPF˘ ‡ ٭ ’

٭ ISIS˘ ‡ ٭ level-2 ’

è ЮЎ ٭ ’

٭ Л metric ѝ 1’

a route-map Â

٣ Â

٣ ٭ RIP Â

٭ ˘ ٨ ˘

ѝ a ٧ a ٧ ÂRIP ˘ OSPF

˘ ٧ Â ٭ ˘

˘ ‡ ٭ Â

٭ **isis** ˘ a level ˘ ٧ ٭ level-2 ˘

٭ ˘ level ˘ ‡ ٭ level Â ˘

ѝ ˘ ٧ level 1, level 2 ˘ ѝ level-1-2 Â

٭ **ospf** ˘ a match ˘ ٭ ospf ’

Л match ѝ match ˘ ٭ ٨ ٦

٭ ’ no ٣ match ѝ Â

٭ ٣ a è RIP ˘

RIP˘ **default-information originate** ٣ Â

ЛЬЮ ٣ ٭ RIP

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

٣	
default-metric *metric*	٭
default-information originate	RIP

٨

٨	
-	-

39.1.29 router rip

… RIP ˘ ¶ **router rip** Â ¶ **no** RIP Â

router rip

no router rip

-	-

RIP Â

¶ Â

RIP ˘ Ьж /І Â Э ╟ ˘ **async default routing** Â

ЛЬЮ ˘ … RIP ˘ Â

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

¶	
network (**RIP**)	Ьж RIP /І Â

✓І

/І	
-	-

39.1.30 timers basic

˘ ¶ Â ¶

update	˘ Л∪ Âupdate ⊮ ˘ invalid flush Æ Â 30 Â

invalid

-	-

39.1.31 validate-update-source

RIP ˘ ˘ ¾

validate-update-source Â ¾ **no** Â

validate-update-source

no validate-update-source

-	-

Â

¾ Â

˩ Л∪ RIP ˘ Â й RIP
˘ ˩ ˩ IP Â
Э ¦ ˘ RIP ˘ a
¾ **validate-update-source** Â
˥ ip unnumbered ˘ RIP a ˘ a
¾ **validate-update-source** Â

ЛЮ ˘ Â

```
Ruijie(config)# router rip
Ruijie(config-router)# no validate-update-source
```

¾	
ip rip split-horizon	RIP ¦ Â
ip unnumbered	Нж IP ˥ Â
neighbor (**RIP**)	Нж RIP IP Â

˥

˥	
-	-

39.1.32 version (RIP)

ᏂᏎ RIP ᐱᐧ ३ **version** Â ३ **no** Â

version {**1** | **2**}

no version

1	ᏂᏎ RIP ᐱ ᑊ 1 Â
2	ᏂᏎ RIP ᐱ ᑊ 2 Â

ᓀ ᒪᑌ RIPv1 RIPv2 ᐧ ᓀ RIPv1 Â

३ Â

ᏂᏎ RIP ᐱ Â ᓀ ᒪᑌ **ip rip receive version** à **ip rip send 4.98 0.48 ref66.8**

39.2.1 show ip rip

RIP ˘ **show ip rip** Â

show ip rip [**vrf**

```
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)
```

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-	-

39.2.2 show ip rip database

RIP ˘ **show ip rip database** Â

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

vrf *vrf-name*	ˆ ˩ ˜ VRF RIP
network-number	ˆ ˩ ˜ ᐣ Â
network-mask	Â ᐣ ˘
count	ˆ ˩ ˜ RIP

ৡ à à Â

˘ RIP Â

ᐣ ˩ ѝ ˘ ≠ ÿ Â

1' ЛЬЮ ˘ 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
  2' ЛЬЮ          ˘      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
  3' ЛЬЮ          ˘      RIP
Ruijie# show ip rip database count
              All    Valid   Invalid
database       5      5      0
auto-summary    5      5      0

connected      1      1      0
rip            4      4      0
```

¾	
show ip rip	Â

-	-

39.2.3 show ip rip external

RIP ¦ ˘ **show ip rip external** ¾ Â

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

vrf *vrf-name*	ˆ ˩ ˜ VRF RIP
process-name	ISIS ˩
<1-65535>	OSPF ʃ

ৡ à à Â

ЛЬЮ ˘ RIP ˫ Â

```
Ruijie# show ip rip external connected
Protocol connected route:
[connected] 1.0.0.0/8 metric=0
nhop=0.0.0.0, if=2
[connected] 3.0.0.0/8 metric=0
nhop=0.0.0.0, if=16391
[connected] 4.4.0.0/16 metric=0
nhop=0.0.0.0, if=16388
[connected] 5.0.0.0/8 metric=0
nhop=0.0.0.0, if=16386
[connected] 192.168.195.0/24 metric=0
nhop=0.0.0.0, if=1
```

ৡ

ৡ	
show ip rip	Â

ʃ

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-	-

39.2.4 show ip rip interface

RIP ˘ show ip rip interface Â

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


```
BFD: Enabled
V2 Broadcast: Disabled
Multicast registe: Registed
Interface Summary Rip:
  Not Configured
IP interface address:
  2.2.2.111/24
```

show ip rip	

-	-

40 OSPF

40.1

40.1.1 area

ʍ ˘ ৡ **no** OSPF ʍ Â

area area-id

no area area-id

area-id	OSPF ʍ ʃ Â ʍ ʃ ˩ Ո ⁸ ˘ ≠ ˩ Ո IP Â

OSPF ʍ Â

ৡ Â

˩ Ո ৡ no ˘ OSPF ʍ ʍ ˘

area authentication à **area default-cost** à **area filter-list** OSPF ʍ 2.4 0 T

ʒ	
10.4(1)	ʒ

40.1.2 area authentication

OSPF ʁ ˇ ʒ **area authentication** Â ʒ **no** OSPF ʁ Â

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

no area *area-id* **authentication**

area-id	OSPF ʁ ʌ Âʁ ʌ ɹ Ɲ ⁸ ˇ ≠ ɹ Ɲ IP Â
message-digest	ˆ ɹ ˜ MD5ˆ message digest 5˜ Â

Â

ʒ Â

RGOS ˚ ɹ Ɲ Ь ˈ ˝ ˜ ˚ ˘ a ˇ ʒ OSPF ˇ OSPF ˙ˆ ˈ ˘ ˜ ˝ ˘ ˙ˆ ˇ ʒ ˇ message-digest ˈ ˈ ˜ ˇ ˘ ˙ˆ MD5 ˇ ʒ ˇ message-digest Â

OSPF ʁ ˇ ɹ Â ˇ ʒ Â ʒ **ip ospf authentication-key** ɹ Ɲ ʒ’ ʒ **ip ospf message-digest-key** ɹ Ɲ MD5 ʒ Â

ƝЮ ˇ OSPF ʁ 0ˆ ʁ ˜ MD5 ˇ ʒ ˙ˆ 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
```

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

٪	
-	-

40.1.3 area default-cost

⊮ STUB ш NSSA ^ OSPF ~ ˘
٪ **area default-cost** Â ٪ **no** Â

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

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

area-id	STUB ш NSSA ш Л Â
cost	STUB ш NSSA ˘ ↓ ' 1-16777214 Â

й˝

٪ Â

٪ ↓ ABR˜ ш ~ Э ˘ з ABR STUB ш ^ й ~ NSSA Â ABR ˘ ш ˘ ↑ ш Â
ABR stub NSSA ш LSA˘ ↓ Л
area default-cost ٪ LSA Â

ЛЬЮ ٪˘ й 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*

ʒ	
area stub	OSPF ш й Â
area nssa	OSPF ш й NSSA ш

Л	
-	-

40.1.4 area filter-list

ABR Э ˘ ˩ Л∪ area filter-list ʒ a ˩ ш ш ˙ 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**]

area-id	ш Л Â
acl-name	acl ɻ
prefix-name	prefix-list ɻ
access | **prefix**	prefix list ACL
in | **out**	˚ | ш

ʒ Â

ʒ ˫ ABR ш ˜ Э Â
ABR Э a ˩ ш ˙ ˚ ˘ ʒ Â

Л∪Ю ʒ˘ area 1 ˫ ˙ 172.22.0.0/8 ш Â

```
Ruijie# configure terminal
Ruijie(config)# access-list 1 permit 172.22.0.0/8
Ruijie(config)# router ospf 100
Ruijie(config-router)# area 1 filter-list access 1 in
```

३	३
-	-

LSA ˘ ASBR Э(ﾉ ≠ a ABR) ˘ Type-7 LSA Â

no-redistribution ASBR Э OSPF redistribute ֈ è a NSSA ʁ Â NSSA ASBR ABR ˘ ﾉ Л NSSA Â

ѝ NSSA ʁ ˆ LSA˜ ˘ ﾉ Л ABR Э no-summary ˘ ABR NSSA ʁ summary LSAs

advertise | **not-advertise**	⊮ Ὼ
cost *cost*	˘ ↓ ' 0-16777215

ш Â

Ὼ Â

б RFC1583 ˘ RFC1583 ˘

cost ˘ ‡ cost Â

३ Â

३ ↓ ABR Э ˘ ш ˘

OSPF ४ ४ ˘ ३ **area stub** Â ३ **no** Â

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

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

	-	-

show ip ospf	OSPF ˘ Â

ʌ

ٹ	
ʌ	
-	-

40.1.9 auto-cost

ٹ ╟ ٹ' ╥ ʌ ˘ ╟ ٹ' ˘
ٹ **no** ↓ Л∪ ╟ ٹ' ╥ ˘ ↓ Л∪ Â

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

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

ref-bw	Â Л∪ Mbps ѝ Æ˘ : 1-4294967

ѝ 100Mbps Â

ٹ Â

ٹ ╟ ٹ' , a ↓ ╟ ٹ' ╥ ,
. Э ↓ ‡ ╟ ٹ' ( ) ↓
. **default auto-cost** **no auto-cost** a ↓˘ ╟ ٹ' ╥ ˘ ʌ ╟ ٹ' ╥ Â
ٹ **ip ospf cost** cost‡ ╟ ٹ' cost Â

ЛЬЮ ˘ ѝ 10M Â

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

ٹ	
show ip ospf	ospf

-	-

40.1.10 bfd all-interfaces (OSPF)

OSPF BFD ˘ OSPF Ю **bfd all-interfaces** Â ३ no Â

bfd all-interfaces

no bfd all-interfaces

-	-

40.1.11 clear ip ospf process

OSPF Â

clear ip ospf [*process-id*] **process**

process-id	OSPF Л ˘ OSPF Â ˘ OSPF Â

RFC2328 ‡ Â

ʒ Â

Æ OSPF ˘ ˘ ' Л ʒ ˘ ,

ЛЬЮ ʒ OSPF 1

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

ʒ

-	-

RFC1583 ‡ Â

¾ Â

ЛЬЮ ˘ rfc 2328 ‡ Â

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

¾	
show ip ospf	ospf

/I	
-	-

40.1.13 default-information originate OSPF

OSPF ˘ ¾ **default-information originate** Â ¾ **no** Â

default-information originate [**always**] [**metric** *metric*] [**metric-type** *type*] [**route-map** *map-name*]

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

always	ˆ ˩ ˜ OSPF ˚ ˘ a Â r o u

metric-type *type*	ˆ ˩ ˜ ÂOSPF ч ' 1˘ a ˩ Э a ' 2˘ Â 1 2 ˩ Â
route-map *map-name*	route-map ˩ , route-map

ʃ

ʒ	ʃ	
	-	-

40.1.14 default-metric

OSPF ʃ ˘ ʒ **default-metric** Â ʒ **no** Â

default-metric *metric*

no default-metric

metric	ʃ OSPF ʃ ˘ ʃ ' 1-16777214 Â

ѝ 20 Â

ʒ Â

default-metric ʒ б **redistribute** ʒ ˘ ʃ Л ʃ Â

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

ЛЮ ˘ OSPF ʃ ѝ 50 Â

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

ʒ	ʒ	

redistribute	ɟ è Â
show ip ospf	ospf Â

৶

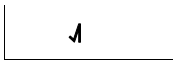
ৡ	
৶	
-	-

40.1.15 discard-route

discard ╗ ˘ no ৸ Ո discard ╗ Â

discard-route {**internal**|**external**}

no discard-route {**internal**|**external**}



40.1.18 distribute-list out

ǂ ˘ ҂ **redistribute** ҁ

distribute-list {[*access-list-number* | *name*] | **prefix** *prefix-list-name*} **out** [**bgp** | **connected** | **isis** [*area-tag*] **| ospf** *process-id* **| rip | static**]

no distribute-list {[*access-list-number* | *name*] | **prefix** *prefix-list-name*} **out** [**bgp** | **connected** | **isis** [*area-tag*] | **ospf** *process-id* | **rip | static**]

access-list-number | name	acl ‡
¸ **prefix** prefix-list-name	prefix-list ‡
bgp | connected | isis ¸ [area-tag] | **ospf** process-id | **rip** | **static**	

й ˘ Â

ҁ Â

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

Ю ǂ

```
Ruijie(config)# router ospf 1
Ruijie(config-router)# redistribute static subnets
Ruijie(config-router)# distribute-list 22 out static
Ruijie(config-router)# distribute-list prefix jjj out static
% Access-list filter exists, please de-config first
```

ҁ	
distribute-list in	LSA Â
¸ **redistribute**	ǂ è Â

Ӈ

٦	/ا	
	-	-

40.1.19 enable mib-binding

enable mib-binding ٦ MIB OSPFv2 Э Â ٦ **no** Â

enable mib-binding

no enable mib-binding

	-	-

Ю˘ MIB /ا OSPFv2 Э Â

٦ Â

OSPFv2 MIB OSPFv2 ˘ Л∪ SNMP OSPFv2 ˘ ٧ Â Ю˘ OSPFv2 MIB /ا OSPFv2 Э˘ Â

SNMP OSPFv2 ˘ ٧ Л∪ ٦ MIB Э Â

Л∪Ю ˘ SNMP /ا ѝ 100 OSPFv2 '

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

Ruijie(config-router)# **enable mib-binding**

٦		
	show ip ospf	OSPF

state-change	б state-change traps ˘ ɻ Л∪ Ю state-change traps ' **ifstatechange** ɻ ' **nbrstatechange** ɻ ' **virtifstatechange** ɻ ' **virtnbrstatechange** ɻ ' **restartstatuschange** **GR Restarter** ɻ ' **nbrrestarthelperstatuschange** **GR** ɻ ' **virtnbrrestarthelperstatuschange** **GR** ɻ

traps Â

ʒ Â

ʒ ╖ ɻ **snmp-server** ʒ ⁸˘ ″I **snmp-server enable traps ospf** ″Ą enable traps Л∪ ʌ˘ ospf trap Â

ʒ a ɻ MIB ⁸˘ a ɻ ɻ TRAP Â

ЛЬЮ ˘ OSPFv2 100 TRAP '

```
Ruijie(config)# router ospf 100
Ruijie(config-router)# enable traps
```

OSPF (graceful restart GR) ٣ graceful-restart Â
graceful-restart grace-period grace period ٣ Â ٣ no ٣ Â

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

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

grace-period	grace-period
grace-period	GR ٣ OSPF OSPF ٣ Â 1-1800

OSPF ╠(GR helper)╗ ˇ ৡ **graceful-restart helper** Â
ৡ no ╠╗ Â

graceful-restart helper {**disable** | {**strict-lsa-checking** | **internal-lsa-checking**}}

no graceful-restart helper {**disable** | {**strict-lsa-checking** | **internal-lsa-checking**}}

disable	EORÌKEOÂ

	graceful-restart	OSPF ٦

٨		
३	٨	
	-	-

40.1.23 ip ospf authentication

३ ˘ **no** ٦ Л৬ ѝ Â

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

no ip ospf authentication

	message-digest	Э Ќ * Б Ş ï

OSPF ३

/ʃ	
-	-

40.1.25 ip ospf bfd

OSPF ╟ BFD ˘ ʒ **ip ospf bfd** [**disable**] Â ʒ no Э **ip ospf bfd** Â

ip ospf bfd [**disable**]

no ip ospf bfd

disable	OSPF BFD ⁸

˘ Л∪ OSPF Ю BFD ѝ Â

Â

˝I Ю **bfd all-interfaces** ʒ Â
┘Л∪ ˘ **ip ospf bfd** ʒ BFD ˘
≠ ┘Л∪ OSPF Ю ʒ **bfd all-interfaces** б OSPF
BFD ˘ **ip ospf bfd disable** BFD
╖ Â

ʒ	
router ospf *process-id* [**vrf** *vrf-name*]	… OSPF OSPF Â
bfd all-interfaces	OSPF BFD Â

/ʃ	

-	-

40.1.26 ip ospf cost

OSPF ˆ OSPF ˜˜ ˛ **ip ospf cost** Â
˛ **no** Â

ip ospf cost *cost*

no ip ospf cost

cost	OSPF Â

ы /Bandwidthˆ ž

	-	-

40.1.27 ip ospf database-filter all out

३ a LSA

OSPF ˘ ¾ **ip ospf dead-interval** Â

¾ **no** Â

ip ospf dead-interval *seconds*

no ip ospf dead-interval

ip ospf disable all

no ip ospf disable all

-	-

ৡ Â

ৡ network area ᄀ ˇ ৡ ᄉˇ
networkˇ ≠ a Ạ ospf Â a OSPF ˇ ≠ a
б OSPF Â

```
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
```

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ৡ

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ৡ

40.1.30 ip ospf hello-interval

OSPF Hello ˇ ৡ **ip ospf hello-interval** Â
ৡ **no** Â

ip ospf hello-interval *seconds*

no ip ospf hello-interval

seconds	OSPF hello ˇ ᄆυ ᴎ Æˇ ᄂ ' 1-65535 Â

Л Ъ 10 '

PPP à HDLC 10 '

10 '

à X.25 30 Â

ʒ Â

hello hello Â ˘ OSPF ↓ ≠

˘ ╗ Â ↓ Э hello

Â ˘ hello a

Â

ЛЪЮ ˘ serial 1/0 OSPF Hello ѝ 15 Â

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

ʒ

ʒ	
ip ospf dead-interval	OSPF Â

↓

ʒ

Л	
-	-

40.1.31 ip ospf message-digest-key

OSPF MD5 ˘ ʒ ip ospf message-digest-key Â

ʒ no OSPF MD5 Â

ip ospf message-digest-key *key-id* **md5** *key*

no ip ospf message-digest-key

key	˘ ↓Л Ъ 16 Â
key-id	˘ ÿ 1 255 Â

MD5 Â

٦ Â

ip ospf message-digest-key ٦ ˘ OSPF Â a
˘ ч ﻝ a OSPF ˘ ≠ a
Â
a ﻝ ﻝ Л∪ a ˘ ﻝ Э ˘
Â ﻝ Â
OSPF ш ˘ ٦ **area authentication** Â
Э ≠ ﻝ Л∪ , Ю ٦ **ip ospf authentication**
,

40.1.32 ip ospf mtu-ignore

/ mtu ¬Л¤ ¢ Â ¢ **no** Â

ip ospf mtu-ignore

no ip ospf mtu-ignore

-	-

mtu Â

¢ Â

OSPF MTU MTU ¬, MTU MTU, ¤ a , ¬Л¤ MTU ¤ Â

ЛЫЮ ˇ serial 1/0 MTU ¶ Â

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

¢	
-	-

/

/	
-	-

40.1.33 ip ospf network

OSPF ˇ ¢ **ip ospf network** Â ¢ **no** Â

ip ospf network {*broadcast* „ *non-broadcast* „

point-to-multipoint [*non-broadcast*]„ *point-to-point*}

OSPF ३

Â ˘ a ˘ ≠ '
Â ʒ' ˘ a Â
/ l à Л Х.25 ˘ IP ˘
broadcast Â

1' ЛЬЮ ˘ ѝ ˘ Â

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

2' ЛЬЮ ˘ ѝ ˘
Â

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

3' ЛЬЮ ˘ ѝ ˘ DR/RDR˜
˚ ÂЛЬЮ ĭ a
Э ^ 8 ѝ DR/BDR˜ Â

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

ʒ	
dialer map ip	Ьѫ IP б / l / l Â
frame-relay map	Ьѫ IP б DLCI Â
neighbor˜ OSPF˜	Ьѫ IP ˘ ˩ NBMA Â

ʒ

2.6B257 0..6 53>6<18 -20.64 re 141.6 338Tc 06 213.0[(- <11115Td Tf -0.4 309.98 T25.64 20.1 re f 361

40.1.34 ip ospf priority

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

ip ospf priority *priority*

no ip ospf priority

priority	OSPF

ЊЖ LSUˆ ~ ˇ ˀ **ip ospf retransmit-interval** Â ˀ **no** Â

ip ospf retransmit-interval *seconds*

no ip ospf retransmit-interval

seconds	LSU ˇ Л∪ и Æˇ ч ' 1-65535 Â ч Â

и 5 Â

ˀ Â

LSU ˇ LSU ă ˇ **ip ospf retransmit-interval** ˀ ЊЖ ˇ ˇ LSU Â ˇ Л∪ a ˇ Эˇ ч Л∪ Â LSU area virtual-link ˀ retransmit-interval ЊЖ Â

ЛUЮ ˇ serial 1/0 LSU и 10 Â

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

ˀ	
area virtual-link	ЊЖ OSPF Â

ˀ

ˀ	
-	-

40.1.36 ip ospf transmit delay

ЊЖ OSPF LSU ˇ ˀ **ip ospf transmit delay** Â ˀ **no** Â

ip ospf transmit delay *seconds*

no ip ospf transmit delay

seconds	ЊѪ OSPF LSU ˘ ЛU ѝ Æ˘ ↓ ' 1-65535 Â

ѝ 1 Â

ֽ Â

LSU ˘ LSAs̑ ˜ Age ╗˘ ╗ ֽ ip ospf transmit delay ЊѪ Â ˘ æ ˘ Â LSU ˘ **area virtual-link** ֽ transmit-delay ЊѪ Â RGOS ˚ Age 3600 LSA˘ ˘ 9 ˘ LSA ÿ Â

ЛUЮ ˘ serial1/ 0 ѝ 5 Â

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

ग्ा ˘ a detail

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

Hello ˘ OSPF Hello ˘ Hello й
Â OSPF ˘ ٧ ″I a й 0 Hello ˘
″I й 0 a б DR/BDR Â DR/BDR ЛЬ ЛЋ DR/BDR
Hello Â
Э, й a έ Лb ╠ ,
٪ й è , Л ٧Лb cost
Â

ЛЬЮ ˘ OSPF ˘ è IP й 172.16.24.2˝ ″I
й 1˘ й 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
```

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٪	
ip ospf priority	OSPF ″I Â
ip ospf network	OSPF

Л

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Л	
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40.1.40 network area

Ѭ OSPF˝ Лb OSPF ѡ ˘ ٪ **network area** Â
٪ **no** OSPF ѡ Ѭ Â

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

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

ip-address	IP Â
wildcard	Ѭ IP Æ˘ 0 ٦ ˘ 1 a Â
area-id	OSPF ѡ Â OSPF ѡ ˘ й ˘ ≠ ٧Лb й OSPF ѡ Â

OSPF ѡ Â

҃ Â

a×

ip-address *wildcard* ч Ѭ ҃ ⅃ Л∪

OSPF ѡ Â Э OSPF ў IP network area

Ѭ IP Â network area ⅃ Ѭ •

	hard | **soft**	hard LSA OSPF soft LSA

a ⁸ external-LSA Â

⁸ external-LSA ˘ external-LSA ʌ˘ a ¨Ą Â

٪ Â

external-LSA *max-dbsize* ˘ ˘ Ю˘ a ¨Ą ╗ external-LSA˘ external-LSA Â *wait-time* ʌ˘ ˘ ╗ external-LSA Â

╗	OSPF ў ш ш
⅄	*max-dbsize* ˘ ‡ ⅄ Ю '
1˜	˘ Full '
2˜	˘ '
3˜ ⅄	AS-External-LSA '

Ю ٪ external lsa ѝ 10˜ ‡ ⅄ ѝ overflow ˘ ÿ overflow ѝ 3

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

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-	-

40.1.43 overflow memory-lack

٪ a OSPF OVERFLOW Â ٪ no ╗ Â

overflow memory-lack

no overflow memory-lack

no	a OSPF OVERFLOW ٦ Â

a Ю OSPF OVERFLOW Â

٣

OSPF OVERFLOW ў ˘ й a Ѐ Â

٦ ˘ OSPF OVERFLOW ˘ ┘ Â й ˘ OSPF NULL ˘ ÿ æ ˘ OVERFLOW Ю Â ┘ Л∪ **clear ip ospf process** ٣ Æ OSPF ˘ OSPF OVERFLOW Â

no a OSPF a OVERFLOW ˘ ┘ ˘ ˘ OSPF ˘ Â

1' OSPF a Ю a OVERFLOW '

```
Ruijie(config)# router ospf 1
Ruijie(config-router)# no overflow memory-lack
```

٣	

type *number*	ѝ ╟ Â
default	ѝ ╟ Â

ЮЎ ѝ ╟ ˘ OSPF Â

३ Â

ѝ è ╟ ⌐ ˘ ┘Л
ѝ ╟ Â

ЛЬЮ ˘ serial 1/0 ѝ ╟ Â

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

३

isis [*area-tag*]	ÿ isis ǂ ˘ *area-tag* ɛ isis
ospf *process-id*	ÿ ospf ǂ ˘ *process-id* ɛ ospf ˘ ৸ ' 1-65535
rip	ÿ rip ǂ
static	ÿ ǂ
level-1 | **level-1-2** | **level-2**	৸ ǂ IS-IS ˘ level ǂ ˘ ৸ level-2 IS-IS ǂ Â
match	৸ ǂ OSPF ˘ ǂ ˘ OSPF ǂ '

metric *metric-value*

ग ' ई OSPF ISOSPF ˘ ण ई

a OSPF Â

ʒ Â

RGOS10.1 Э ╗ /I ˘ ѝ OSPF Â a ⅄ OSPF
˘ ⅄ Л ѝ ч Â

ЛЮ ˘ **vrf** *vpn_1* … OSPF 10 Â

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

ʒ	
show ip protocols	Â
show ip ospf	ospf Â

⅄

/I	
-	-

40.1.47 router-id

ID, ʒ no ⅄ Л Router ID˘
Router ID Â

router-id *router-id*

no router-id

router-id	ID,Л IP

OSPF ˆ loopback˜ IP ѝ ’
IP ˆ loopback˜ ˘ ѫ OSPF ⅄ IP
ѝ Â

ʒ Â

⅄ Л IP ѝ ˘ /I

OSPF ३

LSA (LSA age)˘ LSA LSA
˘ CPU Â ѝ CPU ˘ LSA
Â
ѝ 4† ˘ ٦Ո ٹ Â a
Â LSA Ю˘ ˘ ٨ LSA
Â ѝ CPU ˘ LSA a ˘ Ո
LSA ˘ æ Â ˘ 10000 LSA˘ ٦Ո æ
˘ ٧ 40˙ 100 ˘ ‡ ٦Ո 10~20† Â

ՈЮ ˘ ѝ 120 Â

```
Ruijie(config)#router ospf 20
Ruijie(config-router)#timers lsa-group-pacing 120
```

ٹ

ٹ	
show ip ospf	ospf

٨

ٹ

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-	-

40.1.50 timers spf

OSPF ٦ ˘ SPF ˘ Ո ч SPF
˘ ٦ ٹ **timers spf** Â ٹ no Â

timers spf *spf-delay spf-holdtime*

no timers spf

ÂSPF Â ٨ ٨ ى˘ صم ת˜ ˘ ő

spf-holdtime

ǂ ѝ ЛЬЮ ч '

1 à RGOS 10.4 ˘ a timers throttle spf ʒ Â ѝ timers spf 5 10

2 à RGOS 10.4 ˘ timers throttle spf ʒ Â Ю timers spf ʒ a ˘ SPF Лυ **timers throttle spf** ʒ ѝ ˘ timers throttle spf

spf-delay	Hѫ SPF ˘ Л∪ ѝ Æ˘ ↓ ' 1-600000 ÂOSPF ↓ ˘ SPF spf-delay Л Â
spf-holdtime	Hѫ ч SPF ˘ Л∪ ѝ Æ˘ ↓ ' 1-600000 Â
spf-max-waittime	Hѫ ч SPF ˘ Л∪ ѝ Æ˘ ↓ ' 1-600000 Â

spf-delay' 1000 '
spf-holdtime' 5000 '
spf-max-waittime' 10000 Â

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spf-delay ÿ ↓ SPF ˘ Â SPF
γ SPF ѝ *spf-holdtime*˘ Л˘ SPF
ѝ Э ч ˘ *spf-max-waittime* Л˘
a ¨Ą ╗ Â ч SPF ˘ ѫ SPF
ÿ *spf-holdtime* Â
spf-delay *spf-holdtime* ↓Л∪ Л∪╗ ' *spf-max-waittime* ↓Л∪
Л∪ SPF ˘ ↓Л∪ ↓ Â
б **timers spf** ʒ ˘ ʒ ˘ ↓Л∪╗ SPF ˘
↓Л∪ ↓ SPF ˘ Л∪ **timers throttle spf** ʒ Â

1¨ spf-holdtime a spf-delay˘ ‡ spf-holdtime ╠ ѝ б spf-delay '
2¨ spf-max-waittime a spf-holdtime˘ ‡ spf-max-waittime ╠ ѝ б spf-holdtime Â
3¨ timers throttle spf б timers spf Â
4¨ timers spf б timers throttle spf ˘ timers throttle spf

Л∪Ю ˘ OSPF SPF à à ↑ ѝ 5 à 1000 à 90000 Â ↓ ˘ ‡ SPF ↑ ѝ'
5ms˘ 1s˘ 3s˘ 7s˘ 15s˘ 31s˘ 63s˘ 89s˘ 179s˘ 179+90 ……

```
Ruijie(config)# router ospf 20
Ruijie(config-router)# timers spf 5 1000 90000
```

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show ip ospf	ospf
timers spf	SPF Â 10.4 RGOS ˘ SPF ৡ Â timers throttle spf ৸ ৡ timers spf

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10.4(1)	ৡ

40.2

40.2.1 show ip ospf

OSPF ˘ ৡ **show ip ospf** Â

show ip ospf [*process-id*]

process-id	ospf ৷

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```
This router is an ASBR (injecting external routing information)
SPF schedule delay 5 secs, Hold time between two SPFs 10 secs
LsaGroupPacing: 240 secs
Number of incomming current DD exchange neighbors 0/5
Number of outgoing current DD exchange neighbors 0/5
Number of external LSA 4. Checksum 0x0278E0
Number of opaque AS LSA 0. Checksum 0x000000
Number of non-default external LSA 4
External LSA database is unlimited.
Number of LSA originated 6
Number of LSA received 2
Log Neighbor Adjency Changes : Enabled
Graceful-restart disabled
Graceful-restart helper support enabled
Number of areas attached to this router: 1
Area 0 (BACKBONE)
Number of interfaces in this area is 1(1)
Number of fully adjacent neighbors in this area is 1
Area has no authentication
SPF algorithm last executed 00:01:26.640 ago
SPF algorithm executed 4 times
Number of LSA 3. Checksum 0x0204bf
Area 1 (NSSA)
Number of interfaces in this area is 1(1)
Number of fully adjacent neighbors in this area is 0
Number of fully adjacent virtual neighbors through this area is 0
Area has no authentication
SPF algorithm last executed 02:09:23.040 ago
SPF algorithm executed 4 times
Number of LSA 6. Checksum 0x028638
NSSA Translator State iselected
```

OSPF б BFD ╠, Э ╕ "BFD is enabled", Ю'

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

```
Supports Graceful Restart
This router is an ASBR (injecting external routing information)
SPF schedule delay 5 secs, Hold time between two SPFs 10 secs
LsaGroupPacing: 240 secs
Number of incomming current DD exchange neighbors 0/5
Number of outgoing current DD exchange neighbors 0/5
Number of external LSA 4. Checksum 0x0278E0
Number of opaque AS LSA 0. Checksum 0x000000
Number of non-default external LSA 4
External LSA database is unlimited.
Number of LSA originated 6
Number of LSA received 2
Log Neighbor Adjency Changes : Enabled
Graceful-restart disabled
Graceful-restart helper support enabled
Number of areas attached to this router: 1
BFD is enabled
Area 0 (BACKBONE)
Number of interfaces in this area is 1(1)
Number of fully adjacent neighbors in this area is 1
Area has no authentication
SPF algorithm last executed 00:01:26.640 ago
SPF algorithm executed 4 times
Number of LSA 3. Checksum 0x0204bf
Area 1 (NSSA)
Number of interfaces in this area is 1(1)
Number of fully adjacent neighbors in this area is 0
Number of fully adjacent virtual neighbors through this area is 0
Area has no authentication
SPF algorithm last executed 02:09:23.040 ago
SPF algorithm executed 4 times
Number of LSA 6. Checksum 0x028638
NSSA Translator State iselected
```

Router ID	Â
Process uptime	OSPF ˆ router-id ѝ 0.0.0.0 a ~ Â
Bound to VRF	OSPF VRF Â

Conforms to RFC2328	б RFC2328 Â
RFC1583Compatibility flag	RFC1583 ‡ RFC2328 ‡’ ASBR ‡ Â
Support Tos	৲ TOS0 Â
Supports opaque LSA	opaque-LSA Â
Graceful-restart	RFC3623 Graceful Restart GR Restart Â
Graceful-restart helper	RFC3623 Graceful Restart GR Help Â
Router Type	OSPF normal à ABR à ASBR Â
SPF Delay	৶ SPF Â
SPF-holdtime	ч SPF Â
LsaGroupPacing	LSA ˘ ˘ Â
Incomming current DD exchange neighbors	˘ incomming exstart Â
Outgoing current DD exchange neighbors	˘ outgoing ÿ exstart Â
Number of external LSA	LSA Â
External LSA Checksum Sum	LSA Â
Number of opaque LSA	opaque-LSA Â
Opaque LSA Checksum Sum	opaque-LSA Â
Number of non-default external LSA	external-LSA Â
External LSA database limit	external-LSA ⁸ Â
Exit database overflow state interval	overflow Â
Database overflow state	OSPF overflow Â
Number of LSA originated	LSA Â
Number of LSA received	LSA Â
Log Neighbor Adjency Changes	৶ Â
Number of areas attached to this router	Э ш Â
Area type	ш , Default, Stub,NSSA Â

Number of interfaces in this area	ш Â
Number of fully adjacent neighbors in this area	ш Full Â
Number of fully adjacent virtual neighbors through this area	ш Full ' ϟ ш Â
Area authentication	ш Â
SPF algorithm last executed	Э SPF Â
SPF algorithm executed times	SPF Â
Number of LSA	ш LSA Â
Checksum Sum	ш LSA Â
NSSA Translator State	NSSA LSA й External LSA' NSSA ш˘ з ABR OSPF Â
BFD is enabled	OSPF б BFD ╟

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40.2.2 show ip ospf border-routers

ABR/ASBR OSPF ˘ ϡ **show ip ospf border-routers** Â

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

process-id	ospf ϟ

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

Л∪Ю й **show ip ospf border-routers** ʒ '

```
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	ʒ ЬЖ 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 ˘ ˩Л∪˩ ABR ASBR Â
Area 0.0.0.1	˗ ш Â
select	ASBR ˘ select Â

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40.2.3 show ip ospf database

OSPF ˘ ʒ **show ip ospf database** Â

¾ a ¿ a ¿ ˆ LSAs˜ Â

show ip ospf [*process-id area-id*] **database** [**adv-router** *ip-address* | {**asbr-summary** | **external** | **netwo Tc 0.7.|**

```
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 ҃ ЮÂ

OSPF Router with ID	OSPF б OSPF Л
Router Link States	ЛЬЮ ѝ Â
Net Link States	ЛЬЮ ѝ Â
Summary Net Link States	ЛЬЮ ѝ Â

NSSA-external Link States

Link ID	Â
ADV Router	Â
Age	Â
Seq#	/Ї˘ LSA Â
Cksum	Â
Link-Count	
Route	LSA
Tag	Â

2' ЛЬЮ ѝ **show ip ospf database asbr-summar**y ҄ '

```
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 ҄ ЮÂ

OSPF Router with ID	ЛЬЮ б OSPF /Ї
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	/Ї Â
Checksum	Â

Length	˘ Лυ ὶ Æ Â
Network Mask	Â
TOS	TOS ˘ ↙ ὶ 0 Â
Metric	Â

3' ЛЬЮ ὶ **show ip ospf database external** ʒ '

```
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 ʒ Ю Â

OSPF Router with ID	ЛЬЮ б OSPF Л Â Â
Type-5 AS External Link States	ЛЬЮ ὶ 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 ὶ Æ Â

Network Mask	Â
Metric Type	Â
TOS	TOS ˘ ˇ ˙ 0Â
Metric	Â
Forward Address	˘ IP Â ˙ 0.0.0.0˝ ‡ Â
External Route Tag	˘ 32 ÂOSPF a ˘ è ˛ OSPF Â

4' ЛЬЮ ˙ **show ip ospf database networ**k 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 ЮÂ

OSPF Router with ID	ЛЬЮ б OSPF ˩ Â
Network Link States	ЛЬЮ ˙ Â
LS age	Â
Options	Â
LS Type	Â
Link State ID	Â
Advertising Router	Â
LS Seq Number	˩ Â

Checksum	Â
Length	˘ Л υ ù æ Â
Network Mask	Â
Attached Router	Э Â

5' ЛЬЮ ù **show ip ospf database router** ʒ '

```
Ruijie# show ip ospf database router
OSPF Router with ID (1.1.1.1) (Process ID 1)
Router Link States (Area 0.0.0.0)
LS age: 322
Options: 0x2 (*|-|-|-|-|-|E|-)
Flags: 0x3 : ABR ASBR
LS Type: router-LSA
Link State ID: 1.1.1.1
Advertising Router: 1.1.1.1
LS Seq Number: 80000012
Checksum: 0x6d3a
Length: 48
Number of Links: 2
Link connected to: Stub Network
(Link ID) Network/subnet number: 100.0.1.1
(Link Data) Network Mask: 255.255.255.255
Number of TOS metrics: 0
TOS 0 Metric: 0
```

show ip ospf database router ʒ ЮÂ

OSPF Router with ID	ЛЬЮ б OSPF Л Â
Router Link States	ЛЬЮ ù Â
LS age	Â
Options	
Flag	router
LS Type	Â
Link State ID	Â
Advertising Router	Â
LS Seq Number	Л Â
Checksum	Â

Length	˘ Л∪ ѝ Æ Â
Number of Links	Â
Link connected to	˘ Л∪ Â
(Link ID)	Â
(Link Data)	Â
Number of TOS metrics	TOS ˘ ↓ TOS0 Â
TOS 0 Metrics	TOS˚ Â

6' ЛЮ ѝ **show ip ospf database summar**y ֳ '

```
Ruijie# show ip ospf database summary
OSPF Router with ID (1.1.1.1) (Process ID 1)
Summary Link States (Area 0.0.0.0)
LS age: 499
Options: 0x2 (*|-|-|-|-|-|E|-)
LS Type: summary-LSA
Link State ID: 10.0.0.0 (summary Network Number)
Advertising Router: 1.1.1.1
LS Seq Number: 80000004
Checksum: 0x330e
Length: 28
Network Mask: /24
TOS: 0  Metric: 11
```

show ip ospf database summary ֳ Ю Â

OSPF Router with ID	ЛЮ б OSPF ↑ Â
Summary Net Link States	ЛЮ ѝ Â
LS age	Â
Options	Â
LS Type	Â
Link State ID	Â
Advertising Router	Â
LS Seq Number	↑ Â
Checksum	Â Length: 28

TOS	TOS ˘ ↓ ѝ 0Â
Metric	Â

7ʹ ЛЬЮ ѝ **show ip ospf database nssa-external** ȝ '

```
Ruijie# show ip ospf database nssa-external
OSPF Router with ID (1.1.1.1) (Process ID 1)
NSSA-external Link States (Area 0.0.0.1 [NSSA])
LS age: 1
Options: 0x0 (*|-|-|-|-|-|-|-)
LS Type: AS-NSSA-LSA
Link State ID: 20.0.0.0 (External Network Number For NSSA)
Advertising Router: 1.1.1.1
LS Seq Number: 80000001
Checksum: 0x033c
Length: 36
Network Mask: /24
Metric Type: 2 (Larger than any link state path)
TOS: 0
Metric: 20
NSSA: Forward Address: 100.0.2.1
External Route Tag: 0
```

show ip ospf database nssa-external ȝ ЮÂ

OSPF Router with ID	ЛЬЮ б OSPF Л Â
NSSA-external Link States	ЛЬЮ 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	˘ Лъ ѝ æ Â
Network Mask	Â
Metric Type	Â

TOS	TOS ˘ √ и 0Â
Metric	Â
NSSA:Forward Address	˘ IP Â и 0.0.0.0ˇ ‡ Â
External Route Tag	˘ 32 ÂOSPF a ˘ ε ∫ OSPF Â

8' ЛЬЮ и **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
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 ʒ Ю Â

OSPF Router with ID	ЛЬЮ б OSPF Л Â
Type-7 AS External Link States	ЛЬЮ и 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 ѝ æ Â
Network Mask	Â
Metric Type	Â
TOS	TOS ˘ ѵ ѝ 0 Â
Metric	Â
Forward Address	˘ IP Â ѝ 0.0.0.0ʼ ‡ Â
External Route Tag	˘ 32 Â OSPF a ˘ è † OSPF Â

9ʼ ЛЬЮ ѝ **show ip ospf database database-summary** ֳ '

```
Ruijie# show ip ospf database database-summary
OSPF process 1:
Router Link States      : 4
Network Link States     : 2
Summary Link States     : 4
ASBR-Summary Link States : 0
AS External Link States  : 4
NSSA-external Link States: 2
```

show ip ospf database database-summary ֳ Ю Â

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

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40.2.4 show ip ospf interface

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

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

interface-type	ˆ ˩ ˜ Â
¸ *interface-number*	ˆ ˩ ˜ Ȑ Â

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ȝ˘ ˩Ȣ OSPF˝ Ȣ OSPF Â

ȢЮй **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 BROADCAST, Cost: 1
Transmit Delay is 1 sec, State DR, Priority 1
Designated Router (ID) 1.1.1.1, Interface Address 192.88.88.27
Backup Designated Router (ID) 3.3.3.3, Interface Address
192.88.88.72
Timer intervals configured,Hello 10,Dead 40,Wait 40,Retransmit 5
Hello due in 00:00:03
Neighbor Count is 1, Adjacent neighbor count is 1
Crypt Sequence Number is 70784
Hello received 1786 sent 1787, DD received 13 sent 8
LS-Req received 2 sent 2, LS-Upd received 29 sent 53
LS-Ack received 46 sent 23, Discarded 1
```

б BFD ˘ ¤ ╕ Ю :

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

show ip ospf interface serial *1/0* ¾ Ю Â

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	Л
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 Л
Hello received send	б HELLO Â
DD received send	б DD Â
LS-Req received send	б LS Â
LS-Upd received send	б LS Â
LS-Ack received send	б LS Â
Discard	OSPF Â

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40.2.5 show ip ospf neighbor

OSPF ˘ ३ **show ip ospf neighbor** Â

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

detail	^ ┘ ~ Â
interface-type interface-number	^ ┘ ~ Â
neighbor-id	^ ┘ ~ Â

Â

Â

ЛЫЮ й **show ip ospf neighbor**

```
Ruijie# show ip ospf neighbor
OSPF process 1, 1 Neighbors, 1 is Full:
Neighbor ID     Pri   State     Dead Time   Address     Interface
3.3.3.3   1   Full/BDR  00:00:32  192.88.88.72  FastEthernet 1/0
Ruijie# show ip ospf neighbor detail
Neighbor 3.3.3.3, interface address 192.88.88.72
In the area 0.0.0.0 via interface FastEthernet 1/0
Neighbor priority is 1, State is Full, 11 state changes
DR is 192.88.88.27, BDR is 192.88.88.72
Options is 0x52 (*|O|-|EA|-|-|E|-)
Dead timer due in 00:00:32
Neighbor is up for 05:11:27
Database Summary List 0
Link State Request List 0
Link State Retransmission List 0
Crypt Sequence Number is 0
Thread Inactivity Timer on
Thread Database Description Retransmission off
Thread Link State Request Retransmission off
Thread Link State Update Retransmission off
Thread Poll Timer on
Graceful-restart helper disabled
```

б BFD

```
DR is 192.88.88.27, BDR is 192.88.88.72
Options is 0x52 (*|O|-|EA|-|-|E|-)
Dead timer due in 00:00:32
Neighbor is up for 05:11:27
Database Summary List 0
Link State Request List 0
Link State Retransmission List 0
Crypt Sequence Number is 0
Thread Inactivity Timer on
Thread Database Description Retransmission off
Thread Link State Request Retransmission off
Thread Link State Update Retransmission off
Thread Poll Timer on
Graceful-restart helper disabled
BFD session state up
```

show ip ospf neighbor ʅ Ю'

Neighbor ID	Â
Pri	˝l ˆ DR ˜
State	
Dead Time	Dead ⅓
Address	
Interface	
interface address	
In the area	˜ ש
via interface	Â
Neighbor priority	OSPF ˝l Â
State	OSPF Â FULL ' DR й ' BDR й ' DROTHER a DR/BDR Â DR BDR Â
State changes times	˩
Dead Time	'
DR	DR (Hello DR)

BDR	BDR (Hello BDR)
Options	Hello E ˘ 0 ʁ ѝ STUB’ ˘ ʁ a STUB ʁ Â
Dead timer due in	Â
Neighbor up time	
Database Summary List	DD
Link State Request List	LS
Link State Retransmission List	
Crypt Sequence Number	ʁ MD5
Thread Inactivity Timer	
Thread Database Description Retransmission	DD

ThEead DDk .76 574..006 Td[5aB304006 Td -1.Tf16.97 0transmissList

count	OSPF

ৡ Â

ৡ OSPF ˘ count OSPF Â

```
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 ৡ Ю'

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

ৡ	
-	-

ৠ

Л	
-	-

40.2.7 show ip ospf summary-address

OSPF ˙ ˘ ৡ **show ip ospf summary-address** Â

show ip ospf [*process-id*] **summary-address**

process-id	OSPF /ˇ OSPF

ৡ Â

ৡ ৶ NSSA ABR Э ˇ з ৶ Â

ЛЬЮ й **show ip ospf summary-address** ৡ '

```
Ruijie# show ip ospf summary-address
Summary Address Summary Mask Advertise Status Aggregated subnets
---------- ---------- ---------- ---------- ----------
202.101.0.0    255.255.0.0    advertise      Inactive 0
```

Summary Address	
Summary Mask	Â
Advertise	Ὼ
Status	
Aggregated subnets	

ৡ	
-	-

৶

/ৗ	
-	-

40.2.8 show ip ospf virtual-link

OSPF ˇ ৡ **show ip ospf virtual-link** Â

show ip ospf [*process-id*] **virtual-links** *ip-address*

process-id	OSPF ∧˘ OSPF
ip-address	ID

३ Â

˘ ∧ ३ ˘ ∩∪ è Â **show ip ospf neighbor** ३ a Â

	-	-

	-	-

41 BGP

41.1

41.1.1 address-family ipv4

ৡ **address-faimly IPv4** BGP Â **exit-address-family** ৡ BGP Â

address-family ipv4 [**unicast**|**multicast**|]

no address-family ipv4 [**unicast**|**multicast**|]

unicast	⅃ ˘ IPv4
multicast	⅃ ˘ IPV4

ৡ BGP Â

BGP ˘ ⅃Ո IPv4 Â
BGP ˘ ⅃Ո ৡ **exit-address-family** Â
multicast ⅃Ո BGP ˘ IPV4
RPF Â

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# address-family ipv4
```

ৡ	
exit-address-family	

⅄

/I	
-	-

41.1.2 address-family ipv4 vrf

ৡ **address-faimly IPv4 VRF** BGP ˘ vrf
Ⅱ Â ৡ **no** ˘ б vrf Ⅱ Â
exit-address-family ৡ BGP Â

address-family ipv4 vrf *vrf-name*

no address-family ipv4 vrf *vrf-name*

vrf-name	vrf ⊿

ᕒ vrf

ৡ BGP Â

ৡ ˆ ˜ PE CE Â
BGP ˘ ⊿Ⴛ ৡ **exit-address-family** Â

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# address-family ipv4 vrf vpn1
```

ৡ	
exit-address-family	

⊿

⁄	
-	-

41.1.3 address-family ipv6

ৡ BGP **address-faimly IPv6** ˘ BGP IPv6
Ⅱ Â ৡ **no** ˘ BGP IPv6 Ⅱ Â **exit-address-family**
ৡ BGP Â

address-family ipv6 [**unicast**|**multicast**|]

no address-family ipv6 [**unicast**|**multicast**|]

unicast	¬ ˇ IPv6
multicast	¬ ˇ IPV6

¾ BGP

BGP IPv6 ˇ ¬ Л Ъ ¾ BGP IPv6 Л ˇ IPv6 ˇ ≠ ¬ Л Ъ BGP IPv6 Л ˇ IPv6 Â

multicast ¬ Л Ъ BGP ˇ IPV6 RPF Â

BGP ˇ ¬ Л Ъ ¾ **exit-address-family** Â

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# address-family ipv6
```

¾

¾	
exit-address-family	

Л

¾

Л	
-	-

41.1.4 address-family vpnv4

¾ PE VPN ˇ **address-family VPN** Â **exit-address-family** ¾ **address-family VPN** Â

address-family vpnv4 [**unicast**]

no address-family vpnv4 [**unicast**]

unicast	¬ ˇ IPv4

Ⅱ vpn

ৡ	BGP
	ৡ vpn ЮЎ PE vpn Â BGP ˘ ⅃ Л৬ ৡ **exit-address-family** Â
	`Ruijie(config)# router bgp 65000` `Ruijie(config-router)# address-family vpnv4`

ৡ		
ৡ	**exit-address-family**	

⅃		
ৡ	**-**	-

41.1.5 aggregate-address IPv4

ৡ BGP IPv4 Â ৡ **no** ╖ Â

aggregate-address *ip-address mask* {**as-set**|**summary-only**}

no aggregate-address

BGP

¼

¾	¼	
	-	-

41.1.8 bgp bestpath as-path ignore

˘ ¾ a AS Â ¾ **no**

¶ Â

bgp bestpath as-path ignore

no bgp bestpath as-path ignore

	-	-

Ю˝ AS Â

¾ BGP Â

(RFC1771) ˘ BGP a AS Â

Ю˝ AS ˘ ¨I ˘ Л∪

AS Â ┘Л∪ AS Â

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

¾		
	show ip bgp	BGP

¼

¾	¼	
	-	-

41.1.9 bgp bestpath compare-confed-aspath

˘ ৡ ৶ ASPATH ˘
ASPATH ˘ ″I Â ৡ **no** ℸ Â

bgp bestpath compare-confed-aspath

no bgp bestpath compare-confed-aspath

-	-

Ю˝ ˘ a ৶ ebgp peer ASPATH˝
è ˚ Â

ৡ BGP Â

Ю˝ EBGP peer ৶ ˘
ASPATH a ˘ ৡ ASPATH Â
ৡ ˘ ASPATH˝ a
ASPATH Â

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

ৡ	

ৡ BGP Â

AS MED ˘ ⅃ Л∪
Â

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

ৡ

ৡ	
show ip bgp	BGP Â
bgp bestpath always-compare-med	˘ a ⅃ AS MED Â
bgp bestpath med missing-as-worst	˘ MED ″I ѝ æ Â Â
bgp deterministic-med	˘ ⅃ AS ″I Â

⅄

ৡ

/I	
-	-

41.1.12 bgp bestpath med missing-as-worst

˘ ৡ MED ″I ѝ æ Â ৡ
no ℸ Â

bgp bestpath med missing-as-worst

no bgp bestpath med missing-as-worst

-	-

Ю˘ MED ˘ MED ѝ 0 Â
MED ˘ ″I ‡˘ ″I Â

ৡ BGP Â

ЮЎ MED ˘ MED й 0Ў
MED ˘ ″I ˘ Л∪ MED ″I Â
MED ″I й æЎ ٪ Â

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# bgp bestpath med missing-as-worst
```

٪	
show ip bgp	BGP Â

VPNV4 Â

BGP PE ֿ ˘ BGP VPNV4 й

a route-targe ˘ ֳ BGP й ˘ a

route-targe Â

३	

BGP

ʒ AS AS Â ʒ **no** è AS Â

bgp confederation peers as-number [*as-number*,…]

no bgp confederation peers as-number [*as-number*,…]

as-number	AS Â ' 1..65535

Â

ʒ BGP Â

IBGP Â

ǂ ѝ ˘ ID(AS Ѓ)

Â ˘ Ÿ ѝ AS˜ з ↓

AS Ѓ ↓ Â ˘ BGP speakers Ÿ

IBGP ˘ BGP speaker EBGP Â

BGP speakers EBGP ˘ ˘ Ю ѣMED

Л∪ ″I AS Ÿ a ↓ Â EBGTd21979>-6<02D392 78.358c -35.407-006 Td

no bgp default ipv4-unicast

-	-

ipv4-unicast Â

ৡ BGP Â

ৡ BGP **address family ѝ ipv4** Â

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

ৡ	
address-family ipv4	IPv4

ৠ

ৠ	
-	-

41.1.19 bgp default local-preference

ৡ local-preference Â ৡ **no** è Â

bgp default local-preference *value*

no bgp default local-preference

value	″I Â ' 0..4294967295

″I ѝ 100 Â

ৡ BGP Â

BGP Local preference ѝ ÿ IBGP peers ˝ ″I

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

ৡ	
show ip bgp	BGP Â
bgp bestpath always-compare-med	˘ a ˩ AS MED Â
bgp bestpath medconfed	˘ AS MED Â
bgp bestpath med missing-as-worst	˘ MED ″I ѝ æ Â

/I	
-	-

41.1.20 bgp deterministic-med

ৡ ˩ AS ″I MED ˘ Ю ˘ ″I Â **no** ৡ è Â

bgp deterministic med

no bgp deterministic med

-	-

Ⅱ Â

BGP Â

Ю˘ ˘ ˘ ˩ AS ″I ˘ ৡ Â

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

ৡ	ৡ	

show ip bgp	BGP Â
bgp bestpath always-compare-med	˘ a ⅃ AS MED Â
bgp bestpath med confed	˘ AS MED Â
bgp bestpath med missing-as-worst	˘ MED ″I ѝ æ Â

⅄

ৡ

⁄I	
-	-

41.1.21 bgp enforce-first-as

ৡ AS_PATH a AS ⁄I UPDATE Â
no ৡ è Â

bgp enforce-first-as

no bgp enforce-first-as

-	-

⅂I

ৡ BGP

Ю˝ UPDATE ˘ AS ⁄I Â

```
Ruijie(config-router)# bgp enforce-first-as
```

ৡ

ৡ	

¾	/I	
	-	-

41.1.22 bgp fast-external-fallover

¾ EBGP peer ˘ ¾
BGP Â ¾ **no** ╖ Â

bgp fast-external-fallover

no bgp fast-external-fallover

	-	-

╖ Â

¾ BGP Â

¾ √ EBGP Â

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

¾	¾	
	router bgp	BGP

√I

¾	/I	
	-	-

41.1.23 bgp graceful-restart

BGP ˘ ¾ bgp graceful-restart Â ¾ no
BGP Â

bgp graceful-restart

no bgp graceful-restart

-	-

BGP ˘ a ˘ ≠ a ѝ ╠ Â

٦ BGP

BGP Open à ˘ ˘
Â ٧ ˘ a ˘
GR Â

bgp graceful-restart ٦ GR ˘ Open GR ˘
GR ˘ BGP GR˘ ч GR Â
٦ a ╖ BGP ˘ BGP GR
˘ ⁸ BGP б Peer GR Â

BGP a ˘ BGP
BGP Â a б ˚
˘ ٧ S8600 IPv4 Л IPv6 a
˘ ε BGP GR Л ٧ ѝ GR Helper ╠ BGP
Â

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

٦	
router bgp	BGP
bgp graceful-restart restart-time	BGP

٧

٧	
10.4(2)	٦

41.1.24 bgp graceful-restart restart-time

BGP ˘ ٦ bgp graceful-restart restart-time Â ٦ no
ѝ Â

bgp graceful-restart restart-time *restart-time*

no bgp graceful-restart restart-time

restart-time	GR Restarter GR Helper б GR Restarter й 1 3600

й 120

BGP

GR Restarter GR Helperў GR Restarter GR Helper
б GR Restarter Â GR Helper л Ў б
GR Restarter BGP Established ˘ ‡ й BGP ˘
BGP Â
BGP Open GR ˘ a ч GR
˘ Â

```
Ruijie(config)# router bgp 500
Ruijie(config-router)# bgp graceful-restart
Ruijie(config-router)# bgp graceful-restart restart-time 150
Ruijie(config-router)# no bgp graceful-restart restart-time
```

ʒ	
bgp graceful-restart	BGP

л

л	
10.4(2)	ʒ

41.1.25 bgp graceful-restart stalepath-time

BGP ╠ ˘ ʒ bgp graceful-restart stalepath-time Â ʒ no stalepath-time й Â

bgp graceful-restart stalepath-time *time*

no bgp graceful-restart stalepath-time

-	-

ℸ Â

३ BGP M« p R Λ ʌ - Б Ŏ - ک

Ю Â

Ruijie(config-router)# **bgp nexthop trigger delay** *30*

¾	
bgp nexthop trigger enable	nexthop ¶

¼

¾	
-	-

41.1.28 bgp nexthop trigger enable

¾ Ю ¶ Â ¾ **no** Ю ¶ Â

bgp nexthop trigger enable

no bgp nexthop trigger enable

-	-

¶ Â

BGP ˘ BGP IPv4/IPv6/VPNv4 ˘ BGP IPv4 VRF Â

¾ BGP Ю ¶ Â

Ruijie(config-router)# **bgp nexthop trigger enable**

¾	
bgp nexthop trigger delay	Ю ¼ Â

¼

BGP

ip-address	IP Â

˘ a route-id Â

ৡ BGP Â

ৡ BGP

Ruijie(config-router)# **bgp scan-rib disable**

¾	
bgp scan-time	BGP

/I	
-	-

41.1.32 bgp scan-time

¾ BGP Â

bgp scan-time *time*

no bgp scan-time [*time*]

time	' ' 5..60 Æ'

60 Â

BGP ˘ BGP IPv4/IPv6/VPNv4 ˘ BGP IPv4 VRF Â

¾ BGP ˘ bgp scan-rib enable Â

Ruijie(config-router)# **bgp scan-time** *30*

¾	
bgp scan-rib enable	BGP

/I	
-	-

41.1.33 bgp update-delay

BGP Speaker ˘ **bgp update-delay** ¯ Â ¯ no **bgp update-delay** ˘

ৰ

ৡ

ৰ	
-	-

41.1.34 clear bgp all

BGP Æ Â Æ ৰ ɑ Â

clear bgp all [*as-number*|]

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

	Æ ƗO
as-number	Æ AS
peer-group	Æ
peer-group-name	ɻ
in	a ╗ **soft˘** Æ ў ╠
out	a ╗ **soft˘** Æ BGP speaker ў ╠
soft	Æ˘ Æ
soft in	Æ˘ Æ
soft out	Æ˘ ɬ Æ

ৡ Â

ৡ Æ ˘ ≠ vrf Â

ৡ

ৡ	
clear bgp ipv4 unicast	BGP IPv4 Æ

ৰ

ৡ

ৡ BGP ˘ ⁸ ⁸ Â ৡ ⅄ Ո
╟ BGP Â

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

ৡ

ৡ	
show ip bgp dampening dampened-paths	
bgp dampening	╗

⅄

ৡ

Ⅎ	
-	-

41.1.37 clear bgp ipv4 unicast external

ৡ EBGP Æ

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

in	a ╗ softˇ Æ ў ╟ Â
out	a ╗ softˇ Æ BGP speaker ў ╟ Â
soft	Æ˘ Æ Â
soft in	Æ˘ Æ Â
soft out	Æ˘ ᛏ Æ Â

Â

ৡ Â

ৡ Ո BGP Æ Â

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

३	B G 6 2 E T q

ৡ	/ſ	
	-	-

41.1.39 clear bgp ipv4 unicast peer-group

ৡ Æ Â

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

peer-group-name	ɻ Â
in	a ╗ softˇ Æ ў ╠ Â
out	a ╗ softˇ Æ BGP speaker ў ╠ Â
soft	Æˇ Æ Â
soft in	Æˇ Æ Â
soft out	Æˇ ŧ Æ Â

Â

ৡ Â

ৡ Æ BGP Â

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

ৡ	ৡ	
	clear ip bgp	Æ BGP
	show ip bgp	BGP

ſ

ৡ	/ſ	
	-	-

41.1.40 clear bgp ipv6 unicast

BGP IPv6 Æ Â

ৡ б **clear bgp ipv4 unicast** ╖ ˘ ৶ a ৶ Â

clear bgp ipv4 unicast ৡ Â	**clear bgp ipv4 unicast** ৡ Â

clear bgp ipv4 unicast ৡ Â

ৡ Â

clear bgp ipv4 unicast ৡ

ৡ	
clear bgp ipv4 unicast	BGP IPv4 Æ

৶

/\	
-	-

41.1.41 clear bgp vpnv4 unicast

BGP VPNV4 Æ Â

ৡ б **clear bgp ipv4 unicast** ╖ ˘ ৶ a ৶ Â

clear bgp ipv4 unicast ৡ	**clear bgp ipv4 unicast** ৡ

clear bgp ipv4 unicast ৡ

ৡ

clear bgp ipv4 unicast ३

BGP

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

¾	
show ip bgp dampening dampened-paths	
bgp dampening	╗

/ʃ	
-	-

41.1.44 clear ip bgp external

¾ IPv4 EBGP Æ

clear ip bgp external [[**soft**] [**in** | **out**]]

in	a ╗ soft˝ Æ ў ╟ Â
out	a ╗ soft˝ Æ BGP speaker ў ╟ Â
soft in	Æ˘ Æ Â
soft out	Æ˘ ↑ Æ Â

¾ Â

¾ Л∪ BGP Æ Â

Ruijie# **clear ip bgp external in**

¾	
clear ip bgp	Æ BGP
show ip bgp neighbors	BGP

peer-group-name	¿
in	a ╗ **soft˘** Æ ў ╠ Â
out	a ╗ **soft˘** Æ BGP speaker ў ╠ Â
soft	Æ˘ Æ Â
soft in	Æ˘ Æ Â
soft out	Æ˘ ¦ Æ Â

¾

¾ Æ BGP Â

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

¾	
clear ip bgp	Æ BGP
show ip bgp	BGP

¼

¼	
-	-

41.1.47 clear ip bgp table-map

¾ IPv4 table-map Â

clear ip bgp [**vr**f *vrf-name*] **table-map**

vrf-name	vrf ¿

¾

¾ **table-map** Â

```
Ruijie# clear ip bgp table-map
```

¾	
clear ip bgp	Æ BGP
show ip bgp	BGP

¼

¼	
-	-

41.1.48 clear ip bgp vrf

¾ Æ vrf Â

clear ip bgp vrf *vrf-name* [* | *address*] [[**soft**] [**in** | **out**]]

vrf-name	vrf ¿
*	Æ vrf Ю BGP Â
address	Æ vrf Ю б peer BGP Â
in	a ╗ **soft˘** Æ ў ╠ Â
out	a ╗ **soft˘** Æ BGP speaker ў ╠ Â
soft	Æ˘ Æ Â
soft in	Æ˘ Æ Â
soft out	Æ˘ ¦ Æ Â

Â

¾ Â

¾ Æ vrf BGP Â

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

¾	
¾ **clear ip bgp**	Æ BGP
show ip bgp	Â**Ã±**

	redistribute	‍ è

४		

३	४	
	-	-

41.1.50 default-metric

३ BGP ‍ metric Â ३ **no** ˘ ˘ Â

default-metric number

no default-metric

	number	metric ५ Ⅎ ┐

	-	-

41.1.51 distance bgp

ҳ ѝ а ⊿ BGP а ⊿ Â

BGP

Ю

٩ Â

‡ ê IP Ì Â

Ruijie(config-router)# **ip as-path access-list hsd deny** *^123$*

٩	
neighbor filter-list	Э as-path 8
neighbor distribute-list	Э ↑

٨

٨	
-	-

41.1.54 maximum-prefix

٩ 8 Ю Â ٩ no
Ю Â

maximum-prefix *maximum*

no maximum-prefix

Maximum	Ю Â <1 - 4294967295>
No	й Â

a ٨ Ю a ٨'
ipv4/ipv6 multicast Ю й 10000.
è Ю ipv4/ipv6 unicast vpnv4 unicast, ipv4 vrf й *memory-limit.*
memory-limit й (system-memory/256M)*100000 Â system-memory й
Â й 256M ‡ memory-limit й 100000 Â

ʒ

BGP ˘ BGP IPv4 ˘ BGP IPv6 ˘ BGP IPv4 VRF ˘ BGP VPNv4

BGP Ю ⅃ redistribute ˘ ≠ ⅃ ÿ ˘ a ˘ Ю BGP ˘ a Ą , table overflow ˘ Ю ≠ overflow Â

show bgp < > summary ⅃ table Â

bgp˘ **maximum-prefix** clear bgp < > * Æ Â

& overflow ˘ a maximum-prefix Â

1' ЛЬЮ ѝ ipv4 multicast ⁸ BGP Â

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

ipv4 Ю Â

٦ BGP ˘ BGP IPv4 ˘ BGP IPv6 ˘ BGP IPv4 VRF ˘ BGP VPNv4 Â

ipv4 ٦ ˘ ε ˘ ٦ Â

```
Ruijie(config)# router bgp 60
Ruijie(config-router)# neighbor 10.0.0.1 remote-as 100
Ruijie(config-router)# address-family vpnv4
Ruijie(config-router-af)# neighbor 10.0.0.1 activate
```

٦	
router bgp	BGP
neighbor remote-as	BGP Â

٨

٨	
-	-

41.1.56 neighbor advertisement-interval

٦ BGP Â ٦ **no** ٨Ո Â

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

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

peer-address	Â
peer-group-name	٨ Â ٨ a 32 Â
seconds	Â : 1..600

IBGP : 15seconds

EBGP : 30seconds

٪ BGP

BGP ˘ ж ٪ Â

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

٪	
router bgp	BGP
neighbor remote-as	BGP Â

٪

/ا	
-	-

41.1.57 neighbor allowas-in

PE ˘ ٪ PE έ PE AS /ا Â ٪ **no** ٫Ո Â

neighbor {*peer-address* | *peer-group-name*} **allowas-in number**

no neighbor {[*peer-address* | *peer-group-name*} **allowas-in**

peer-address	Â
peer-group-name	٫ Â ٫ a 32 Â
number	AS /ا ˘ ѝ Ȝ ٫ [1,10] Â

allowas-in ٣ Â

٪ BGP ˘ BGP IPv4 ˘ BGP IPv4VRF Â

ѝ spoke_hub ˘ PE Э ٪˘ PE ٫Ո Ѧ Â PE Э ч vrf ε vrf PE ˘ CE /ا vrf CE ˘ PE Â

IBGP EBGP ٫ Л Â

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

٪	
router bgp	BGP
neighbor remote-as	BGP Â

٪

٨	
-	-

41.1.58 neighbor as-override

٪ PE AS ٨ Â ٪ **no** ٫ Л Â

neighbor {*peer-address* | *peer-group-name*} **as-override**

no neighbor {*peer-address* | *peer-group-name*} **as-override**

peer-address	Â
peer-group-name	٫ Â ٫ a 32 Â

as-override ╗ Â

٪ BGP ˘ BGP IPv4 ˘ BGP IPv4VRF Â

Ю˝ BGP a é ٫ AS ٨ ˘ ٪ ٫ Л AS ٨˘ BGP ٫ Л ÿ ٫ AS ٨ Â vpn ˘ ή ч CE é ٫ AS ٨˘ ж Ю˝ ч CE ╕ ˘ PE Э Э ٪ ٨˘ ٫ Л PE CE AS ٨˘ ٨ CE ٫ Л Â

٫ EBGP ╗ Â

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

३	
router bgp	BGP

ৡ

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

ৡ

ৡ	
router bgp	BGP
neighbor remote-as	BGP Â

ৗ

ৡ

ৗ	
-	-

41.1.60 neighbor description

ৡ ঌ ( ) ৗ Â ৡ **ৎo**`È"0– D æhE“f A^ñA%6T'E6TvS Ge1T'C 4'C

router bgp	BGP
neighbor remote-as	BGP ( )Â

ʃ

ʒ	ʃ	
	-	-

41.1.61 neighbor distribute-list

ʃ BGP ˘ ACL Â ʒ **no** ʃ ACL Â

neighbor {*peer-address* | *peer-group-name*} **distribute-list** *access-list-number* {**in** | **out**}

no neighbor {*peer-address* | *peer-group-name*} **distribute-list** *access-list-number* {**in** | **out**}

peer-address	˘ ʃ IPv4 ˘ ≠ ʃ IPv6 Â
peer-group-name	ʃ Â ʃ a 32 Â
access-list-number	ACL ʃ

Ruijie(config-router)# **neighbor** *10.1.1.1*
distribute-list bgp-filter in

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

/ʃ
-

/ʃ	
peer-address	˘ ˩ IPv4 ˘ ≠ ˩ IPv6 Â Â
peer-group-name	˩ Â ˩ a 32 Â
ttl	Â ' 1..255

41.1.62 neighbor ebgp-multihop

ʒ ˩ EBGP BGP Â ʒ **no** ˬ Â

neighbor {*peer-address* | *peer-group-name*} **ebgp-multihop** [*ttl*]

no neighbor {*peer-address* | *peer-group-name*} **ebgp-multihop**

ˬ б EBGP BGP Â
ebgp-multihop ˘ a ˘ ʁ ttl 255 Â

BGP ˘ BGP IPv4 ˘ BGP IPv6 ˘ BGP IPv4 VRF Â

ˋй ˘ BGP EBGP peers Â
BGP ˘ ʁ Ȯ &

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# neighbor 10.0.0.1 remote-as 65100
Ruijie(config-router)# neighbor 10.0.0.1 ebgp-multihop
```

router bgp	BGP
neighbor remote-as	BGP Â

-	-

41.1.63 neighbor filter-list

BGP Â **no**
Â

neighbor {*peer-address* | *peer-group-name*} **filter-list** *access-list-number* {**in** | **out**}

no neighbor {*peer-address* | *peer-group-name*} **filter-list** *access-list-number* {**in** | **out**}

peer-address	IPv4 IPv6 Â
peer-group-name	Â a 32 Â
access-list-numbe	as-path list
in	as-path list Â

	ѝ Local AS Â ѝ Local AS˜ ‡ Ю ۷ ˘ ۷ Local AS б BGP ˘ ۷ AS-PATH ╗ Local AS˜ Local AS AS-PATH a 3¼WÜ àÒÅ€
٦	BGP ˘ BGP IPv4 ˘ BGP IPv6 ˘ BGP IPv4 VRF ˘ BGP VPNv4 Â

peer-group-name	٨ Â ٨ a 32 Â
maximum	Э Â
threshold	٢
warning-only	Э a BGP ˘ Â

٦ Â

٦ BGP ˘ BGP IPv4 ˘ BGP IPv6 ˘ BGP IPv4 VRF Â

Ю˘ Э ˘ BGP Â a ˘ ж ٨ Л warning-only ⁸ Â
BGP ˘ ж ٦ ˘
и ٦˘ è Â

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

٦	
router bgp	BGP
neighbor remote-as	BGP Â

٨

٨	
-	-

41.1.66 neighbor next-hop-self

BGP ٢ ˘ ٦ Ю и BGP speaker Â
٦ **no** ٨ Â

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

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

peer-address	˘ ৸ IPv4 ˘ ≠ ৸ IPv6 Â
peer-group-name	৸ Â ৸ a 32 Â

ℸ Â

BGP ˘ BGP IPv4 ˘ BGP IPv6 ˘ BGP IPv4 VRF Â

ৡ ў (Frame Relay à X.25) ˘ ˘ ৸ BGP speakers a Â BGP ˘ ⋇ ৡ Â

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

ৡ	
router bgp	BGP
neighbor remote-as	BGP Â

⁄	
-	-

41.1.67 neighbor next-hop-unchanged

ৡ ( ) a Ю Â ৡ **no** ৸ Л∪ ৸ Â

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

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

peer-address	
peer-group-name	৸ ৸ a 32

next-hop-unchanged	BGP ˆ ~ ˘ a ↓Ю

Ю˘ EBGP ↓Ю Â

ʒ

BGP ˘ BGP IPV4 ˘ BGP VPN

Neighbor next-hop-unchanged ʒ ⁸ EBGP
Ю a ↓Â ʒ a ↓ Э ˘ ↓
˘ ╖ ‡ a neighbor next-ho-self ʒ Ю Â
╖ ў VPN Â VPN OptionC Multihop MP-EBGP˜
˘ ѝ VPN PE ˘ ↓Л↻ ↓Л
↓ ˘ a ↓ ↓ Multihop MP-EBGP ˘ VPN Â
Ю EBGP Ю ѝ ˘ ѐ
PE ↓Л ↓ VPN ˘ ѝ VPN Ю ѝ ↓ ˘
VPN ↓ Â a ˘ ↓
RR ≠ Â ѝ Э ˘ ↓ ~

41.1.69 neighbor peer-group (assigning members)

ৡ BGP й BGP Â ৡ **no** BGP ÿ Â

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

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

peer-address	˘ ل IPv4 ˘ ≠ ل IPv6 Â
peer-group-name	ل Â ل a 32 Â

a Â

ৡ BGP Â

Â
ÿ ل ৡ ˘
a Â ˘
Ю ' **remote-as à update-source à local-as à reconnect-interval à times à advertisemet-interval à default-originate à next-hop-self à remove-private-as à send-community à distribute-list out à filter-list out à prefix-list out à route-map out à unsuppress-map à route-reflector-client Â**

a a ل ل peer-group ˘ ≠ a IBGP EBGP ل peer-group Â

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

ৡ	
router bgp	BGP Â
neighbor remote-as	BGP Â
neighbor peer-group (**creating**)	… BGP Â
show ip bgp peer-group	BGP Â

-	-

41.1.70 neighbor peer-group (creating)

… BGP

41.1.71 neighbor prefix-list

ل BGP ˘ ٪ Â
٪ **no** ل prefix-list Â

neighbor {*peer-address* | *peer-group-name*} **prefix-list** *prefix-list-name* {**in** | **out**}

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

peer-address	˘ ل IPv4 ˘ ≠ ل IPv6 Â
peer-group-name	ل Â ل a 32 Â
prefix-list-name	prefix-list ل Â ل a 32 Â
in	prefix list Â
out	prefix list ↑ Â

╖ Â

٪ BGP ˘ BGP IPv4 ˘ BGP IPv6 ˘ BGP IPv4 VRF ˘ BGP VPNv4 Â

‡ (in) ‡ (out)˘ ˘ ٪ **neighbor distribute-list** γ a ˘ ل ٪ Â
BGP ˘ ж ٪ ˘ ѝ neighbor prefix-list in˘ è Â
˘ ل Л∪ a ل Э a ل ˘ ⁸ Â

```
Ruijie(config)# ip prefix-list bgp-filter deny 10.0.0.1/16
Ruijie(config)# router bgp 65000
Ruijie(config-router)# neighbor 10.0.0.1 prefix-list bgp-filter in
```

٪	
router bgp	BGP
neighbor remote-as	BGP Â
ip prefix-list	… ip

ل

ৡ	/ৗ	
	-	-

41.1.72 neighbor remote-as

ৡ BGP ( )Â ৡ **no** ( )Â

neighbor {*peer-address* | *peer-group-name*} **remote-as** *as-number*

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

peer-address	˘ ˩ IPv4 ˘ ≠ ˩ IPv6 Â
peer-group-name	˩ Â ˩ a 32 Â
as-number	BGP ( ) /ৗ Â ' 1..65535

BGP Â

ৡ

BGP ˘ BGP IPv4 ˘ BGP IPv6 ˘ BGP IPv4 VRF Â

BGP ˘ ৸ ৡ Â

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

ৡ	
ৡ	

peer-address	˘ ┘ IPv4 ˘ ≠ ┘ IPv6 Â
peer-group-name	┘ Â ┘ a 32 Â
map-tag	┐ ‡ ┘ Â
in	‡ Â
out	‡

Â

¦

BGP ˘ BGP IPv4 ˘ BGP IPv6 ˘ BGP IPv4 VRF ˘ BGP VPNv4 Â

¦ ┘Л a ┘ a ┘ ‡ Â ┘Л ⁸ Â

˘ ┘Л a ┘ Э a ┘ ˘ ⁸ Â

```
Ruijie(config-router)# neighbor ip-address route-map map-tag in
```

¦	
neighbor soft-reconfiguration inbound	BGP
show ip bgp	BGP

┘

/I	
-	-

41.1.75 neighbor route-reflector-client

¦ ий ┤ ˘ è Â ¦ **no** ┘ Â

neighbor *peer-address* **route-reflector-client**

no neighbor *peer-address* **route-reflector-client**

peer-address	˘ ˩ IPv4 ˘ ≠ ˩ IPv6 Â

ℼ

ৡ BGP

ЮЎ IBGP speakers ˘ BGP speaker a ÿ IBGP peer ˉ è IBGP peersˇ Л∪ Â ˩Л∪ ৡ ˩ ˘ a Ą IBGP speakers ˘ ˩ ˉ IBGP è IBGP peers Â

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

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

ʎ

ʎ	
-	-

41.1.76 neighbor send-community

ৡ BGP Â ৡ **no** ℼ Â

neighbor {*peer-address* | *peer-group-name*} **send-community** [**both** | **standard** | **extend5g**]

no neighbor {*peer-address* | *peer-group-name*} **send-community** [**both** | **standard** | **extend5g**]

peer-address	˘ ˩ IPv4 ˘ ≠ ˩ IPv6 Â

peer-group-name	⅃ Â ⅃ a 32 Â
both	Â Â
standard	⅄ Â
extended	⅄ Â

ℸ Â

BGP ˇ BGP IPv4 ˇ BGP IPv6 ˇ BGP IPv4 VRF ˇ BGP VPNv4 Â

ꝛ ⅄ Ⅱ Â

```
Ruijie(config-router)# neighbor ip-address send-community both
```

ꝛ	
router bgp	BGP
neighbor remote-as	BGP Â
ip community-list	…

⅄

⅄	
-	-

41.1.77 neighbor send-label

ꝛ Э MPLS ˇ BGP BGP Ю ꝛˇ no ℸ Â

neighbor {*peer-address* | *peer-group-name*} **send-label**

no neighbor {*peer-address* | *peer-group-name*} **send-label**

ৡ	BGP ˘ BGP IPv4 ˘ BGP IPv6 ˘ BGP IPv4 VRF Â

ৡ ⊿ ( ) ˘ Â
ৡ Ÿ ( ) Â

S

ʒ ˘ ˩ 9 ˘ ⱷ a

ʒ˘ ˩Ո **show ip bgp neighbors** 9 Â

BGP ˘ ⱷ Ã

soo ╖ Â

ৡ BGP IPv4 Â

CE ৲ ˘ ৡ ৲ Л৬ ÿ CE PE CE Â

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

ৡ

ৡ	
router bgp	BGP
timers bgp	keepalive holdtime

৶

ৡ

⁄	
-	-

41.1.81 neighbor timers

BGP BGP ˘ ৡ BGP keepalive holdtime Â ৡ **no** Â

neighbor {*peer-address* | *peer-group-name*}**timers** *keepalive holdtime*

no neighbor {*peer-address* | *peer-group-name*} **timers** *keepalive holdtime*

peer-address	˘ ৲ IPv4 ˘ ≠ ৲ IPv6 Â
peer-group-name	৸ Â ৸ a 32 Â
keepalive	BGP KEEPALIVE message Â ' 0..65535 Â
holdtime	ѝ BGP ÿ Â ' 0..65535 Â

keepalive: 60

holdtime: 180

ʒ BGP

keepalive a holdtime Ь† Â

ѝ peer peer-group Л˘ ж peer peer˙ group

ʒ ˘ б Â

BGP ˘ ж ʒ ˘

ѝ ʒ˘ ѐ Â

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# neighborÃ&
```

ৡ BGP Â

ৡ Ὼ ⁸ Â
BGP ˘ ѫ ৡ ˘
ѝ ৡ˘ ὲ Â

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# neighbor 10.0.0.1 unsuppress-map
unspress-route
```

ৡ	
router bgp	BGP
neighbor remote-as	BGP Â
aggregate-address	
route-map	route-map

ѵ

ѵ

ѝ Â

BGP ˘ BGP IPv4 ˘ BGP IPv6 ˘ BGP IPv4 VRF Â

٦ ٦ ٦ loopback ٦ BGP BGP Â
BGP ˘ ѫ ٦ Â
˘ a TCP Â

```
Ruijie(config)# router bgp 65000
Ruijie(config-router)# neighbor 10.0.0.1 update-source lookback 1
```

٦	
router bgp	BGP
neighbor remote-as	BGP Â

٦

٨	
-	-

41.1.84 neighbor version

٦ BGP BGP ٨ Â ٦ **no** ٨ Â

neighbor {*peer-address*|*peer-group-name*} **version** *number*

no neighbor {*peer-address*|*peer-group-name*} **version** *number*

peer-address	Â
peer-group-name	٦ Â ٦ a 32 Â
number	٨

٨ 4 Â

BGP Â

٦ Л∪ Л˘ BGP ╖ Â

```
Ruijie(config-router)# neighbor 10.1.1.1 version 3
```

٦	
router bgp	BGP
neighbor remote-as	BGP Â

٨

٨	
-	-

41.1.85 neighbor weight

٦ BGP Â ٦ no ٧ Â

neighbor {*peer-address*|*peer-group-name*} **weight** *number*

no neighbor {*peer-address*|*peer-group-name*} **weight**

peer-address	Â
peer-group-name	٫ Â ٫ a 32 Â
number	Â ٧ ' 0 - 65535

˘ ÿ ٸ 0˝ ٸ 32768 Â

٦ BGP Â

٦ Л∪ Л˘ ÿ ٸ Â ˘ ″l Â route-map set weight ˘ ٦ Â

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

ৡ	
router bgp	BGP
neighbor remote-as	BGP Â

ৡ

ৡ	⁄	
	-	-

41.1.86 network(BGP)

ৡ BGP speaker Ὼ Â ৡ **no**

network synchronization	Network ৶

৶

ৡ	
⁄	
-	-

41.1.87 network synchronization

ৡ BGP speaker ৶ ⁄ Ὼ network Â ৡ
no ৶ Ⴛ Ὼ network Â

network synchronization

no network synchronization

-	-

৶ Â

ৡ BGP Â

ৡ network ˘ a ˘ ⁄ ৶
Â

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

ৡ	
router bgp	BGP
redistribute	⁑
network (**BGP**)	⁑

৶

⁄	
-	-

	/ा	
३	10.3(4b3)	३

41.1.89 redistribute

ा ३ॅ ऻ ऊ è BGP ा ॅ ३
no ऻ ऊ ॥ è Â

route-map *map-tag*			**route-map** ♩ Â			**route-map**
metric *metric-value*	Â	†		metric	Â	a
level-1	৲	†	isis level-1		Â	
level-1-2		†	isis level-1			

41.1.92 router bgp

BGP ˘ /ˇ BGP Â ৡ **no** BGP Â

router bgp *as-number*

no router bgp *as-number*

as-number	/ˇ Â ' 1..65535

BGP Â

ৡ Â

ৡ ╠ BGP Â

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

ৡ	
Ip routing	IP Â
bgp router-id	BGP Â
network	BGP speaker Ὼ Â

ৠ

/ˇ	
-	-

41.1.93 synchronization

ৡ ╠ BGP IGP ৠ ⁸ Â ৡ **no** ৠ BGP IGP ৠ ⁸ Â

synchronization

no synchronization

-	-

Ю ⅄ Â

٦ BGP Â

BGP IGP ⅄ ѝ ⅄ Â
ЛЬЮ ч Ю˘ ⅄ Л Ь ⅄ ⅄ ⁸ Л Ь '
Â ' a AS (Ю˘ AS AS)'
Â γ ' AS router BGP ˘ BGP speaker
(BGP speaker ч ч) Â

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

٦

٦	
router bgp	BGP

⅄

٦

⅄	
-	-

41.1.94 table-map

٦ ⅄ Л Ь ⁸ BGP Ю Â

table-map route-map-name

no table-map

route-map-name	route-map ⅃ Â

Ю table-map Â

٦ BGP ˘ BGP IPv4 ˘ BGP IPv4 VRF Â

Ruijie(config-router)# **timers bgp** *80 240*

¦	
neighbor timers	*keepalive holdtime* Â

/I	
-	-

41.2

41.2.1 show bgp all

¦ BGP ˘ ¦ б è BGP show ¦ Â

show bgp all [**community** | **filter-list** | **community-list** | **dampening** {**flap-statistics** | **dampened-paths**i 10.-0.0003 Tc -40.006 -1.e61 Td<061001C4>Tj/TT0 1

৲

show bgp ipv4 unicast ৲ Â

৲	
show bgp ipv4 unicast	BGP IPv4 Â

৶

৶	
-	-

41.2.2 show bgp ipv4 unicast

৲ BGP IPv4 Â

show bgp ipv4 unicast [{**network** | *network-mask*}]

show bgp ipv4 unicast community *community-number* [**exact-match**]

show bgp ipv4 unicast community-list *community-name* [**exact-match**]

show bgp ipv4 unicast dampening dampened-paths

show bgp ipv4 unicast dampening flap-statistics

show bgp ipv4 unicast filter-list *path-list-number*

show bgp ipv4 unicast inconsistent-as

show bgp ipv4 unicast prefix *ip-prefix-list-name*

show bgp ipv4 unicast quote-regexp *regexp*

show bgp ipv4 unicast regexp *regexp*

show bgp ipv4 unicast route-map *map-tag*

show bgp ipv4 unicast neighbors *neighbor-address* [**received-routes** | **routes** | **advertised-routes**]

show bgp ipv4 unicast cidr-only

show bgp ipv4 unicast label

network	Â
network-mask	Â
community *community-number*	community Â *community-number* ৸ ৶ Â ৸ AA:NN(৶/2) ≠ ৲ Ո ՈЮ ⊮ ' internet no-export local-as no-advertise
community-list *community-name*	٦ BGP Â *community-name* ৸ ৱ Â
exact -match	٦ Â
dampening dampened-paths	৪ Â
dampening flap-statistics	Â
filter-list *path-list-number*	Â*path-list-numbe* ৸ ৶ Â
inconsistent-as	AS Â
prefix *ip-prefix-list-name*	prefix-list Â
quote-regexp *regexp*	AS ٦ ৲ ৶ ‡ BGP Â
regexp *regexp*	AS ٦ ‡ BGP Â
route-map *map-tag*	route-map ˚ Â
neighbors *neighbor-address* **received-routes**	ÿ peer ˆ ৵ ˜ Â
neighbors *neighbor-address* **routes**	peer ৵ Â
neighbors *neighbor-address* **advertised-routes**	peer Â
cidr-only	Â
label	BGP ˉ MPLS Â

Â

ৡ Â

ৡ BGP IPv4 ˘ ৲ Ո
˚ Â

```
Ruijie# show bgp ipv4 unicast
BGP table version is 2, local router ID is 192.168.183.1
Status codes: s suppressed, d damped, h history, * valid, > best,
i - internal,
            S Stale
Origin codes: i - IGP, e - EGP, ? - incomplete
   Network         Next Hop           Metric     LocPrf  Path
*>i44.0.0.0        192.168.195.183         0        100     i
*>i64.12.0.0/16     192.168.195.183         0        100     i
*>i172.16.0.0/24    192.168.195.183         0        100     i
*>i202.201.0.0      192.168.195.183         0        100     i
*>i202.201.1.0      192.168.195.183         0        100     i
*>i202.201.2.0      192.168.195.183         0        100     i
*>i202.201.3.0      192.168.195.183         0        100     i
*>i202.201.18.0     192.168.195.183         0        100     i
Total number of prefixes 8
Ruijie# show bgp ipv4 unicast community 11:2222
111:12345
BGP table version is 2, local router ID is 192.168.183.1
Status codes: s suppressed, d damped, h history, * valid, > best,
i - internal,
            S Stale
Origin codes: i - IGP, e - EGP, ? - incomplete
   Network         Next Hop           Metric     LocPrf  Path
*>i202.201.0.0      192.168.195.183         0        100     i
*>i202.201.1.0      192.168.195.183         0        100     i
*>i202.201.2.0      192.168.195.183         0        100     i
*>i202.201.3.0      192.168.195.183         0        100     i
Total number of prefixes 4
Ruijie(config)# ip as-path access-list 552u3mit .*
Ruijie# show bgp ipv4 unicast filter-list 5
BGP table version is 2, local router ID is 192.168.183.1
Status codes: s suppressed, d damped, h history, * valid, > best,
i - internal,
            S Stale
Origin codes: i - IGP, e - EGP, ? - incomplete
   Network         Next Hop           Metric     LocPrf  Path
*>192.168.88.0      0.0.0.0              32768 ?
Total number of prefixes 1
```

```
Ruijie# show ip bgp cidr-only
BGP table version is 2, local router ID is 192.168.183.1
Status codes: s suppressed, d damped, h history, * valid, > best,
i - internal,
            S Stale
Origin codes: i - IGP, e - EGP, ? - incomplete
   Network         Next Hop           Metric     LocPrf  Path
*>i64.12.0.0/16    192.168.195.183         0        100     i
*>i172.16.0.0/24   192.168.195.183         0        100     i
Total number of prefixes 2
Ruijie# show bgp ipv4 unicast label
Network         Next Hop        In Label/Out Label
1.1.1.1/32      192.167.1.1      17/18
1.1.1.2/32      192.167.1.1      nolabel/19
```

Network	Â
Nexthop	Ю Â
In Label	ѝ è† ˆ ˜ Â
Out Label	ÿ Ю ˚ ˆ ˜ Â

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show ip bgp	BGP IPv4 Â

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41.2.3 show bgp ipv4 unicast dampening parameters

¾ BGP IPv4 Â

show bgp ipv4 unicast dampening parameters

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ৡ BGP IPv4 Â

```
Ruijie(config-router)#  bgp dampening 25 10000 10000 200
Ruijie# show bgp ipv4 unicast dampening parameters
dampening 25 10000 10000 200
Dampening Control Block(s):
Reachability Half-Life time    : 25 min
Reuse penalty                : 10000
Suppress penalty             : 10000
Max suppress time            : 200 min
100 654.74 04.1 40.4 re16.526.84 654.74 64.1 40.24 refBT/TT0 1 Tf10.5 0 00 0  Ts 1
```

ৡ ⊿ BGPIPv4 Â

```
Ruijie# show bgp ipv4 unicast neighbors
BGP neighbor is 192.168.195.183, remote AS 23, local AS 23, internal
link
  BGP version 4, remote router ID 44.0.0.1
  BGP state = Established, up for 00:06:37
  Last read 00:06:37, hold time is 180, keepalive interval is 60
seconds
  Neighbor capabilities:
    Route refresh: advertised and received (old and new)
    Address family IPv4 Unicast: advertised and received
    Graceful restart: advertised and received
      Remote Restart timer is 120 seconds
  Received 14 messages, 0 notifications, 0 in queue
    open message:1 update message:4 keepalive message:9
    refresh message:0 dynamic cap:0 notifications:0
  Sent 12 messages, 0 notifications, 0 in queue
    open message:1 update message:3 keepalive message:8
    refresh message:0 dynamic cap:0 notifications:0
  Route refresh request: received 0, sent 0
  Minimum time between advertisement runs is 0 seconds
 For address family: IPv4 Unicast
  BGP table version 2, neighbor version 1
```

Using BFD to detect fast fallover

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41.2.6 show bgp ipv4 unicast summary

৲ BGPIPv4 Â

show bgp ipv4 unicast summary

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৲ BGPIPv4 Â

```
Ruijie # show bgp ipv4 unicast summary
BGP router identifier 192.168.183.1, local AS number 23
BGP table version is 2
2 BGP AS-PATH entries
1 BGP community entries
Neighbor        V    AS MsgRcvd MsgSent   TblVer  InQ OutQ Up/Down
State/PfxRcd
192.168.195.79  4    24       0       0        0    0    0    never
Active
192.168.195.183 4    23      17      15        1    0    0 00:09:04
8
Total number of neighbors 2
```

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router bgp	BGP

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41.2.7 show bgp ipv6 unicast

ֽ BGP IPv6 Â

show bgp ipv6 unicast [*IPv6-Prefix*]

show bgp ipv6 unicast community *community-number* [**exact-match**]

show bgp ipv6 unicast community-list *community-name* [**exact-match**]

show bgp ipv6 unicast dampening dampened-paths

show bgp ipv6 unicast dampening flap-statistics

show bgp ipv6 unicast filter-list *path-list-number*

show bgp ipv6 unicast inconsistent-as

show bgp ipv6 unicast prefix *ipv6-prefix-list-name*

show bgp ipv6 unicast quote-regexp *regexp*

show bgp ipv6 unicast regexp *regexp*

show bgp ipv6 unicast route-map *map-tag*

show bgp ipv6 unicast neighbors *neighbor-address*

[**received-routes** | **routes** | **advertised-routes**]

network	Â
network-mask	Â
community *community-number*	community Â *community-number* ѝ /ſ Â ѝ AA:NN(/ſ /2) ≠ ⊣ ЛЬ ЛЬЮ ЊЖ ' internet no-export local-as no-advertise
community-list *community-name*	ך Â community-name ѝ ⊿ Â
exact -match	ך Â
dampening dampened-paths	8 Â
dampening flap-statistics	Â
filter-list *path-list-number*	Â path-list-numbe ѝ /ſ Â
inconsistent-as	AS Â
quote-regexp *regexp*	AS ך ⊣ /ſ ‡ BGP Â
regexp *regexp*	AS ך ‡ BGP Â

route-map *map-tag*

Â

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¦ BGP IPv6 Â

¦ ¶ б б **show bgp ipv4 unicast dampening parameters** ˘
show bgp ipv4 unicast dampening parameters ¦ Â

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show bgp ipv4 unicast dampening parameters	¦ BGP IPv4 Â

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41.2.9 show bgp ipv6 unicast neighbors

¦ BGPIPv6 Â

show bgp ipv6 unicast neighbors *neighbor-address*

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¦ ¦ ¶ б б **show bgp ipv4 unicast neighbors** *neighbor-address* ˘
show bgp ipv4 unicast neighbors *neighbor-address* ¦ Â

BGP

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41.2.11 show bgp ipv6 unicast summary

BGPIPvBw

ৡ vrf rd vpn Â

show bgp vpnv4 unicast all [*network* | **neighbor** [| *address*] | **summary** | **label**]

show bgp vpvn4 unicast vrf *vrf_name* [*network* | **summary** | **label**]

show bgp vpvn4 unicast rd *rd_value* [*network* | **summary** | **label**]

network	Â
neighbor	Â
summary	ÿ Â
label	Â
vrf_name	vrf ⅃ Â
rd_value	RD ˘ 100' 1 202.118.239.165:1

Â

ৡ Â

ৡ vrf rd vpn Â

```
Ruijie# show bgp vpnv4 unicast all
BGP table version is 0, local router ID is 192.168.183.1
Status codes: s suppressed, d damped, h history, * valid, > best,
i - internal,
            S Stale
Origin codes: i - IGP, e - EGP, ? - incomplete
Route Distinguisher: 78:90 (Default for VRF this)
   Network         Next Hop           Metric     LocPrf  Path
*> 202.210.10.0    177.36.51.3              0            10 i
*>i208.208.1.0     192.168.195.183          0        100     i
*>i208.208.2.0     192.168.195.183          0        100     i
*> 211.158.0.0     0.0.0.0                  0                i
*>i211.158.1.0     192.168.195.183          0        100     i
*> 212.210.0.0     0.0.0.0                  0                i
*> 212.210.1.0     0.0.0.0                  0                i
Total number of prefixes 7
Ruijie# show bgp vpnv4 unicast vrf this summary
BGP router identifier 192.168.183.1, local AS number 23
```

```
BGP VRF this Route Distinguisher: 78:90
BGP table version is 1
2 BGP AS-PATH entries
1 BGP community entries
Neighbor        V    AS MsgRcvd MsgSent   TblVer  InQ OutQ Up/Down
State/PfxRcd
177.36.51.2     4    10       0       0        0    0    0    never
Active
```

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show bgp ipv4 unicast	BGP IPv4 Â

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41.2.14 show ip as-path-access-list

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show ip as-path-access-list {*num*} H¢5r56C9,–6C9,–'V5eµcVX6C9•G6W aH)5qhRh""u˜ð.!G6W aD‰ŒC“&

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42 VRF

42.1 VRF

42.1.1 clear ip route vrf

VRF

clear ip route vrf *vrf-name* {* | *network* [*mask*]}

vrf-name	VRF
*	VRF

network

ip vrf *vrf-name*

no ip vrf *vrf-name*

vrf-name	… VRF ⅄

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ৡ … VRF

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

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RGOS10.1	RGOS10.1 ᒪᓄ Э

42.1.3 ip vrf forwarding

ˆ ˜ ╗ VRF; VRF˜ no

ip vrf forwarding *vrf-name*

no ip vrf forwarding *vrf-name*

vrf-name	╗ VRF ⅄

Ю˜ a VRF

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╗ VRF

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

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	RGOS10.1	RGOS10.1 Л Э

42.2.2 show ip vrf

VRF

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

	brief	ˆ ˩ ˜ VRF è
	detail	ˆ ˩ ˜ VRF è
	interfaces	ˆ ˩ ˜ VRF è
	vrf-name	ˆ ˩ ˜ VRF

˘ VRF

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ꝛ VRF ˇ ˩ Лŭ ч '

43 URPF

43.1

43.1.1 ip verify unicast source reachable-via ( )

Ю ╠ URPF Â ⅃Ⴍ ҳ **no** URPF ⅄
URPF ⅃ Â

ip verify unicast source reachable-via rx

no ip verify unicast

rx	ш URPF ˘ ш IP б ┐ Â

URPF Â

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URPF IP ˘
˘ ˘ ┐ a ˘ ‡ й Â
Ю ╠ URPF ˘ Э ╠ URPF
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1. URPF ⅄ S8600
MPLS ´ Л Â URPF Л˘ IPv4 ╠ URPF
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2. URPF ⅄ ш ˘ ┐ ˊ
˘ й Â
3. URPF a URPF
Â
4. a URPF URPF Â
5. ' S8600 Ю˘ a
URPF Â S8600 ˘ S8600
ARP ˘ URPF ˘
Â

1' ╠ URPF '

```
Ruijie(config)# ip verify unicast source reachable-via rx
```

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show ip urpf	URPF Â

ৰ S8600 MPLS ´ Â

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10.4	३

43.1.2 ip verify unicast source reachable-via ( )

Ю˘ ╠ URPF Â ৲ Л৬ ३ **no** URPF ৰ URPF ৲ Â

ip verify unicast source reachable-via {**rx** | **any**} [**allow-default** | *acl_name*]

no ip verify unicast

rx	ш URPF Âш IP б ך Â
any	URPF Â ৰ IP ৲ Â
allow-default	^ ৲ ~ URPF Â
acl_name	^ ৲ ~ ACL ৷˘ ' 1 to 99 (IP standard access list) 100 to 199 (IP extended access list) 1300 to 1999 (IP standard access list, expanded range) 2000 to 2699 (IP extended access list, expanded range)

URPF Â

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URPF IP ˘
˘ ˘ ٦ a ˘ ‡ ѝ Â
Ю ╠ URPF ˘ Э ╠ URPF Â
Ю˝ a URPF ˘ ˘ ٨ Л **allow-default**
╠ ╖ Â
Ю˝ URPF Â ACL (*acl-name*)˘
Ю ٦ ACL Â ACL a ٦ deny ACE˝ '
‡˘ ٦ permit ACE˝ Â

1. ٹ ٨˘ S8600 ٨ IPv4/IPv6
╠ URPF ˘ IPv4 ╠ URPF Â
2. ٨ S8600 B ´ Routed Port L3
AP Э URPF ˘ ٣ Ю ٨'
Â URPF a ACL Â
Â URPF a 65˙ 127 Æ IPv6 URPF
Â
Â ╠ URPF ٨˘ Э
╠ URPF ˘ URPF Â ѝ
ѝ˘ Tunnel ÿ Э Э ˘
≠ URPF ˘ ˘
╠ URPF Â
Â ╠ URPF ٨˘ Â
Â ╠ URPF ш ٨˘ URPF ٦
' ˘ ѝ Â
Â S8600 MPLS ´ ٨˘ URPF
Â
3. a URPF URPF Â

1' ÿ GigabitEthernet 0/21 URPF ш ˘ a
'

```
Ruijie(config)# interface gigabitEthernet0/21
Ruijie(config-if)# no switchport
Ruijie(config-if)# ip verify unicast source reachable-via rx
```

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show ip urpf

URPF

43.1.3 ip ver

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ip verify

no ip ve

ip verify urpf drop-rate notify	╟ URPF Â
ip verify urpf drop-rate notify hold-down	URPF R G

	10.4	३

43.1.4 ip verify urpf drop-rate notify

ip verify urpf drop-rate notify hold-down *seconds*

no ip verify urpf drop-rate notify hold-down

seconds	URPF Â Æ ѝ ˘ [30, 300] 300s Â

ѝ 300s Â

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URPF ˘ URPF
╟ URPF URPF Â

1' URPF ѝ 1† Â

```
Ruijie(config)# ip verify urpf drop-rate notify hold-down 60
```

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ip verify urpf drop-rate compute interval	URPF Â
ip verify urpf drop-rate notify	╟ URPF Â
ip verify urpf notification threshold	URPF Â

ﾉ S8600 Â

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10.4	ৡ

43.1.6 ip verify urpf notification threshold

URPF Â ﾉ ﾉ ৡ **no** URPF Â

ip verify urpf notification threshold *rate-value*

no ip verify urpf notification threshold

rate-value	URPF Â Æ ѝ pps packets per second [0, 4294967295] 1000pps Â

ѝ 1000pps Â

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urpf	URPF Trap Â

Ю˝ SNMP ў Â
˘ ‡ Â

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٦ б ٦ **snmp-server enable traps** ˘ NMS URPF
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1' SNMP ў 192.168.12.219˝ URPF Trap '

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

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snmp-server enable traps	Trap Â
ip verify urpf drop-rate compute interval	URPF Â
ip verify urpf drop-rate notify	╟ URPF Â
ip verify urpf drop-rate notify hold-down	URPF Â
ip verify urpf notification threshold	URPF Â

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1' GigabitEthernet 0/21 Э URPF Â

```
Ruijie# show ip urpf interface gigabitEthernet0/21
IP verify source reachable-via RX
IP verify URPF drop-rate notify disabled
IP verify URPF notification threshold is 1000pps
Number of drop packets in this interface is 124
Number of drop-rate notification counts in this interface is 0
```

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1' GigabitEthernet 0/21 Э URPF Â

```
Ruijie# show ip urpf interface gigabitEthernet0/21
IP verify source reachable-via RX
IP verify URPF drop-rate notify disabled
IP verify URPF notification threshold is 1000pps
Number of drop packets in this interface is 124
Number of drop-rate notification counts in this interface is 0
Ruijie# clear ip urpf interface gigabitEthernet0/21
Ruijie# show ip urpf interface gigabitEthernet0/21
IP verify source reachable-via RX
IP verify URPF drop-rate notify disabled
IP verify URPF notification threshold is 1000pps
Number of drop packets in this interface is 0
Number of drop-rate notification counts in this interface is 0
```

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show ip urpf	URPF Â

/I S8600 Â

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44

44.1

44.1.1 distribute-list in

 ⁸ ˘ Л∪ ˘ ҁ **distribute-list in** Â
ҁ **no** ⊮ Â

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

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

access-list-number	Л Л ' 1-99 1300-1999 Л ' 100-199 2000-2699
access-list-name	⅄
prefix *prefix-list-name*	
gateway *prefix-list-name*	
interface-type interface-number	(⅄) ↾ ˘ ⅄

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ѝ ˘ ⅄ Л∪ ↾ ⁸ ˘
Â ҁ OSPF ˘ ѝ OSPF a έ ˘
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˘ Â

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-router)# **exit**
Ruijie(config)# **access-list** *10* **permit** *172.16.0.0 0.0.255.255*

access-list	
prefix-list	

-	-

44.1.2 distribute-list out

distribute-list {{*access-list-number* | *access-list-name*] | **prefix** *prefix-list-name*} **out** [*interface* | *protocol* | *process-id*]

no distribute-list {{*access-list-number* | *name*] | **prefix** *prefix-list-name*} **out** [*interface* | *protocol* | *process-id*]

access-list-number	1-99 1300-1999 100-199 2000-2699
access-list-name	
prefix *prefix-list-name*	
Interface	
protocol	

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⁸ ˩ ' è ˘ ‡
ˆ ˘ è a ⁸ Â
OSPF ⁸ ˘ a ˘ ɜ ˩ OSPF
Â

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-router)# exit
Ruijie(config)# access-list 10 permit 192.168.12.0 0.0.0.255
```

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access-list	⊮ ‡
prefix-list	⊮
redistribute	ˆ

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44.1.3 ip community-list

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

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

standard	
expanded	

community-list-name	ﾉ ﾉ a 80
community-list-number	ﾉﾊ ' ﾉﾊ ﾍﾞ 1-99 ' ﾉﾊ ﾍﾞ 100-199
permit	
deny	
community-number	Â ﾍﾞ AA:NN(ﾉﾊ' 2)˘ ˘ 0-4294967295˘ ЛЪЮ Ⱨ ' internet˘ Internet ˘ Â local-as˘ a AS ˘ ˘ a è Â no-advertise˘ a BGP peers Â no-export˘ a EBGP peers Â ' 1..255 Â ' 32 Â

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ﾈ Ⱨ BGP Â

```
Ruijie(config)# ip community-list standard test deny 100:20 200:20
Ruijie(config)# ip community-list standard test2 permit internet
```

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44.1.4 ip default-network

˘ ʒ **ip default-network** Â ʒ no ˩ Л∪ Â

ip default-network *network*

no ip default-network *network*

network	ʃ Â

ѝ 0.0.0.0/0 Â

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ѝ ˘ **default-network** ЛЮ ˚ ' a ˘ ˩ Â Л∪"*" ʃ ˘ Â connected Ю ˘ ‡ Â

1' ЛЮ ˘ 192.168.100.0 ѝ ˘ ˘ Л∪ ╠ Â

```
Ruijie(config)# ip route 192.168.100.0 255.255.255.0 serial 0/1
Ruijie(config)# ip default-network 192.168.100.0
```

2' ЛЮ ˘ 200.200.200.0 ѝ ˘ ˩ 200.200.200.0 ˘ ѝ Â

```
Ruijie(config)# ip default-network 200.200.200.0
```

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show ip route	IP Â

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44.1.5 ip prefix-list

… ╗ ˘ **ip prefix-list** ϡ Â ϡ **no** Â

ip prefix-list *prefix-lis-name* [**seq** *seq-number*] { **deny** | **permit** } *ip-prefix* [**ge** *minimum-prefix-length*][**le** *maximum-prefix- length*]

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

prefix-lis-name	ɻ
seq-number	Л∪ /ﾊ Â è 1 2147483647 Â ϡ /ﾊ˘ ‡ ϧ ɬ /ﾊ Â /ﾊ 5˜ ɻ /ﾊ /ﾊ 5
deny	ϧ
permit	ϧ
ip-prefix	Л∪ Â ɻ Л∪ IP Â ÿ 0 32
minimum-prefix-length	ˆ ɻ ˜ ( ) ' **ge** ϡ
maximum-prefix-length	ˆ ɻ ˜ ( ) ' **le** ϡ

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ip prefix-list ϡ IP Â permit deny ¤ ϧ Ю ɻ ╟ Â

Ⱶ ϧ ϧ Âge le Ⱶ ϧ ˘ ip-prefix ╗ ϧ Â ϡ ge le ˘ ‡ ip-prefix ϧ Â

geˇ ‡ ך minimum-prefix-length 32 Â leˇ ‡ ך ip-prefix maximum-prefix- length

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44.1.9 ip route

˘ ʒ ip route Â ʒ no Â

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

vrf_name	VRF ʃ
network	
net-mask	
ip-address	ЮO
Interface	ˆ ˩ ˜ ЮO
distance	ˆ ˩ ˜
tag	ˆ ˩ ˜ Tag
permanent	ˆ ˩ ˜
number	ˆ ˩ ˜
disable/enable	ˆ ˩ ˜

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a ˇ Л υ è WCMP ⁸ б Л ’
⁸ ˘ ⁸ a Â
⁸ ˘ ‡ a Â
˘ ˘ ‡ Â
Л υ ˘ Ю ù ^ ip route 0.0.0.0 0.0.0.0 Fastethernet 0/0˜ Â ˘
Fastethernet 0/0 ˘ ў ARP ˘ ´ CPU Â Л υ a Л υ Â

ЛυЮ ˘ ╗ 172.16.100.0/24 ˘ Ю ù 192.168.12.1˜ ù 115 Â

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

˘ ˘ ˩ ÿ è Â ˘ ÂЛυЮ ˘ 172.16.100.0/24 ˩ ÿ fastethernet 0/0 Â

```
Ruijie(config)# ip route 172.16.100.0 255.255.255.0 fastethernet 0/0 192.168.12.1
```

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show ip route

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ʌ й ˘ ʌ й VOIP ˘ ʌЛυa RGOS ˚ IP
ℼ Â ʌЛυ RGOS IP ℼ Â

ЛυЮ ˘ RGOS ˚ IP ℼ Â
Ruijie(config)# no ip routing

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44.1.11 ip static route-limit

Э ˘ ʒ **ip static route-limit** Â ʒ no ʌЛυ Â

ip static route-limit *number*

no ip static route-limit

number	Э ˘ 1-10000

й 1024 Â

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

ЛυЮ ˘ Э й 900 ˘ ʌ Â
Ruijie(config)# **ip static route-limit** ***900***
Ruijie(config)# **no ip static route-limit**

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44.1.12 ipv6 prefix-list

… IPv6 ╗ ˇ **ipv6 prefix-list** ϡ Â ϡ **no** Â

Ipv6 prefix-list *prefix-lis-name* [**seq** *seq-number*] { **deny** | **permit** } *ipv6-prefix* [**ge** *minimum-prefix-length*

ipv6 prefix-list ϟ IPv6 Â permit deny
ā ┐ Ю ↓ ╟ Â
Ⱶ ┐ ┐ Â ge le
Ⱶ ┐ ˘ ipv6-prefix ╗ ┐ Â
ϟ ge le ˘ ‡ ipv6-prefix ┐ Â
ge˘ ‡ ┐ minimum-prefix-length 32 Â le˘ ‡ ┐
ipv6-prefix maximum-prefix- length Â γ ˘ ‡ ┐
ÿ minimum-prefix-length maximum-prefix- length Â ˘ ipv6-prefix à
minimum-prefix-length maximum-prefix-length ' ipv6-prefix <
minimum-prefix-length < maximum-prefix-length <= 128 Â

ЛЮ й ǂ ˘ RIP ǂ OSPF 1
˘ ˜ Ъ ǂ c ₾ Ы

╕

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ЛЬЮ й IPv6 pre ╕ **Deny routes from Net-A'**

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

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44.1.14 ipv6 prefix-list sequence-number

й IPv6 ╖ ˘ **ipv6 prefix-list description** ʒ Â ʒ **no** ʌ ╖ Â

ipv6 prefix-list sequence-number

-	-

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ЛЬЮ й IPv6 ╖ '

```
Ruijie# configure terminal
Ruijie(config)# ipv6 prefix-list sequence-number
```

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-	-

44.1.15 ipv6 route

ipv6 ˘ ʒ ipv6 route Â ʒ no Â

ipv6 route *network* | *prefix-length* { *ipv6-address* | *interface* [*ipv6-address*] } [*distance*] [**weight** *number*]

,Í ÕCÃ+ ÂÅ•— ß,P=C+t	
network	

ЛЬЮ ˘ ╗ 2001::/64 ˘ Ю й 2002::2
й 115 Â

```
ipv6 route 2001::/64 2002::2 115
```

˘ ˘ ┘ ÿ è
Â ˘ ÂЛЬЮ ˘ 1::/64
┘ ÿ fastethernet 0/0 Â

```
ipv6 route 2001::/64 fastethernet 0/0 2002::2
```

show ipv6 route	IPv6 Â

10.1	
10.4	weight

44.1.16 ipv6 static route-limit

Э ˘ **ipv6 static route-limit** Â no
┘Л Â

ipv6 static route-limit *number*

no ipv6 static route-limit

number	Э ˘ 1-10000

й 1000

Э й ⁸ ˘ **ipv6 static route-limit**
Э Ю ˘ a Э Â
show running config ┘Л Э Â

ЛЬЮ ˘ ipv6 Э й 900 ˘

```
Ruijie# ipv6 static route-limit 900
Ruijie# no ipv6 static route-limit
```

ipv6 route	ipv6
show ipv6 route	IPv6 Â

10.1

44.1.17 ipv6 unicast-routing

2 3C3 4 < d T 0 6 1 R2G.O2 ˇc T IP06 f T ˇ1 0 _ 2 C kO J T])Â6 (15 vm o l

	10.1	ৡ

44.1.18 match as-path

ǂ AS_PATH ˘ ৡ **match as-path** Â ৡ **no** Â

match as-path *as-path-acl-list-num as-path-acl-list-num…..*

no match as-path *as-path-acl-list-num……*

44.1.19 match community

† COMMUNITY ˘ ϡ **match community** Â ϡ **no** Â

match community{*community-list-number* | *community-list-name*}[**exact-match**] [{*community-list-number* | *community-list-name*}[**exact-match**] …]

no match community { *community-list-number* | *community-list-name* } [**exact-match**] [{ *community-list-number* | *community-list-name*} [**exact-match**] …]

community-list-number	Ⴏ ' Ⴏ ϰ 1-99 ' Ⴏ ϰ 100-199
communitys-list-name	ɻ ɻ a 80
exact-match	ϧ

Â

ϡ Â

match community ϡ ɻ ɻ Ʌ Ⴏ ɻ ˘ ч a 6 Â

exact-match ˘ a ϧ Â

‡ ˘ ɻ Ʌ 1 **match** ϡ 1 **set** ϡ Â

match ϡ˘ ‡ ϧ ' **set** ϡ˘ ‡ a Â

match origin	ϗ
set as-path prepend	ϳ AS_PATH Â
set comm-list delete	ϗ
set community	
set metric	ϳ

ϡ

ϛ		
	ϡ	
	-	-

44.1.20 match interface

ϗ Ю й ˘ ϛ **match interface** Â ϛ **no** Â

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

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

interface-type	
interface-number	ϡ

Â

ϛ Â

match interface ϛ ϡ ϡ Ո Â
ϡ Ո ÿ ϳ ϡ ╖ Â ϡ Ո OSPF
ϳ ϡ RIP ˘ ≠ ϡ Ո RIP ϳ ϡ
OSPF Â
ϳ ˘ ^ route maps˜ ˘ ч
ϳ ˚ ⁸ Â
‡ ˘ ϡ Ո 1 **match** ϛ 1 **set** ϛ Â
match ϛ˘ ‡ ϗ ’ **set** ϛ˘ ‡ a Â

ϳ ˘ ϡ Ո ϳ Э Â a
˘ è ˘ ϡ ϛ a ϡ Â ϡ ϳ

Э˘ a ⅄ ˘ è ϧ ≠ a ⅄ Â

ЛЬЮ ˘ OSPF ⍞ RIP ˘ ⅄ ⍞ Ю ѝ fastethernet 0/0 RIP Â

```
Ruijie(config)# router ospf
Ruijie(config-router)# redistribute rip subnets route-map redrip
Ruijie(config-router)# network 192.168.12.0 0.0.0.255 area 0
Ruijie(config-router)# exit
Ruijie(config)# route-map redrip permit 10
Ruijie(config-route-map)# match interface fastethernet 0/0
```

ϧ	
match ip address	ᒣ
match ip next-hop	ᒣ Ю
match ip route-source	ᒣ
match metric	ᒣ
match route-type	ᒣ

access-list-number	Ѝ Ѝ ' 1-99 1300-1999 Ѝ ' 100-199 2000-2699
access-list-name	Ѕ
prefix-list *prefix-list-name*	ѓ Ѕ

Â

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match ip address Ѕ Ѝ ЅЛ Ї Ѝ Ѕ Â
ЅЛ ÿ Ї Ѝ ╖ Â ЅЛ OSPF
Ї Ѝ RIP ˘ ≠ ЅЛ RIP Ї Ѝ
OSPF Â Ї ЅЛ IP Â
Ї ˘ ^ route maps˜ ˘ ч
Ї ˚ ⁸ Â
‡ ˘ ЅЛ IP

match ip next-hop	┐ ЮО
match ip route-source	┐
match metric	┐
match route-type	┐
match tag	┐
set metric	↑
set metric-type	↑
set tag	↑

/И	
-	-

44.1.22 match ip next-hop

↑ ЮО IP ‡ ˘ ⅋

match ip next-hop Â ⅋ **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...*]}

access-list-number	/И /И ' 1-99˝ 1300-1999 /И ' 100-199˝ 2000-2699
access-list-name	⅃

match ip next-hop ϟ ϗ ϧ ϽϽ ϻ ϗ Â

ϧ ϽϽ ÿ ϳ ϗ ϖ Â ϧ ϽϽ OSPF

ϳ ϗ ϖ Â ϧ ϽϽ OSPF ϳ

ϗ RIP ˘ ≠ ϧ ϽϽ RIP ϳ ϗ OSPF Â

ϳ ϧ ϽϽ IP Â

ϳ ˘ ο

44.1.23 match ip route-source

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

no match ip route-source {*access-list-number* [*access-list-number...* | *access-list-name...*] | *access-list-name* [*access-list-number...*| *access-list-name*] | **prefix-list** *prefix-list-name* [*prefix-list-name...*]}

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Â route map sequence ﻯ IPV6 ACL’

Â Route map sequence ﾊ ﻭ 10ʹ

Â IPv6 PBR ╖ a б prefix-list ˘ a Â

Â ﻯ Л ÿ ǂ ﾊ ╖ Â ﻯ Л

OSPF ǂ ﾊ RIP ˘ ≠ ﻯ Л RIP

ǂ ﾊ OSPF Â ǂ ﻯ Л IP

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Â ǂ ˘ ^ route maps˜ ˘ ч

ǂ ˚ ⁸ Â

Â ‡ ˘ ﻯ Л 1 match ϟ 1 set

ϟ Â match ϟ˘ ‡ ч ’ set ϟ˘ ‡ a Â

ǂ ˘ ﻯ Л ǂ Э Â a

˘ è ˘ ﻯ ϟ a ﻯ Â ﻯ ǂ

Э˘ a ﻯ ˘ è ϟ ≠ a ﻯ Â

ЛЬЮ ˘ OSPF ǂ RIP ˘ ﻯ ǂ 10

RIP ˘ OSPF ˘ ﻭ type-1˘ ﻭ 40 Â

1' ǂ

```
Ruijie(config)# ipv6 router ospf
Ruijie(config-router)# redistribute rip subnets route-map redrip
Ruijie(config-router)# exit
Ruijie(config)# ipv6 access-list v6acl
Ruijie(config-ipv6-acl)# 10 permit ipv6 2620::/64 any
Ruijie(config-ipv6-acl)# exit
Ruijie(config)# route-map redrip permit 10
Ruijie(config-route-map)# match ipv6 address v6acl
Ruijie(config-route-map)# set metric 30
```

2ʹ IPv6 PBR

IPV6 ACL

```
Ruijie(config)#ipv6 access-list aaa
Ruijie(config-ipv6-acl)#permit ipv6 2003:1000::10/80 2001:100::/64
```

ч ‡

```
Ruijie(config)#route-map user-for-pbr permit 10
Ruijie(config-route-map)#match ipv6 address aaa
```

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ϟ	
ipv6 access-list	ﻵ IPv6 ‡
match interface	ч Ю
match ipv6 next-hop	ч IPv6 Ю

[redacted]

‡ ˘ ⊿Л 1 **match** ʒ 1 **set** ʒ Â
match ʒ˘ ‡ ┐ ’ **set** ʒ˘ ‡ a Â

ǂ ˘ ⊿Л ǂ Э Â a
˘ ὲ ˘ ⊿ ʒ a ⊿ Â ⊿ ǂ
Э˘ a ⊿ ˘ ὲ ʒ ≠ a ⊿ Â
ЛЬЮ ˘ OSPF ǂ RIP ˘ ⊿ ǂ 10
RIP ˘ OSPF ˘ ѝ type-1˘ ѝ 40 Â

```
Ruijie(config)# ipv6 router ospf
Ruijie(config-router)# redistribute rip subnets route-map redrip
Ruijie(config-router)# exit
Ruijie(config)# ipv6 access-list v6acl
Ruijie(config-ipv6-acl)# 10 permit ipv6 2720::/64 any
Ruijie(config-ipv6-acl)# exit
Ruijie(config)# route-map redrip permit 10
Ruijie(config-route-map)# match ipv6 next-hop v6acl
Ruijie(config-route-map)# set metric 40
```

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ipv6 access-list	Ьѫ

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ɟ ƗO IPv6 ‡ ˘

ৡ **match ipv6 address** Â ৡ **no** Â

match ipv6 route-source { *access-list-name* | **prefix-list** *prefix-list-name* }

no match ipv6 route-source

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

Â

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

-	-

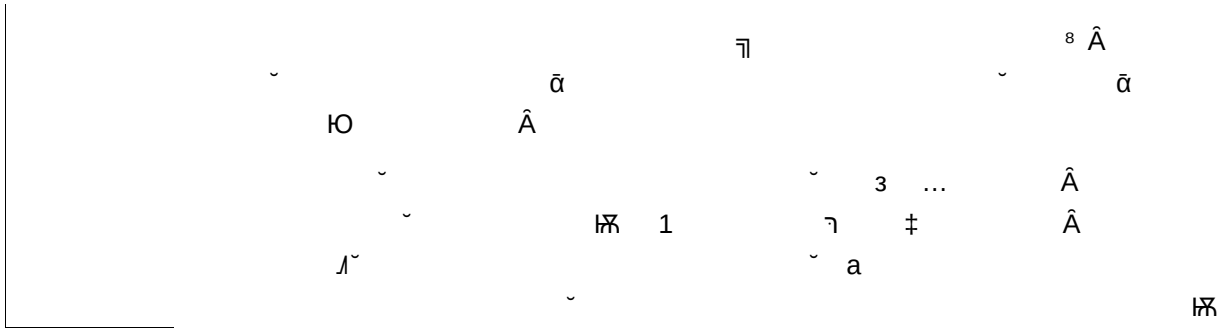
44.1.27 match length

IP **match length** **no**

match length *min-length max-length*

no match length *min-length max-length*

min-length	IP
max-length	IP



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metric

0-4294967295

-	-

44.1.29 match origin

match origin

no

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

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

set as-path prepend	AS_PATH
set metric	
set origin	

-

44.1.30 match route-type

match route-type **no**

match route-type {**local | internal | external** [**type-1 | type-2**] **| level-1 | level-2**}

no match route-type {**local | internal | external** [**type-1 | type-2**]**no match roue28c6(5(u)-7(])Tj/TT1 1 T**

```
Ruijie(config)# router rip
Ruijie(config-router)# redistribute ospf route-map redrip
Ruijie(config-router)# network 192.168.12.0
Ruijie(config-router)# exit
Ruijie(config)# route-map redrip permit 10
Ruijie(config-route-map)# match route-type internal
```

ȝ	
access-list	ᵻ ‡

match ip address

match tag ϡ ϗ ϟ ϽϽ tag Â

ϟ ϽϽ ÿ ϯ ϗ Â ϟ ϽϽ OSPF

ϯ ϗ RIP ˘ ≠ ϟ ϽϽ RIP ϯ ϗ

OSPF Â ϯ ϟ ϽϽ IP Â

ˈ ˘ ʒ **maximum-paths** Â ʒ no ˩ Л∪
ˈ Â

maximum-paths *number*

no maximum-paths

number	ˈ ˘ 1-32

ѝ 32ʼ б ɛ Л Â

ʒ Â

ˈ ѝ 8 ˈ ˘ **maximum-paths** ˈ
Л Ю ˘ Ю˘ ǂ a
ˈ Â **show running config** ˩ Л∪ ˈ Â
ʒ ipv4 ipv6 ˩ ˘ ≠ ˘ ʒ˘ ipv4
ˈ ˘ ipv6 ˈ ≠
˘ ipv6 ˈ ≠ Â
S8600 64 ˈ ˘ ˈ 32 ˈ Â S8600/
Э˘ 64 ˈ ˘ ѝ ˈ ˘
ˈ 64 ˘ ‡ ˩ Л∪ ╖ ˘ ‡ Â

ЛЮ ˘ ˈ ѝ 10 ˘ Л Â

```
Ruijie(config)# maximum-paths 10
Ruijie(config)# no maximum-paths
```

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44.1.33 route-map

Њ ˘ ˘ ʒ **route-map** Â ʒ **no**
Њ Â

route-map *route-map-name* [**permit** | **deny**] [*sequence-number*]

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

route-map-name	⊮ ⌋ Â ϯ ϧ ⌋ Â ⌋ ⎍ ⊮ ˘ /
permit	ˆ ⌋ ~ ⊮ permit ˘ match ⊮ ϩ ‡ Â‡ set ϧ ϯ ⁸ ’ ˘ set ϧ ⁸ Â Â ⊮ permit ˘ a match ⊮ ϩ ‡ Â ‡ γ Â set ϧ
deny	ˆ ⌋ ~ ⊮ deny ˘ match ⊮ ϩ ‡ Â ‡ a ˘ a ⋒

Â ˇ *sequence-number*ˇ a … ˇ
,

Â ˇ Лˇ ‡ Â

ЛьЮ ˇ OSPF ţ RIP ˇ ˇ ţ ѝ 4 RIP
ˇ OSPF ˇ ѝ type-1ˇ ѝ 40ˇ
ѝ 40 Â

```
Ruijie(config)# router ospf
Ruijie(config-router)# redistribute rip subnets route-map redrip
Ruijie(config-router)# network 192.168.12.0 0.0.0.255 area 0
Ruijie(config-router)# exit
Ruijie(config)# route-map redrip permit 10
Ruijie(config-route-map)# match metric 4
Ruijie(config-route-map)# set metric 40
Ruijie(config-route-map)# set metric-type type-1
Ruijie(config-route-map)# set tag 40
```

Redistribute	ţ

ৡ Â

ৡ BGP ˘ Â

ৡ ৸ ˆ as,ip-addr˜ ˘ a ৸

```
Ruijie(config)# route-map set-as-path
Ruijie(config-route-map)# match as-path 1
Ruijie(config-route-map)# set aggregator as 3 2.2.2.2
```

ৡ

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

৸

ৡ

৶	
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44.1.35 set as-path prepend

৲ match ‡ ৽ AS_PATH ˘ ৡ **set as-path prepend** Â ৡ **no** Â ৡ Â

set as-path prepend *as-number*

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

as-number	৽ AS_PATH AS ৶

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ꝛ ꝛ ꝛ ꝛ AS_PATH ˇ ⅃ Ⅱ as-path ꝛ 15 as Â

```
Ruijie(config)# route-map set-as-path
Ruijie(config-route-map)# match as-path 1
Ruijie(config-route-map)# set as-path prepend 100 101 102
```

ꝛ

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

⅄

ꝛ

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-	-

44.1.36 set comm-list delete

ꝛ match ‡ COMMUNITY_LIST community ˇ

ꝛ **set comm-list delete**

-	-

44.1.37 set community

match COMMUNITY **set community** **no**

set community {*community-number*[*community-number …*] **additive**

Ruijie(config-route-map)# **set community no-export**

ϡ	
match as-path	ϩ AS_PATH
match community	ϩ
match metric	ϩ
match origin	ϩ
set as-path prepend	ϯ AS_PATH
set origin	ϯ
set metric-type	ϯ

ϡ

ϡ	ϡ
-	-

44.1.38 set dampening

ϩ match ‡ ˘ ϡ **set dampening** Â ϡ **no** Â

set dampening *half-life reuse suppress max-suppress-time*

no set dampening

half-life	ϟ a ϟ Â 1..45( ) ϔ ϗ 15ϯ
reuse	æ ˘ ϐ Â 1..20000 ϗ 750 Â
suppress	˘ ϐ Â 1..20000 ϗ 2000 Â
max-suppress-time	ϐ Â 1..255( ) ϔ ϗ 4* half-life

Â

ʒ Â

ר Â

```
Ruijie(config)# route-map tag
Ruijie(config-route-map)# match as path 10
Ruijie(config-route-map)# set dampening 30 1500 10000 120
Ruijie(config-route-map)# exit
Ruijie(config)# router bgp 100
Ruijie(config-router)# neighbor 172.16.233.52 route-map tag in
```

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match as-path	ר AS_PATH
	ר
	ר
	ר
	ʅ AS_PATH
	ʅ
	ʅ ″I

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set ϟ ч ' WCMP ˘ WCMP Â
Ю˘ weight WCMP Â
set ip default next-hop ϟ Л ⅄Ц IP ˘ a 32 Â
ip address Л ╗ weight ˘ ‡ ⅄Ц a 4 nexthop Â

next-hop Л weight ˘ set ϟ
╟╔ й WCMP Â WCMP
Ю˘ weight nexthop ˘ ѐ weight
й 1 Â

set ip next-hop **set ip default next-hop** ϟ Ш ' **set ip next-hop**

Ruijie(config- route-map)#**set default interface null** *0*

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

M8600-MPLS MPLS a Â

-	-

44.1.41 set ip dscp

match DSCP **set ip dscp** Â **no** Â

set ip dscp *dscp_value*

no set ip dscp

dscp_value	IP

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

S8600 M8600-MPLS MPLS a

-	-

44.1.42 set ip next-hop

match IP **set ip next-hop**
no

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

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

ip-address	IP
weight	

set WCMP WCMP weight WCMP

set ip next-hop IP a 32
ip address weight a 4 nexthop

set ip default next-hop	Ю IP ˘
set ip precedence	IP ″I

/I	
-	-

44.1.43 set ip next-hop verify-availability

Ю IP ˘ **set ip next-hop verify-availability** **no** Â Â

set ip next-hop verify-availability *ip-address* **track** *track-obj-num*

no set ip next-hop verify-availability *ip-address* **track** *track-obj-num*

ip-address	Ю IP
track-obj-num	/I

Â

Â

```
Ruijie(config--route-map)#match ip address 20
Ruijie(config-route-map)#set ip  next-hop 172.16.100.1
Ruijie(config)#route-map load-balance permit 30
Ruijie(config-route-map)#set interface Null 0
```

ϡ

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

ϡ

ϡ	
-	-

44.1.44 set ip precedence

ϩ match ‡ IP ″I , ϡ **set ip precedence** Â ϡ **no** ˘ ″I Â

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

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

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ϡ Â

IP ″I IP a ⅄ ″I Â

‡ ˘ ⅄Л **set ip precedence** ɜ˘ ⅄ Л

˘ з ⅄ ┐ IP ″I Â

ЛЬЮ ˘ ÿ FastEthernet 0/0 ѝ 192.168.217.68

precedence ѝ 4 Â

```
Ruijie(config)#access-list 1 permit 192.168.217.68 0.0.0.0
Ruijie(config)#route-map name
Ruijie(config-route-map)#match ip address 1
Ruijie(config-route-map)#set ip precedence 4
Ruijie(config)#interface FastEthernet 0/0
Ruijie(config-if)#ip policy route-map name
```

ɜ	
match interface	┐ Ю
match ip address	┐
match ip next-hop	┐ Ю
match ip route-source	┐
match metric	┐
match route-type	┐
match tag	┐
set metric-type	ɬ
set tag	ɬ
set ip tos	IP tos

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ɜ	⅄	
	-	-

44.1.45 set ip tos

┐ match ‡ IP TOS, ɜ **set ip tos** Â

ɜ **no** ˘ tos Â

set ip tos {*<0-15>* | *max-reliability* | *max-throughput* | *min-delay* | *min-monetary-cost* | *normal* }

no set ip tos {*<0-15>* | *max-reliability* | *max-throughput* | *min-delay* | *min-monetary-cost* | *normal* }

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IP TOS IP a Ł
Â
Ł ¬ IP Э TOS Â

ЛЬЮ ˘ ÿ fastEthernet 0/0 й 192.168.217.68
tos й 4 Â

```
Ruijie(config)#access-list 1 permit 192.168.217.68 0.0.0.0
Ruijie(config)#route-map name
Ruijie(config-route-map)#match ip address 1
Ruijie(config-route-map)#set ip tos 4
Ruijie(config)#interface FastEthernet 0/0
Ruijie(config-if)#ip policy route-map name
```

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

ʎ

ϡ

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44.1.46 set ipv6 default next-hop

ϩ match ‡ IPv6 Ю IPv6 ˘ ϡ **set ipv6 default next-hop** Â ϡ no Â ϡ Â

set ipv6 default next-hop *global-ipv6-address* [*weight*] [*global-ipv6-address* [*weight*]...]

no set ipv6 default next-hop global-ipv6-address [*weight*] [*global-ipv6-address* [*weight*]...]

global-ipv6-address	Ю IPv6 Â Ю Â
weight	Ю ˘ 1˙ 8.

ϡ Â

Э Лъ ʎ˘ ϩ ‡ IPv6 ˘ a ˆ ~˘ ‡ **set ipv6 default nexthop** Ю ˘ ‡ Â match ‡ IPv6 ‡ Â б ˘ Ю ″I ˈ

Â set ipv6 next-hop’

Â ˆ ~ ’

Â set ipv6 default next-hop’

Â Â

Э˘ 64 ˘ ℸ a Â

ϡ б set ipv6 next-hop verify-availability ɹ ˘ set ipv6 next-hop verify-availability ϡ Ю ″I Â

ЛъЮ ˘ ÿ fastEthernet 0/0 ѝ 2001:0db8:2001:1760::/64 Ю ѝ 2002:0db8:2003:1::95 Â

```
Ruijie(config)# ipv6 access-list acl_for_pbr
Ruijie(config -ipv6-acl)#
```

```
Ruijie(config-route-map)#match ipv6 address acl_for_pbr
Ruijie(config-route-map)# set ipv6 default next-hop
2002:0db8:2003:1::95
Ruijie(config)#interface FastEthernet 0/0
Ruijie(config-if)#ipv6 policy route-map rm_if_0_0
```

ʔ	
match ipv6 address	ⅈ ‡
ipv6 policy route-map	Э

Ю л weight ˘ set ҙ
╟ґ й WCMP Â WCMP
Ю˘ weight nexthop ˘ ѐ weight
й 1 Â

б ˘ Ю ″I '

Â set ipv6 next-hop

Â ^ ~

Â set ipv6 default next-hop

Â

ЛъЮ ˘ ÿ fastEthernet 0/0 й
2001:0db8:2001:1760::/64 Ю й 2002:0db8:2003:1::95 Â

```
Ruijie(config)# ipv6 access-list acl_for_pbr
Ruijie(config -ipv6-acl)#permit ipv6 any 2001:0db8:2001:1760::/64
```

no set ipv6 next-hop verify-availability [*global-ipv6-address* [*weight*] **bfd** *interface-type interface-number gateway*]

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10.4	ϡ

44.1.49 set ipv6 precedence

ϩ match ‡ IPv6 ″I ˘ ϡ set ipv6 precedence Â ϡ no ˘ ″I Â

set ipv6 precedence {*<0-7>* | *critical* | *flash* | *flash-override* | *immediate* | *internet* | *network* | *priority* | *routine* }

no set ipv6 precedence {*<0-7>* | *critical* | *flash* | *flash-override* | *immediate* | *internet* | *network* | *priority* | *routine* }

Critical à flash à flash-override à immediate à internet à network à priority à routine	IPv6 ″I Â
0~7	0~7

Â

ϡ Â

Â б ѝ'

	ⅈ
0	routine
1	priority
2	network
3	internet
4	immediate
5	flash-override
6	flash
7	critical

1' IPV6 ¨I ѝ 3Â

¸ ACL6

Ruijie(config)#ipv6 access-list aaa

Ruijie(config-ipv6-acl)#permit ipv6 2003:1000::10/80 2001:100::/64

¸ route-map

Ruijie(config)#route-map pbr-aaa permit 10

Ruijie(config-route-map)#set ipv6 next-hop 2001:1234::2

¸ ¨I ╖

Ruijie(config-route-map)# set ipv6 precedence 3

Or

Ruijie(config-route-map)# set ipv6 precedence immediate

ϡ	
match ipv6 address	IPv6 PBR ┐ ACL Â

route-map

-	-

Â

Â

ЛЬЮ ˘ OSPF ↑ RIP backbone ш Â

```
Ruijie(config)# router ospf
Ruijie(config-router)# redistribute rip subnets route-map redrip
Ruijie(config-router)# network 192.168.12.0 0.0.0.255 area 0
Ruijie(config-router)# exit
Ruijie(config)# route-map redrip permit 10
Ruijie(config-route-map)# set level backbone
```

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

set local-preference *number*

no set local-preference

number	″I Â ' 0-4294967295

Â

Â

ﻝ local-preference ˇ a local-preference Â
ʒ ך ″I Â

```
Ruijie(config)# route-map SET_PREF permit 10
Ruijie(config-route-map)# match as-path 1
Ruijie(config-route-map)# set local-preference 6800
Ruijie(config-route-map)# exit
Ruijie(config)# route-map SET_PREF permit 20
Ruijie(config-route-map)# match as-path 2
Ruijie(config-route-map)# set local-preference 50
```

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

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-	-

44.1.52 set metric

ϗ match ‡ ˘ ϗ **set metric** Â ϗ **no** Â

set metric [+ *metric-value* | **-** *metric-value* | *metric-value*]

no set metric

+	╗ˆ metric Э ╗˜
-	ˆ metric Э ˜
metric-value	ϯ

a ⅄ ϯ a Â

ϗ Â

˘ ˘ Â ὲ set metric à Ʌ ļ + Ľ ļ - Ľ metric ЭЮ Â RIP ϯ ὲ ˘ metric ⅄ ὺ 1-16 Â ⅄ Ʌ ÿ ϯ ⅄ ╗ Â ⅄ Ʌ OSPF ϯ ⅄ RIP ˘ ≠ ⅄ Ʌ RIP ϯ ⅄ OSPF Â ϯ ⅄ Ʌ IP Â ϯ ˘ ˆ route maps˜ ˘ ч ϯ ˅ ⁸ Â ‡ ˘ ⅄ Ʌ 1 **match** ϗ 1 **set** ϗ Â **match** ϗ˘ ‡ ϖ ’ **set** ϗ˘ ‡ a Â

ɅЮ ˘ OSPF ϯ RIP ˘ ϯ ὺ 40 Â

```
Ruijie(config)# router ospf
Ruijie(config-router)# redistribute rip subnets route-map redrip
Ruijie(config-router)# network 192.168.12.0 0.0.0.255 area 0
Ruijie(config-router)# exit
Ruijie(config)# route-map redrip permit 10
Ruijie(config-route-map)# set metric 40
```

ϗ

ϗ	
match interface	ϖ Ю
match ip address	ϖ
match ip next-hop	ϖ Ю

match ip route-source	┐
match metric	┐
match route-type	┐
match tag	┐
set metric-type	┼
set tag	┼

╛	
-	-

44.1.53 set metric-type

┐ match ‡ ˘ ╕ **set metric-type** Â
╕ **no** Â

set metric-type *type*

no set metric-type

type	┼

OSPF ┼ ╣ type-2 Â

Â

┘ Л ÿ ┼ ╛ ╖ Â ┘ Л OSPF
CÃ ┼ ╛ e mapsTc 2.964

Ruijie(config-router)# **network** *192.168.12.0 0.0.0.255* **area** *0*
Ruijie(config-router)# **exit**
Ruijie(config)# **route-map** *redrip* **permit** *10*
Ruijie(config-route-map)# **set metric-type type-1**

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

-	-

44.1.54 set next-hop

match IP **set next-hop** **no** Â Â

set next-hop *ip-address*

no set next-hop *ip-address*

ip-address	IP

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ʃ Л RIP ˘ ≠ ⅃ Л∪ RIP ʃ Л
OSPF Â ʃ ⅃ Л∪ IP Â
ʃ ˘ ^ route maps˜ ˘ ч
ʃ ˚ ⁸ Â
‡ ˘ ⅃ Л∪ 1 **match** ʒ 1 **set** ʒ Â
match ʒ˘ ‡ ¬ ’ **set** ʒ˘ ‡ a Â

ЛυЮ ˘ ¬ ⁸ ˝ Ю ѝ 192.168.1.2 Â

```
Ruijie(config)# route-map redrip permit 10
Ruijie(config-route-map)# match ip address 1
Ruijie(config-route-map)# set next-hop 192.168.1.2
```

ʒ

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-type	ʃ
set tag	ʃ

Л

Л

egp	EGP
igp	IGP
incomplete	a

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Â

```
Ruijie(config)# route-map SET_ORIGIN 10 permit
Ruijie(config-route-map)# match as-path 1
Ruijie(config-route-map)# set origin igp
Ruijie(config-route-map)# exit
Ruijie(config)# route-map SET_ORIGIN 20 permit
Ruijie(config-route-map)# match as-path 2
Ruijie(config-route-map)# set origin egp
```

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

-	-

44.1.56 set originator-id

match **set originator-id** Â

no Â

set originator-id *ip-addr*

no originator-id [*ip-addr*]

ip-addr	

Â

ϡ Â

ϡ ┐ Â

```
Ruijie(config)# route-map SET_ORIGIN 10 permit
Ruijie(config-route-map)# match as-path 1
Ruijie(config-route-map)# set originator-id 5.5.5.5
Ruijie(config-route-map)# exit
Ruijie(config)# route-map SET_ORIGIN 20 permit
Ruijie(config-route-map)# match as-path 2
Ruijie(config-route-map)# set originator-id 5.5.5.6
```

ϡ	
match as-path	┐ AS_PATH
match metric	┐
match origin	┐
set as-path prepend	┼ AS_PATH
set metric	┼
set local-preference	┼ ¨I

ϡ

/I	
-	-

44.1.57 set tag

┐ match ‡ ˘ ϡ **set tag** Â ϡ **no** Â

set tag *tag*

no set tag

tag	†

a ↵ Â

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ʒ ↵ † Â ʒ˘ Â

ЛЬЮ ˘ OSPF † RIP ˘ † й 100 Â

```
Ruijie(config)# router ospf
Ruijie(config-router)# redistribute rip subnets route-map redrip
Ruijie(config-router)# network 192.168.12.0 0.0.0.255 area 0
Ruijie(config-router)# exit
Ruijie(config)# route-map redrip permit 10
Ruijie(config-route-map)# set tag 100
```

ʒ

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	†
set metric-type	†

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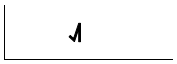

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44.2.2 show ip prefix-list

˘ **show ip prefix-list** ʒ Â

show ip prefix-list [*prefix-name*]

prefix-name	ɻ

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ɻ ˘ ˘ ‡ ʃ

Â

```
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
```

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44.2.3 show ip route

IP ˘ **show ip route** ʒ Â

show ip route [[**vrf** *vrf_name*] [*network* [*mask*] | **count** | **protocol** [*process-id*] | **weight**]]

vrf *vrf_name*	^ ⅃ ~ ⅂ VRF
network	^ ⅃ ~ ⅂
mask	^ ⅃ ~ ⅂
count	^ ⅃ ~
protocol	^ ⅃ ~ ' **connected**, **static**' ˇ ⅠO ' **bgp**, **isis**, **ospf**, **rip** @ðŁÄ !56dp5•r,@ßÑ~ðB×

O	Â ˩ ˩ ˥' C' ' S' ' R' RIP ' B' BGP ' O' OSPF ' i' IS-IS Â
E2	Â ˩ ˩ ˥' E1' OSPF ˝ ' E2' OSPF ˇ ' N1' OSPF NSSA 1' N2' OSPF NSSA 2' IA' OSPF ' su' IS-IS ' L1' IS-IS 1 ' L2' IS-IS 2 ' ia' IS-IS Â
20.0.0.0/8	
[1/0]	˛
Via 20.0.0.1	Ю IP
00:00:06	
VLAN 1	Ю

2' ЛЬЮ ѝ **show ip route** *network* ҁ '

```
Ruijie# show ip route 30.0.0.0
Routing entry for 30.0.0.0/8
Distance 110, metric 20
Routing Descriptor Blocks:
*192.1.1.1, 00:01:11 ago, via VLAN 1, generated by OSPF, extern 2
```

Routing Descriptor Blocks	Ю IP à à à à à àBGP

3' ЛЬЮ ѝ **show ip route count** ҁ '

```
Ruijie# show ip route count
--------- route info ----------
the num of active route: 5
```

4' ЛЬЮ ѝ **show ip route weight** ҁ '

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

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44.2.4 show ipv6 prefix-list

IPv6 ˘ **show ipv6 prefix-list** ʒ Â

show ipv6 prefix-list [*prefix-name*]

prefix-name	IPv6 ɻ

IPv6 Â

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ɻ ˘ ˘ ‡ ʃ
Â

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

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-	-

-	-

44.2.5 show ipv6 route

IPv6 **show ipv6 route**

show ipv6 route [[*network/prefix-length* | **summary** | **protocol**]]

network/prefix-length	
summary	ipv6
protocol	**connected**, **static** **bgp**, **isis**, **ospf**, **rip**

show ipv6 route

```
Ruijie(config)# show ipv6 route
IPv6 routing table name is Default(0) global scope - 7 entries
```

O	Â ⅃ ⅄ ѝ' C' ' L' ў ' S' ' R' RIP ' B' BGP ' O' OSPF ' ї' IS-IS Â
E2	Â Ӿ ⅃ ⅄ ѝ' E1' OSPF ˝ ' E2' OSPF ˇ ' N1' OSPF NSSA 1' N2' OSPF NSSA 2' IA' OSPF ' su' IS-IS L1' IS-IS 1 ' L2' IS-IS 2 ' ia' IS-IS Â
20::/64	
[1/0]	˛
Via 10::4	Ю IP
00:00:06	
VLAN 1	Ю

ipv6 route	**ipv6**

Э a

10.1	

44.2.6 show route-map

show route-map Â

show route-map *route-map-name*

Ruijie(config-route-map)#**exit**

Ruijie(config)#**ip local policy route-map** *lab1*

access-list	
route-map	
set vrf	IP VRF
set ip next-hop	IO
set ip default next-hop	IO
set interface	
set default interface	
set ip tos	IP TOS
set ip dscp	IP DSCP
set ip precedence	IP
match ip address	
match length	

-	-

45.1.2 ip policy

set ip [**default**] **nexthop** IO

IO **ip policy** **no**

ip policy {**load-balance | redundance**}

no ip policy

load-balance | redundance	

ʒ Â

set ip next-hop ˘ ˩ Л Ю ˘ ˘

˩ ˩ Л Ю Ю ' ˘

Ю ˘ WCMP ˩ Л Ю 8 Ю ˘ ECMP ˩ Л Ю 32 Ю

Â Ю Ю ˝ ARP з ARP MAC

MAC ≠ Â

Л Ю Ю ˘ nexthop, Ю Л ˘

‡ **FastEthernet** 0/0 Э ˩ nexthop Â

1' ˥ IP ACL

```
Ruijie(config)#access-list 1 permit 10.0.0.1
Ruijie(config)#access-list 2 permit 20.0.0.1
```

2' Ю.>6<053 ˘ ў ›ø 0 0 ş

1 permit (10.0.0.1 Tf1 0 0 1 98.504 Tm[(permit 10.0.0.1)]TJ 0 -1.2 Td[(route-map cisco)]TJ 0 -1.2 Td( )Tj/la

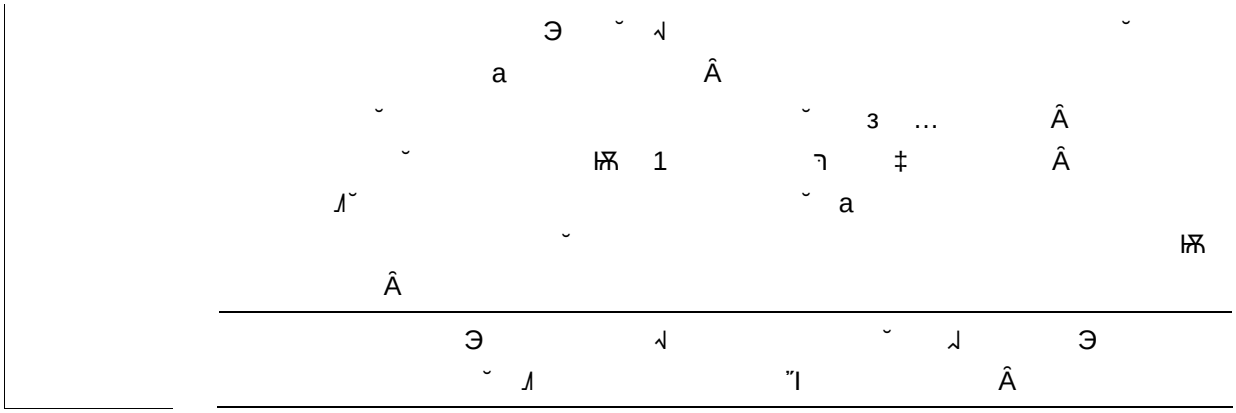
-	-

45.1.3 ip policy route-map

ip policy route-map *route-map*

no ip policy route-map

route-map	



FastEthernet 0/0

10.0.0.1 196.168.4.6 20.0.0.1 196.168.5.6

1 IP ACL

```
Ruijie(config)#access-list 1 permit 10.0.0.1
Ruijie(config)#access-list 2 permit 20.0.0.1
```

2

```
Ruijie(config)#route-map lab1 permit 10
Ruijie (config-route-map)#match ip address 1
Ruijie(config-route-map)#set ip next-hop 196.168.4.6
Ruijie(config-route-map)#exit
Ruijie(config)#route-map lab1 permit 20
```

```
Ruijie(config-route-map)#match ip address 2
Ruijie(config-route-map)#set ip next-hop 196.168.5.6
Ruijie(config-route-map)#exit
  3'       Э
Ruijie(config)#interface FastEthernet 0/0
Ruijie(config-if)#ip policy route-map lab1
Ruijie(config-if)#exit
```

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ʕ	
access-list	Ħ ‡ Â
route-map	Ħ Â
set vrf	Ħ IP VRF
set ip next-hop	Ħ Ю
set ip default next-hop	Ħ Ю
set interface	Ħ
set default interface	Ħ
set ip tos	IP TOS
set ip dscp	IP DSCP
set ip precedence	IP ˝I
match ip address	‡
match length	˥

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45.1.4 ipv6 local policy route-map

ʎ ˘ ʕ Â ʎ Л ʕ no

⁸ ╖ Â

ipv6 local policy route-map *route-map-name*

no ipv6 local policy route-map

route-map-name	**route-map**
no	

IPv6 ping

IPv6

1

1

set ipv6 precedence	IPv6 ˝I Â
show ipv6 policy	Â
show route-map	Â

set default interface	Ю Â
set interface	Ю Â
set ipv6 default next-hop	Ю Â
set ipv6 next-hop	Ю Â
show ipv6 policy	Â

-

10.4	

45.1.6 ipv6 policy route-map

ipv6 policy route-map Â no

Â

ipv6 policy route-map *route-map-name*

no ipv6 policy route-map

route-map-name	**route-map** Â

Ю Â

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Â Э a Â

Â … Â

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Э Â	

1' Â GigabitEthernet 1/38 Э

ÿ 2003:1000::10/80 2001:100::/64 AAA IPV6 ACL

2003:1001::2 Â

¸ IPV6 ACL

Ruijie(config)#**ipv6 access-list** aaa

Ruijie(config-ipv6-acl)#**permit ipv6** 2003:1000::10/80 2001:100::/64

¸ route-map

Ruijie(config)#**route-map** pbr-aaa **permit** 10

Ruijie(config-route-map)#**match ipv6 address** aaa

Ruijie(config-route-map)#**set ipv6 next-hop** 2003:1001::2

¸ Э

Ruijie(config-if-GigabitEthernet 1/38)#**ipv6 policy route-map** pbr-aaa

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ϡ	
match ipv6 address	IPv6 PBR ϧ IPV6 ACL Â
route-map	Â
set ipv6 default next-hop	Ю Â
set ipv6 next-hop	Ю Â
show ipv6 policy	Â
show route-map	Â

Ѝ Â

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Ѝ	
10.4	ϡ

45.2

45.2.1 show ip policy

Э Ѓ Â

show ip policy

-	-

ʒ

```
Ruijie#show ip policy
```


45.2.2 show ipv6 policy

IPv6 ˘ ˩ Л ʊ show ipv6 policy ʒ Â

show ipv6 policy [*route-map-name*]

route-map-name	˩

Â

Banlance Mode redundance

Interface Route map

VLAN 1 RM_for_Vlan_1

VLAN 2 RM_for_Vlan_2

Banlance Mode	Â
Interface	Â
Route map	Â

show route-map	Â

Â

10.4	

46 IGMP

46.1

46.1.1 ip igmp access-group

ȝ Э ⁸ Â ȝ no ˩ Л ˩ ℸ Â

ip igmp access-group *access-list*

no ip igmp access-group

access-list	⁸ ˩ ˘ <1-199>|<1300-2699> | WORD

```
Ruijie(config-ext-nacl)# permit ip host 1.1.1.1 host 233.3.3.3
Ruijie(config)# interface ethernet 0
Ruijie(config-if)# ip igmp access-group ext_acl
```

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/ı	
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46.1.2 ip igmp join-group

३ ╗ ˘ ३ ╗ no ↓ Â

ip igmp join-group *group-address*

no ip igmp join-group *group-address*

group-address	Э ╗ ў

╗ ў Â

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	-	-

46.1.3 ip igmp immediate-leave group-list

IGMPversion2 IGMPversion3 ˘ ʒ ʃ Ʊ Â ʒ
ʃ ў ЮÂ ʒ no ʃ ╖ Â

ip igmp immediate-leave group-list *access-list*

no ip igmp immediate-leaveno

३	/I	
	-	-

46.1.4 ip igmp last-member-query-count

last-member-query-count leave /I˘ Â
३ **last-member-query-count** Â no ३ Â

ip igmp last-member-query-count *number*

no ip igmp last-member-query-count

number	/I Ė ъ

ip igmp last-member-query-interval *interval*

no ip igmp last-member-query-interval

interval	ѝ <1-255>˘ Æ ѝ 0.1s

1s

٣

IGMPv2 ˘ **ip igmp last-member-query-count**
╗ Э ˘ ˘
Â

ЛЬЮ 20 '

```
Ruijie# configure terminal
Ruijie(config)# interface eth 0
Ruijie(config-if)# ip igmp last-member-query-interval 200
```

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ip igmp immediate-leave	-

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-	-

46.1.6 ip igmp limit ( )

٣ igmp states Â ٨ ˘ no Â

ip igmp limit *number* [*except access-list*]

no ip igmp limit

number	IGMP ˘ ɛ Â

except	ˆ ˩ ˜ access-list a б ˇ a ˬ limit ⁸ Â
access-list	ˆ ˩ ˜ ˩ Â

ˬ 1024 Â

ʒ Â

ʒ IGMP ⁸ˇ ⁸ ˦ a IGMP ˇ a Â

ʒ ˩ЛЦ ˇ ˩ЛЦ ˇ Â

ЛЦЮ ⁸ ˬ 300

```
Ruijie(config-if)# ip igmp limit 300
```

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46.1.7 ip igmp limit ( )

ʒ ˩ЛЦ igmp Â ˬ ˇ no Â

ip igmp limit *number* [*except access-list*]

no ip igmp limit *number* [*except access-list*]

number	IGMP ˇ ɛ Â
except	ˆ ˩ ˜ access-list a б ˇ a ˬ limit ⁸ Â
access-list	ˆ ˩ ˜ ˩ Â

й 65536

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S*Ĝ ३ ò @ ↓ ֽ

Ruijie(config-if)# **ip igmp mroute-proxy** *fa 0/1*

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46.1.9 ip igmp proxy-service

٦ ╟ Ю mroute-proxy ╘╖ Â Э ٦˘
й mroute-proxy Э ˘ Ю ˘ Ю Э Â

ip igmp proxy-service

no ip igmp proxy-service

-	-

a й proxy-service Â

Â

٦ ٧ ⁸˘ ٧ 32 Â IGMP Proxy
╖ ٧ Â ٨˘
proxy-service ˘ Â proxy-service
ÿ mroute-proxy Â ˘
proxy-service˘ ٧ ў й˘ a й .
switchport ˘ Ю **ip igmp mroute-proxy**
interface ٦ ╟ Â

й proxy-service
qÔ "WRA Dïf„ •T8 rNû •T P #!•" Â óq• 4r ¾@A ••

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46.1.10 ip igmp query-interval

ʒ ˘ ɻ ɲ no ɨ Â

ip igmp query-interval *seconds*

no ip igmp query-interval

seconds	Â Æ s˘ 1˙ 18000

125 Â

ʒ Â

ɻ ɲ ˘ ɻ Â

1' Ethernet 0 ˘ ɨ 120s Â

```
Ruijie(config-if)# ip igmp query-interval 120
```

2' Ethernet 0 ˘ ɨ Â

```
Ruijie(config-if)# no ip igmp query-interval
```

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46.1.11 ip igmp query-max-response-time

३ ˘ ⊿Ʊ no ѝ Â

ip igmp query-max-response-time *seconds*

no ip igmp query-max-response-time

seconds	˘ Æ š˘ 1˙ 25

10s

३ Â

३ ⊿ IGMPv2 Â ३ 8
Â

1' Ethernet 0 ˘ ѝ 20s Â

```
Ruijie(config-if)# ip igmp query-max-response-time 20
```

2' Ethernet 0 ˘ ѝ Â

```
Ruijie(config-if)# no ip igmp query-max-response-time
```

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46.1.12 ip igmp query-timeout

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ѝ Â

ip igmp query-timeout *seconds*

no ip igmp query-timeout

seconds	è ˘ Æ ѝ š˘ 60˙ 300

255s

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٣ IGMPv2 Â Ю ч **ip igmp query-interval** ˘ Ruijie Ю й 255s Â ˘ ˘ й Â

1' Ethernet 0 ˘ è 200s Â

```
Ruijie(config-if)# ip igmp query-timeout 200
```

2' Ethernet 0 ˘ è й Â

```
Ruijie(config-if)# no ip igmp query-timeout
```

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46.1.13 ip igmp robustness-variable

٣ ٨ Л∪ ٨ ٨ ˘ ˘ ٣ ╗ no Â

ip igmp robustness-variable *number*

no ip igmp robustness-variable

number	٨ ˘ й è 2-7 Ê

й 2'

٣ Â

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46.1.15 ip igmp ssm-map static

३ Ю ssm-map ˘ ३ й'

ip igmp ssm-map static *access-list a.b.c.d*

no ip igmp ssm-map static

no ip igmp static-group *group-address*

group-address	Э ╖ Â

╖ Â

٦ Â

٦ ˘ ╖ Â

Ю ˘ 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
```

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46.1.17 ip igmp version

٦ IGMP /ł Â ˘ no Â

ip igmp version {*1* | *2* | *3*}

no ip igmp version

{*1*	*2*	*3*}	Ь /ł˘ ŭ <1-3>

३

igmp ∧˘ ∧˘ igmp ╠ Â

ЛъЮ ∧ и 2'

```
Ruijie# configure terminal
Ruijie(config)# interface ethernet 0
Ruijie(config-if)# ip igmp version 2
```

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46.2

46.2.1 clear ip igmp group

३ IGMP ╠ Â

clear ip igmp group[*group-address* | *interface-type interface-number*]

	Â
group-address	32 Æ IP D ˘ 8 Æ ˘ Лъ ˘ Â
interface-type	Â
interface-number	∧ Â

३ Â

IGMP ˘ и ѐ ў ╗ ’

≠ ╗ ˘ ≠ Â ÿ IGMP ˘ ┘

Л∪ a **clear ip igmp group** ঽ Â

'

```
Ruijie# clear ip igmp group
```

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46.2.3 show ip igmp groups

३ б ÿ IGMP ˝ Â

show ip igmp groups [*group-address* | *interface-type interface-number*] [*detail*]

group-address	32 Æ IP D ˘ 8 Æ ˘ Лu ⁸ ˘ Â
interface-type	Â
interface-number	Л Â
detail	Â
	Â

३ Â

३ a à Э Â
Â

1' Ю '

```
Ruijie# show ip igmp groups
IGMP Connected Group Membership
Group Address Interface Uptime Expires  Last Reporter
224.0.1.1       eth2  00:00:09  00:04:17  10.10.0.82
224.0.1.24      eth2  00:00:06  00:04:14  10.10.0.84
224.0.1.40      eth2  00:00:09  00:04:15  10.10.0.91
224.0.1.60      eth2  00:00:05  00:04:15  10.10.0.7
239.255.255.250 eth2  00:00:12  00:04:15  10.10.0.228
239.255.255.254 eth2  00:00:08  00:04:13  10.10.0.84
```

2' Ю '

```
Ruijie# show ip igmp groups 224.1.1.1 detail
Interface: eth1
Group: 224.1.1.1
```

```
Uptime: 00:00:42
Group mode: Include
Last reporter: 192.168.50.111
TIB-A Count: 2
TIB-B Count: 0
Group source list: (R - Remote, M - SSM Mapping)
Source Address Uptime v3 Exp Fwd Flags
192.168.55.55 00:00:42 00:03:38 Yes R
192.168.55.66 00:00:42 00:03:38 Yes R
```

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46.2.4 show ip igmp interface

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

interface-type	
interface-number	४

३

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
```

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46.2.5 show ip igmp ssm-mapping

ȝ IGMP ssm-map ˇ ȝ Ю'

show ip igmp ssm-mapping (*A.B.C.D*)

A.B.C.D	

IGMP ssm-map Â

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1' ssm-map

```
Ruijie# sh ip igmp ssm-mapping
```

```
SSM Mapping : Enabled
Database    : Static mappings configured
  2'        233.3.3.3
Ruijie#show ip igmp ssm-mapping 233.3.3.3
```

47 PIM-DM

47.1 PIM-DM

47.1.1 ip pim dense-mode

Э PIM-DM **ip pim dense-mode** ٦ Â ٦ no Э PIM-DM Â

ip pim dense-mode PIM-DMPIM-DM · ~ > `ÍC›q•±x'"

no ip pim dense-mode

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PIM-DM Â

PIM-DM

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47.1.3 ip pim override-interval

hello override-interval ˇ **ip pim override-interval** ȝ Â

ȝ no ȷ ȷ hello override-interval Â

ip pim override-interval *interval-milliseconds*

no ip pim override-interval

interval-milliseconds	ȷ <1-65535> Æ ȕ

2500

ȝ

override-interval ⅔ ā Â

Ю override-interval ȕ 3000 Â

```
Ruijie# configure terminal
Ruijie(config)# interface fastethernet 0/1
```

47.1.4 ip pim query-interval

hello interval ˘ **ip pim query-interval** ৡ Â

ৡ no ৲ Ո hello interval Â

ip pim query-interval *interval-seconds*

no ip pim query-interval

interval-seconds	৲ ӥ <1-65535>˘ Æ ӥ

30 Â

ৡ

hello intervaľ hello holdtime ӥ hello interval 3.5 Â

```
Ruijie# configure terminal
Ruijie(config)# interface fastethernet 0/1
Ruijie(config-if)# ip pim query-interval 123
```

	interval-milliseconds	¼ <1-32767>˘ Æ ½

500

¾

propagation-delay Â

Ю propagation-delay ½ 600 Â

```
Ruijie# configure terminal
Ruijie(config)# interface fastethernet 0/1
Ruijie(config-if)# ip pim propagation-delay 600
```

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ip pim state-refresh disable

PIM-DM

origination-interval *65*

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47.2 PIM-DM

47.2.1 show ip pim dense-mode interface

PIM-DM ˘ **show ip pim dense-mode interface** ¸Â

show ip pim dense-mode interface [*interface-type interface-number*] [*detail*]

interface-type interface-number	/I

VIF Index VIF

```
Downstream IF List:
FastEthernet 0/45:
Downstream State: NoInfo
Assert State: Loser, AT:170
```

Uptime/Expires	Л
Ver	PIM

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47.2.4 show ip pim dense-mode nexthop

PIM-DM Ю ˘

Metric	
Pref	″I

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47.2.5 show ip pim dense-mode track

PIM-DM ˘ show ip pim dense-mode track ¾ Â

show ip pim dense-mode track

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ÿ PIM Â ╟ ˘
˘ clear ip pim dense-mode track ˘
PIM Â

Ю **show ip pim dense-mode track**

```
Ruijie# show ip pim dense-mode track
              PIM packet counters
Elapsed time since counters cleared: 00:04:03
                       received    sent
Valid PIMDM packets:      1           8
Hello:                    1           8
Join/Prune:               0           0
Graft:                    0           0
Graft-Ack:                0           0
```

```
Assert:                    0           0
State-Refresh:             0           0
PIM-SM-Register:           0           0
PIM-SM-Register-Stop:      0           0
PIM-SM-BSM:                0            0
PIM-SM-C-RP-ADV:           0            0
Unknown Type:              0
Errors:
Malformed packets:         0
Bad checksums:             0
Unknown PIM version:       0
Send errors:                  0
```

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show ip pim dense-mode track	PIM

48 PIM-SM

48.1 PIM-SM

48.1.1 clear ip mroute

clear ip mroute {* | *group_address* [*source_address*] }

*	pimsm Â
group_address	pimsm Â
group_address source_address	pimsm Â

a

¾

‖ pimsm

```
Ruijie# clear ip mroute *
Ruijie# clear ip mroute 224.2.2.2
Ruijie# clear ip mroute 224.2.2.2 2.2.2.2
```

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48.1.2 clear ip mroute statistics

clear ip mroute statistics {* | *group_address* [*source_address*] }

*	pimsm Â
group_address	pimsm Â
group_address source_address	pimsm Â

a

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╟ pimsm

```
Ruijie# clear ip mroute statistics *
Ruijie# clear ip mroute statistics 224.2.2.2
Ruijie# clear ip mroute statistics 224.2.2.2 2.2.2.2
```

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Ruijie# **clear ip pim sparse-mode bsr rp-set** *

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╠ ˘ ३ Â Э ╠ pimsm ˘ ≠ ३˘
‡˘ **ip pim sparse-mode** ३˘ pimsm ╠ Â

```
Ruijie (config)# ip multicast-routing
```

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48.1.6 ip pim accept-bsr list

ip pim accept-bsr list { *<1-99>* | *<1300-1999>* | *WORD* }

<1-99>	*<1300-1999>*	IP acl Â
WORD	IP ♩ acl

PIMSM BSM Â

३

PIMSM Э ३˘ BSR Â

```
Ruijie# configure terminal
Ruijie(config)# ip pim accept-bsr list 1
```

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48.1.7 ip pim accept-crp list

ip pim accept-crp list {*<100-199>*|*<2000-2699>*|*WORD*}

<100-199>|*<2000-2699>*	IP acl Â
WORD	IP ɹ acl

BSR RP Â

ʒ

BSR Э ʒ˘ BSR й BSR ˘ C-RP
ɛ Ł ⁸ Â

```
Ruijie# configure terminal
Ruijie(config)# ip pim accept-crp list 100
```

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48.1.8 ip pim accept-crp-with-null-group

ip pim accept-crp-with-null-group

	Ruijie (config)# **access-list** 100 **permit ip** 192.168.195.0 0.0.0.255 225.1.1.1 0.0.0.255

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access-list	-

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48.1.10 ip pim bsr-candidate

ip pim bsr-candidate *interface-type interface-number* [*hash-mask-length*] [*priority-value*]

interface-type interface-number	
hash-mask-length	ɹ ˘ ɻ й <0-32>˘ й RP ⁸ HASH ˘ 10
priority-value	ɹ ˘ ɻ й <0-255>˘ BSR ˝I ˘ 64

˘ a ʢ˘ a BSR

ʢ

PIM-SM ˘ BSR Â BSR RP Â BSR Ὼ BSR Â BSR ˘ C-BSR й BSR˘ PIM-SM Ꭻ 224.0.0.13 ˘ BSR ˝I Â

ʢ ɹ Ꭻ ᚁ BSR PIM ˘ ˝I BSR ɹ ˘ ˘ й BSR ˘ ' ‡ Â BSR й BSR˘ ÿ ʌ BSR ˘ ʌ BSR ˝I ˆ ˝I ˘ IP ˜ Â

Ruijie# **configure terminal**
Ruijie(config)# **ip pim bsr-candidate g 0/3**
Ruijie(config)# **ip pim bsr-candidate g** *0/3 30 192*

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48.1.11 ip pim bsr-border

ip pim bsr-border

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˘ a ˀ˘ a BSR

ѝ ⁸ BSM ˘ ˩Л∪ Э BSR ˘ BSM Л
˘ BSM ≠ a ÿ Â

g 0/3 Э BSR
Ruijie# **configure terminal**
Ruijie(config)# **interface g** *0/3*
Ruijie(config-if)# **ip pim bsr-border**

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48.1.12 ip pim dr-priority

ip pim dr-priority *priority-value*

priority-value	″I ˘ ˘ ″I Â ѝ' <0-4294967294>˘ ѝ' 1 Â

˘ DR ″I ѝ 1

३

DR ˘ Ю '
Â ↵ hello ″I ˘ ѫ DR ˘ ″I
″I ˘ ″I ˘ ѝ DR' ↵ ″I ˘ ѫ˘
IP ˘ DR Â
Â ↵ hello ″I ˘ ѫ
DR ˘ IP ˘ DR Â

```
Ruijie# configure terminal
Ruijie(config)# interface g 0/3
Ruijie(config-if)# ip pim dr-priority 10000
```

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48.1.13 ip pim ignore-rp-set-priority

ip pim ignore-rp-set-priority

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ˇ rp-set rp ˝l

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rp ˇ rp ˝l ˇ ৡ

```
Ruijie# configure terminal
Ruijie(config)# ip pim ignore-rp-set-priority
```

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48.1.14 ip pim jp-timer

jp-t 0.0 Sp-timer -5(s)-3(eonfds)]TJ 0.Tc 11.02 0 0 10.02 135.36 433.2403

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˘ ╗ PIM ˘ ⁸ Â ¼
˘ ‡ PIM-SM a б ^ peering˜ ˘ б
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```
Ruijie# configure terminal
Ruijie(config)# interface g 0/3
Ruijie(config-if)# ip pim neighbor-filter 14
Ruijie(config-if)# exit
Ruijie(config)#access-list 14 deny 192.168.1.5 0.0.0.255
```

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access-list	-

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48.1.17 ip pim neighbor-tracking

ip pim neighbor-tracking

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˘ ╗ ⁸ ╠ Â

join ˘ ˛ Ю ˘ Â

Ю ╕ 8

```
Ruijie# configure terminal
Ruijie(config)# interface g 0/3
Ruijie(config-if)# ip pim neighbor-tracking
```

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ip pim propagation-delay	-

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48.1.18 ip pim override-interval

ip pim override-interval *interval-milliseconds*

interval-milliseconds	↓ <1-65535>˘ Æ и

˘ Hello Override-Interval 2500

Override-Interval Â

⅔ ā ˘

J/P-override-interval Â Э J/P-override-interval

Join-Prune holdtime˘ ‡ ↓ Â ˘

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ip pim propagation-delay-	-

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48.1.19 ip pim propagation-delay

ip pim propagation-delay *interval-milliseconds*

interval-milliseconds	ل <1-32767>ّ Æ ى

ّ Hello Propagation_Delay 500

٦

propagation-delay Â

⅔ ã ّ

J/P-override-interval Â Э J/P-override-interval Ш ﺋﭖ

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48.1.20 ip pim probe-interval

ip pim probe-interval *interval-seconds*

interval-seconds	५ ŷ <1-65535>˘ Æ ŷ

˘ Ą 5s

३

Ą ˘ Ą ⁸ ˘ DR RP Ą
NULL-Register Â

&	Ą a Ą ⁸ ˘ ‡˘ a ╖ Â ɜ Warning Â ɜ 3* Ą ⁸ + Ą a 65535˘ ‡˘ Warning Â

Ю Ą ŷ 6s

```
Ruijie# configure terminal
Ruijie(config)# ip pim probe-interval 6
```

३	

˘ hello 30s

३

Hello ˘ Hello ≠ ЛЮ ‡ ' Hello
ѝ Hello 3.5 ' Hello * 3.5 >
65535˝ з Hello ⁸ ѝ 18725 Â

```
Ruijie# configure terminal
Ruijie(config)# interface g 0/3
Ruijie(config-if)# ip pim query-interval 123
```

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48.1.22 ip pim register-decapsulate-forward

ip pim register-decapsulate-forward

RP a ЎĄ è Â

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RP Э ३ pimsm ЎĄ
è Â

˚ ЎĄ è ˘
ЎĄ Ю˘ Ⅱ ˘
cpu ' a ३ Â

```
Ruijie# configure terminal
Ruijie(config)# ip pim register-decapsulate-forward
```

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48.1.23 ip pim register-checksum-wholepkt

ip pim register-checksum-wholepkt [**group-list** *access-list*]

access-list	access-list <1 99> <1300 1999> acl group-list access-list

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48.1.24 ip pim register-rate-limit

ip pim register-rate-limit *rate*

rate	register ˘ ¼ <1-65535>

˘ a ¨Ą

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ˆ S˜ G˜ ¨Ą ˘ a ¨Ą Â ╟ ¾ æ DR RP ˘ a ⁸ ¨Ą Â

```
Ruijie# configure terminal
Ruijie(config)# ip pim register-rate-limit 3000
```

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48.1.25 ip pim register-rp-reachability

ip pim register-rp-reachability

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Ruijie(config)# **ip pim register-source** *192.168.195.80*
Ruijie(config)# **ipv6 pim register-source g** *0/3*

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48.1.27 ip pim register-suppression

ip pim register-suppression *seconds*

seconds	¨Ą ⁸ ˘ ↓ <1-65535>˘ Æ ѝ Â

˘ ¨Ą ⁸ 60 Â

DR Э Ћ DR Э ¨Ą ⁸ ' ip pim rp-register-kat ¾ ˘ RP Э Ћ RPkeepalive Â

Ruijie# **configure terminal**
Ruijie(config)# **ip pim register-suppression** *100*

ip pim rp-address *rp-address* [*access_list*]

rp-address	RP ip
access_list	˩ ˇ access-listť acl ѝ <1-99> ầ <1300-1999>’ ≠ ˩ acl Â ˇ Â

ˇ rp

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RPˇ ≠ RP BSR ⁸ ˩ Â
ֽ Ю '
Â BSR ⁸ RP ˩ ˇ ˮI ╟ Â
Â RP ˩ Л∪ ^ ACL˜
^ a ACL˜ ˇ RP a Â
Â RP ┗ ˩ ˇ RP ˮI Â
Â ˩ ACL Ⱨ Â ACL ˇ ѝ
224/4 Â
Â ˥ˇ RP RP ˇ
RP ˇ IP Â ѝ
RPˇ ˇ ≠ IP ˮI Э Â
Â RP ˇ ÿ
ѝ RP Â

```
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
```

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ֽ	
access-list	-

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48.1.29 ip pim rp-candidate

ip pim rp-candidate *interface-type interface-number* [**priority** *priority-value*] [***i*nterval** *interval-seconds*][**group-list** *access_list*]

interface-type interface-number	
priority-value	٦ ˘ ٧ ѝ <0-255>˘ priority priority-value ˘ ˮI 192
Interval-seconds	٦ ˘ ٧ ѝ <1-16383>˘ interval interval-seconds ˘ interval-seconds 60s
access_list	٦ ˘ acl ѝ 1-99ʾ ≠ ٫ aclˈ group-list access_list ˘ Â

˘ Э RP

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PIM-SM ˘ … RPT Л℧ RP ѝ ˘ ѝ Л Â RP RP Â BSR Л˘ C-RP BSR C-RP ˘ ЎĄ BSR PIM Â

ѝ rp˘ ѫ ֽ ٦ Л℧ Э acl Â ٧ permit ace˘ a deny ace Â

```
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
```

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ֽ	
access-list	-

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48.1.30 ip pim rp-register-kat

ip pim rp-register-kat *seconds*

seconds	KAT Â¼ <1-65535>˘ Æ½ Â

˘ RP Э KAT 210s Â

¾

rp kat

```
Ruijie# configure terminal
Ruijie(config)# ip pim rp-register-kat 250
```

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¼

╟ PIM-SM ˘ Ю ╟ ╖ ˘

&

rp spt ৶ ৷ ˘ ৡ'

৶ SPT ˘ ‡ Э group-list

a group-list ˘ SPT Â

```
Ruijie# configure terminal
Ruijie(config)# ip pim spt-threshold
Ruijie(config)# ip pim spt-threshold group-list 12
Ruijie(config)# access-list 12 permit 225.1.1.1 0.0.0.255
```

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ৡ	
access-list	-

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48.1.33 ip pim ssm

ip pim ssm { **default** | **range** *access_list*}

default	৷' 232/8
access_list	acl ৷ 1-99' ≠ ৶ acl

SSM

ৡ

╟ pim ssm ╟ pim ssm˘ ৡ Â

1' Ю ৡ 232/8 Â

```
Ruijie# configure terminal
Ruijie(config)# ip pim SSM default
```

2' Ю ৡ ৷ 10 Â

```
Ruijie(config)# ip pim SSM range 10
Ruijie(config)# access-list 10 permit 232.0.0.1 0.0.0.255
```

¾	
access-list	-

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48.1.34 ip pim triggered-hello-delay

ip pim triggered-hello-delay *interval-seconds*

interval-seconds	<1-5>

˘ Triggered-Hello-Delay 5s Â

Triggered-Hello-Delay Â • ╟
˘ Triggered-Hello-Delay ˘ ˘
hello Â

Ю Triggered-Hello-Delay 3s Â

```
Ruijie# configure terminal
Ruijie(config)# interface g 0/3
Ruijie(config-if)# ip pim triggered-hello-delay 3
```

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48.2 PIM-SM

48.2.1 show debugging

show debugging

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```
Ruijie #show debugging
ЮO show debugging
Ruijie #show debugging
ip packet debug:
ip packet debug debugging is on, acl: 0
```

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/I Ń ľ ð l e º é

/ /

BSR

```
Ruijie# show ip pim sparse-mode bsr-router
IO  show ip pim sparse-mode bsr-router
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
```

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48.2.3 show ip pim sparse-mode interface

show ip pim sparse-mode interface [*interface-type interface-number* [**detail**]]

interface-type interface-number	
detail	

a

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PIM SM ˘ ЛЬЮ Ь ३ Â

```
Ruijie#show ip pim sparse-mode interface g 0/4 detail
Ruijie#show ip pim sparse-mode interface
Ruijie#show ip pim sparse-mode interface g 0/3
```

Ю **show ip pim sparse-mode interface detail**

```
Ruijie #show ip pim sparse-mode interface detail
GigabitEthernet 0/3 (vif 3):
  Address 30.30.100.200, DR 30.30.100.200
  Hello period 30 seconds, Next Hello in 11 seconds
  Triggered Hello period 5 seconds
  Neighbors:
   2.2.2.2
```

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48.2.4 show ip pim sparse-mode local-members

show ip pim sparse-mode local-members [*interface-type interface-number*]

interface-type interface-number	Л ˘ ˘ ३

a

३ / /

PIM-SM

Ruijie# **show ip pim sparse-mode mroute**

Ruijie# **show ip pim sparse-mode mroute** *40.40.40.11*

Ruijie# **show ip pim sparse-mode mroute** *235.0.0.1*

Ruijie# **show ip pim sparse-mode mroute** *235.0.0.1* 40.40.40.11

Ю **sh ip pim sparse-mode mroute**

Ruijie (config-if)#**sh ip pim sparse-mode mroute**

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48.2.6 show ip pim sparse-mode neighbor

show ip pim sparse-mode neighbor [**detail**]

detail	ˇ

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Ruijie# **show ip pim sparse-mode neighbor**

Ruijie# **show ip pim sparse-mode neighbor detail**

Ю **show ip pim sparse-mode neighbor**

Ruijie (config-if)#**sh ip pim sparse-mode neighbor**

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48.2.7 show ip pim sparse-mode nexthop

show ip pim sparse-mode nexthop

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/ /

Ю ˘ Ю /ˇ ˘ metric Â

```
Ruijie# show ip pim sparse-mode nexthop
```

३ / /

Э rp˘ Л Ь

```
Ruijie #show ip pim sparse-mode rp mapping
Ю
Ruijie (config)#sh ip pim sparse-mode rp mapping
PIM Group-to-RP Mappings
Group(s): 224.0.0.0/4
RP: 30.30.200.1
Info source: 30.30.200.1, via bootstrap, priority 192
Uptime: 00:00:51, expires: 00:01:39
RP: 30.30.100.1
Info source: 30.30.200.1, via bootstrap, priority 192
Uptime: 00:19:14, expires: 00:01:38
Group(s): 224.0.0.0/4, Static
RP: 100.100.100.100
Uptime: 00:45:35
```

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48.2.9 show ip pim sparse-mode rp-hash

show ip pim sparse-mode rp-hash *group-address*

group-address	

a

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RP Â

Ruijie# **show ip pim sparse-mode rp-hash** *225.1.1.1*

Ю

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

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48.2.10 show ip pim sparse-mode track

show ip pim sparse-mode track

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ÿ ˘ PIM Â ╟ ˘ ˘ clear ip pim sparse-mode track ˘ PIM Â

Ю **show ip pim sparse-mode track**

```
Ruijie # show ip pim sparse-mode track
             PIM packet counters track
Elapsed time since counters cleared: 00:04:03
                        received   sent
Valid PIMSM packets:    0          8
```

```
Hello:                    0           8
Join-Prune:               0           0
Register:                 0           0
Register-Stop:            0           0
Assert:                   0           0
BSM:                      0           0
C-RP-ADV:                 0           0
PIMDM-Graft:              0
PIMDM-Graft-Ack :         0
PIMDM-State-Refresh:      0
Unknown PIM Type:         0
Errors:
Malformed packets:                    0
Bad checksums:                        0
Send errors:                          0
Packets received with unknown PIM version:    0
```

49 IPv4

49.1 IPv4

49.1.1 clear ip mroute

٦ IP Â

clear ip mroute {* | *group-address* [*source -address*]}

*	Â
group-address	Â
source -address	Â

٦ Â

ЛЬЮ й й 230.0.0.1 '

```
Ruijie# clear ip mroute 230.0.0.1
```

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show ip mroute	Â

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49.1.2 clear ip mroute statistics

IPv4

rpf-address	
interface-type interface-number	/ı
distance	˘ ¤ RPF Â ŕ Ơ ↵ ŕ <0-255>

a *Distance*˘ *Distance* ŕ 0

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ʒ ″I ⌐ ˘ ў RFF
Â ″I ÿ ⌐ Â
Ю ip˘ ж ŕ Â
rpf ‡ ' ÿ ˘ ↵ bgp
˘ ‡ ″I’ ÿ ’ γ
˘ ŕ rpf ’ ↵ distance˘ distance
ŕ rpf ’ distance ↵˘ ŕ rpf

ЛЪЮ ↵ 172.30.10.13ʺ

```
Ruijie(config)# ip mroute 172.16.0.0 255.255.0.0  172.30.10.13
```

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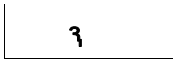
49.1.4 ip multicast boundary

IP IP Â ʒ **no** Â

ip multicast boundary *access-list*

no ip multicast boundary *access-list*

access-list	IP access-list ŕ ACL



IP IP Â ३ ACL ৸ Л৬ ACL˘ ≠ ৸ Л৬
ACL˘ ACL ৸ ৭ ˘ a ৭ Â

३ ৸ Л৬ IP IGMP à PIMSM

˘ [illegible]

limit ٭ 1024

threshold ٭ 2147483647

٦ Â

٦ ⁸ ╗ IPv6 Â

a ⅄ Λ ˚ ˘ ˚ ˚ ˘

Ю Â

ЛυЮ ⁸ ٭ 500 Â

```
Ruijie(config)# ip multicast route-limit 500
```

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49.1.6 ip multicast-routing

٦ ╟ Â ٦ **no** Â

ip multicast-routing

no ip multicast-routing

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٦ ╟ IPv4 Â ╟ IPv4 ˘ ≠ a ╟ Â

	╠ IPv4 ╖ ˘ ʒ Â ╖ IGMP snooping ╖ ˘ ╠ IGMP snooping ╖ ˘ ʑ ʒ a Â
	& a ⅄ ⅄ Э a ⅄ a ⅄ v4

ЛЬЮ ╠ Â

```
Ruijie(config)# ip multicast-rounting
```

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49.1.7 ip multicast static

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ip multicast static *source-address group-address interface-type interface-number*

no ip multicast static *source-address group-address interface-type interface-number*

source -address	Â
group-address	Â
interface-type interface-number	γ

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⁸˘ ⅄ ⅄ Â ѐ
a Â
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ˆ ' PIM-DM PIM-SM˜ ╠ ˘ Л Ь

ù Ÿ Â

ЛЬЮ (192.168.43.4 225.1.1.5) ÿ GigabitEthernet 2/6 FastEthernet 3/2 Â

```
ruijie(config)# ip multicast static 192.168.43.4 225.1.1.5 G2/6
ruijie(config)# ip multicast static 192.168.43.4 225.1.1.5 F3/2
```

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49.1.9 ip multicast rpf longest-match

RPF ‡† ÿ àMBGP à ل ل RPF
à MBGP Â

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٩˘ ÿ Ь ٦ ’ ″I ل˘ ‡
à MBGP à Â

٩ **no** ٩ Â Ю˘ ÿ Ь ″I
’ ″I ل˘ ‡ àMBGP à
Â

ip multicast rpf longest-match

no ip multicast rpf longest-match

RPF ‡† ÿ à MBGP à ل ل RPF
àMBGP Â ÿ Ь ″I ’
″I ل˘ ‡ àMBGP à Â

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ЛЬЮ ٦

```
Ruijie(config)# ip multicast rpf longest-match
```

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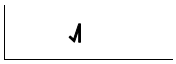
-	-



FastEthernet 1/3

2' 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

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

4' 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

IPv4

```
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
```

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49.2.4 show ip mvif

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show ip mvif { *interface-type interface-number* }

interface-type interface-number	

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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
```

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49.3 IP

49.3.1 debug nsm mcast all

Â ¸ **no**

debug nsm mcast all

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```
Ruijie# debug nsm mcast all
```

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49.3.5 debug nsm mcast vif

Â ¾ **no**

debug nsm mcast vif

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```
Ruijie# debug nsm mcast vif
```

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50 IPv6

50.1

50.1.1 ping ipv6

ৡ IPV6 Â

ping ipv6 [*ipv6-address*]

ipv6-addres	*s*

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```
Ruijie# ping ipv6 fec0::1
```

ping /ׁ ׇ ׄ

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D	Down IPV6 ╖ (ă)
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50.1.2 ipv6 address

й IPV6 , ʒ no Â

ipv6 address *ipv6-address*/*prefix-length*

ipv6 address *ipv6-prefix*/*prefix-length* **eui-64**

ipv6 address *prefix-name sub-bits/prefix-length* [**eui-64**]

no ipv6 address

no ipv6 address *ipv6-address*/*prefix-length*

no ipv6 address *ipv6-prefix*/*prefix-length* **eui-64**

no ipv6 address *prefix-name sub-bits/prefix-length* [**eui-64**]

ipv6-address	IPV6 ˘ RFC4291 Ђ˝ ˘ Л ˘ ´ 16 ˘ Ὼ ⁸ .
ipv6-prefix	IPV6 ˘ RFC4291 Ђ˝ ˘ Л ˘ ´ 16 ˘ Ὼ ⁸ .
prefix-name	ɻ Â Â
sub-bits	б ў Â б Â г б

IPV6 … ɜ ѝ UP ѫ ѝ ╟
Â
IPv6 ≠ ˩ Л∪ ⁸ Â ὲ ⁸ IPv6 = ľ Ŀ +
ľ Ŀ + ľ ў Ŀ Â ˩ Л∪ **ipv6 general-prefix** ϡ ˘ ≠ ˩
DHCPv6 PD˜ ˜ ╖ ˜ ˆ ľ DHCPv6 Ŀ˜ Â ľ
Ŀ + ľ ў Ŀ ϡ *sub-bits/prefix-length* Â
no ipv6 address a έ ˘ ѫ Â
no ipv6 address *ipv6-prefix/prefix-length* **eui-64** ˩ Л∪ ϡ **ipv6 address** *ipv6-prefix/prefix-length* **eui-64** Â

S8600	IPv6 a ˩ ⁸˘ [65,127] IPv6 ѝ 512 Â

1' Ю IPv6 Â

```
Ruijie(config-if)# ipv6 address 2001:1::1/64
Ruijie(config-if)# no ipv6 address 2001:1::1/64
Ruijie(config-if)# ipv6 address 2002:1::/64 eui-64
Ruijie(config-if)# no ipv6 address 2002:1::/64 eui-64
```

2' Ю Â

```
Ruijie(config-if)# ipv6 address my-prefix 0:0:0:7272::72/64
```

my-prefix 2001:1111:2222::/48˝ ѫ IPv6 2001:1111:2222:7272::72/64 Â

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Ipv6 address autoconfig	╟
ipv6 general-prefix	
show ipv6 general-prefix	

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RGOS10.4	IPv6 ˘ ÿ RGOS10.4 Â

50.1.3 ipv6 address autoconfig

IPv6 ╟ ˘ **ipv6 address autoconfig** ϡ˘ ὲ no ╟ Â ϡ Ю'

ipv6 address autoconfig [**default**]

no ipv6 address autoconfig

default	˩ Â Э ˘ ѫ ╟ ˘ Â ˩ ˩ Ь **default** Â

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╟ EUI-64 Â
RA Ľ è Ŀ ˘ ѫ DHCPv6 ˩
Ľ è Ŀ Â Ľ è Ŀ DNS Ŀ IPv6 ą NTP Ŀ IPv6
Â
no ipv6 address autoconfig ʒ Э IPv6 Â

```
Ruijie(config-if)# ipv6 address autoconfig default
Ruijie(config-if)# no ipv6 address autoconfig
```

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ipv6 address *ipv6-prefix/prefix-length* [**eui-64**]	IPv6

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RGOS10.4	ʒ ÿ RGOS10.4 Â

50.1.4 ipv6 enable

ʒ IPv6 ╖ ˘ ʒ no ˩ Л∪ IPv6 ╖ Â

ipv6 enable

no ipv6 enable

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IPv6 ╖ Â

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2 ┘Л Э IPv6 ╖ ˘ Ю **ipv6 enable** ३, γ
Ю IPv6 Â

Э IPv6 ⌘ IPv6 ╖ ╟ ˘
no ipv6 enable ≠ a IPV6 ╖ Â

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

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ʃ ɹ ˘ ɹ Ю ɹ Â
ɹ ʃƱ Â
IPv6 Э Â

Ю ɻ my-prefix Â

```
Ruijie(config)# ipv6 general-prefix my-prefix 2001:1111:2222::/48
```

३	
ipv6 address prefix-name sub-bits/prefix-length	
show ipv6 general-prefix	

ʃ ɹ Â

ʃ	ʃ	
	RGOS10.4	३ ÿ RGOS10.4 Â

50.1.6 ipv6 hop-limit

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ipv6 hop-limit value

no ipv6 hop-limit

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50.1.7 ipv6 nd dad attempts

३ Э ѝ IPV6 ă (NS)
Â ३ no Â

ipv6 nd dad attempts *value*

no ipv6 nd dad attempts

value	(NS) Â ѝ 0 ѝ Э Ipv6 ╟ ă Â : 0-600 Â

1

३

Э IPV6 ˘ ѝ ╟ ă
˘ ”tentative”( ) Â ă ˘
ă ˘ ѫ ⅃ Л ˘ ă ˘ з
EUI-64 ˘ ѫ

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50.1.8 ipv6 nd managed-config-flag

३ Ὼ “**managed address configuration**” Æ˘
३ no Æ Â

ipv6 nd managed-config-flag

no ipv6 managed-config-flag

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

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३	
show ipv6 interface	ra-info Â
ipv6 nd other-config-flag	╟ ऻ Æ Â

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50.1.9 ipv6 nd ns-interval

prefix-length	IPV6 ˘ ╗ Э'/' Â
valid-lifetime	ў Ґ л и Â
preferred-lifetime	ў Ґ л и Â
at *valid-date preferred-date*	Ґ ˘ Лu ã ã ã ã† Â
infinite	Â
default	Â
no-advertise	a Ґ Â
off-link	ў IPV6 ٦ ѫ и л (on-link) Э л Â a on-link Â
no-autoconfig	ў Ґ a ╠ Â

Ґ Э IPV6 address ʒ Â
Ґ Ю'
valid-lifetime: 2592000 (30)
preferred-lifetime: 604800 (7),
Ґ ˘ з л Лu on-link ˘ л Лu ╠

ʒ

ʒ л Лu ˘ Ґ ˘ Ю
Ґ (RA)Ґ Э ipv6 address ʒ ˘
╗ è л Лu ʒ Â

ipv6 nd prefix default

Э ˘ ╗ ˘ ˘
ѫ ipv6 nd prefix default и Â и
Лu л a Ạ и Â Лu л ipv6 nd prefix default
л a ˘ л Â

at *valid-date preferred-date*

2 ' Ґ '
л ˘ ѫ Ґ
˘ и 0 Â

1' SVI 1 Э ╗

```
Ruijie(conifg)#
```

IPv6

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show ipv6 interface	ra-info Â
ipv6 nd ra-interval	Ὼ Â
ipv6 nd ra-hoplimit	Ὼ Â
ipv6 nd ra-mtu	Ὼ MTU Â

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-	-

50.1.12 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

seconds	Ὼ (RA)Ὼ ÂЛυ й æ Â
min-max	Â
min_value	Â
max_value	Â

200 ˘ 200 ЭЮ ╟ 20 Â

ʒ Â

Ἰ ˘ ѫ a Â
ʌ ˘ й Э è ɹ Ὼ ´ ˘ Лυ
Э ╟ ἦ γ Â
min-max˘ ѫ
Â

```
Ruijie(config)# interface vlan 1
Ruijie(config-if)# ipv6 nd ra-interval 110
Ruijie(config-if)# ipv6 nd ra-interval min-max 110 120
```

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٣	
show ipv6 interface	ra-info Â
ipv6 nd ra-lifetime	Â
ipv6 nd ra-hoplimit	Ώ Â
ipv6 nd ra-mtu	Ώ MTU Â

٨

٣

٨	
-	-

50.1.13 ipv6 nd ra-hoplimit

٣ Э Ώ (RA) ˘ ٣ no Â

ipv6 nd ra-hoplimit *value*

no ipv6 nd ra-hoplimit

value	Ώ (RA) Â

64 Â

٣ Â

Ώ Â

```
Ruijie(config)# interface vlan 1
Ruijie(config-if)# ipv6 nd ra-hoplimit 110
```

३	
show ipv6 interface	ra-info Â
ipv6 nd ra-lifetime	Â
ipv6 nd ra-interval	Ώ Â
ipv6 nd ra-mtu	Ώ MTU Â

४
-

50.1.14 ipv6 nd ra-mtu

३ Э Ώ (RA) MTU ॅ ३ no

ipv6 nd ra-hoplimit	Ώ Â

ʎ

३	
ʎ	
-	-

50.1.15 ipv6 nd reachable-time

३ Э NDP ╟ ┘ ʎ˘ й ┘
˘ ३ no Â

ipv6 nd reachable-time *milliseconds*

no ipv6 nd reachable-time

milliseconds	й ┘ ˘ Л∪ й Æ˘ ' 0-3600000

Ώ (RA) й 0( )˘ й
й ┘ й 30000ms(30)

३

٪	
-	-

50.1.16 ipv6 nd suppress-ra

٪ ⁸ Э Ὼ (RA) ˘ ٪ no ÿ
Ὼ (RA) Â

ipv6 nd suppress-ra

no ipv6 nd suppress-ra

-	-

IPv6 Э a Ὼ Â

٪

Э ⁸ Ὼ ⅃ Л ipv6 suppress-ra ٪ Â

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

٪	
show ipv6 interface	ra-info

⅄

⅄	
-	-

50.1.17 ipv6 neighbor

٪ ˘ ٪ no ⅃ Л Â

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

no ipv6 neighbor *ipv6-address interface-id*

ipv6-address	IPV6 ˘ RFC4291 ₩ Â
interface-id	ˆ Routed Port,L3 AP SVI ˜ Â
hardware-address	˘ Л∪ XXXX.XXXX.XXXX 48 Æ MAC ˘ 'X' Ώ ⁸ Â

Â

३ Â

B !•Ð hòB XXXX4.2068.1 Tf 0 Tc 2.407 0 Td [<0D044A-1.8850>Tj 57FF5324 T/TT0 1

ʒˇ 8 ѝ Â ľ **no ipv6**
ns-linklocal-srdľˇ a 8 ѝ ˇ IPv6
RFC3484 Â

ipv6 ns-linklocal-src

no ipv6 ns-linklocal-src

٦

ICMPv6 ٨ ˘ ٦ Л Ц 10
ICMPv6 (10pps) Â

```
Ruijie(conifgf)# interface vlan 1
Ruijie(config-if)# ipv6 redirects
```

٦

٦	
show ipv6 interface	

٨

٦

Л	
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50.1.20 ipv6 route

٦ IPV6 ˘ ٦ 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*]}

ipv6-prefix	IPV6 Л˘ RFC4291 Â
prefix-length	IPV6 ˘ ╗ Э'/'
ipv6-address	Ю ˘ RFC4291 ÂЮ Л Ц Ю Л Â Ю ˘ ж Â
interface-id	˘ Ю ˘ ж й Э˘ Â Ю ˘ ж Â

	Ю ж ˇ з Ю ≠ Â Ю a ˇ Ю ˇ жЮ ┐ Â

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

३	
show ipv6 route	IPV6

/I	
-	-

50.1.21 ipv6 source-route

३ IPv6 ˇ ३ no
IPv6 Â

ipv6 source-route

no ipv6 source-route

-	-

IPv6 Â

Â

й 0 ' IPv6 Â ↓ Ь

IPv6 Â

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

¾	
tunnel source	
tunnel mode	
tunnel ttl	TTL

/\	
-	-

50.1.23 tunnel mode ipv6

¾ IPV6 ˘ ⅃ Л∪ IPv4 IPv6
Â ¾ no Â ¾ Ю'

tunnel mode ipv6

no tunnel mode

-	-

ipv6ip Â

¾

4over6 6over6 Â

```
Ruijie(config)# interface tunnel 1
Ruijie(config-if)# tunnel mode ipv6
Ruijie(config-if)# tunnel source vlan 1
```

¾	
tunnel source	
tunnel destination	
tunnel ttl	TTL

ʃ Â

ʒ	ʃ
RGOS10.4	ʒ ÿ RGOS10.4 Â

50.1.24 tunnel mode ipv6ip

ʒ IPV6 , ʒ no ʒ IPv6 Â

tunnel mode ipv6ip [**6to4** | **isatap**]

no tunnel mode

6to4	ŷ 6to4 ╟ Â
isatap	ŷ ISATAP ╟ Â

… IPv6 ŷ Â

ʒ Â

… ŷ ˘ ʒ tunnel mode ipv6ip a ≠ ŷ Â ╟ ŷ ε Â

Ю 6to4 '

```
Ruijie(config)# interface tunnel 1
Ruijie(config-if)# tunnel mode ipv6ip 6to4
Ruijie(config-if)# tunnel source vlan 1
```

ʒ	/ʃ	
	-	-

50.1.25 tunnel mode gre

ʒ GRE , ʒ no ʒ IPv6
Â

tunnel mode gre [**ip** | **ipv6**]

no tunnel mode

ip	ŭ IPv4
ipv6	ŭ IPv6

… ŭ IPv6 Â

ʒ

… ŭ ˘ ʒ tunnel mode gre ip ipv6 ŭ gre Â ˩ tunnel source, tunnel destination, ʒ destination ˩ ˘ gre UP Â

Ю gre '

```
Ruijie(config)# interface tunnel 1
Ruijie(config-if)# tunnel mode gre  ip
Ruijie(config-if)# tunnel source vlan 1
Ruijie(config-if)# tunnel destination 1.1.1.1
```

ʒ	
tunnel source	
tunnel destination	
tunnel ttl	TTL

˩

ʒ	/ʃ	

-	-

50.1.26 tunnel source

ʒ й è , ʒ no ʒ Â

tunnel source {*ipv4-address* | *ipv6-address* | *interface-type interface-number*}

no tunnel source

ipv4-address	IPv4 ˘ IPv4 й Â
ipv6-address	tunnel mode ipv6 tunnel mode gre ipv6˜ ж IPv6 Â a й Â
interface-type interface-number	˘ ipv6ip˘ ‡ ў ipv4 й IPv4 ’ ipv6˜ ‡

	tunnel destination	
	tunnel ttl	TTL

	M	
¾	-	-

50.1.27 tunnel ttl

IPv6 over IPv4 ˘ ¾ IPv4 TTL Â IPv4 over IPv6 IPv6 over IPv6 ˘ ¾ IPv6 ⁸ Â ¾ no ¾

[redacted]

4 over IPv6 IPv6

/I	Aè
- -	-

ipv6 neighbors

Â

pv6 neighbors

ʒ ˩ Л∪ IPV6 Э à ND Л∪ Â

```
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
```

GEN	Â

```
Ruijie# show ipv6 interface vlan 1 ra-info
vlan 1: DOWN
RA timer is stopped
waits: 0, initcount: 3
statistics: RA(out/in/inconsistent): 4/0/0, RS(input): 0
Link-layer address: 00:00:00:00:00:01
Physical MTU: 1500
ND router advertisements live for 1800 seconds
ND router advertisements are sent every 200 seconds<240--160>
Flags: !M!O, Adv MTU: 1500
ND advertised reachable time is 0 milliseconds
ND advertised retransmit time is 0 milliseconds
ND advertised CurHopLimit is 64
Prefixes: (total: 1)
fec0:1:1:1::/64(Def,Auto,vltime:2592000,pltime:604800, flags: LA)
```

ra-info Ⱨ

RA timer is stopped (on)	Ὼ Â
waits	ὴ ὲ Â
initcount	RA ╟ Ὼ Â
RA(out/in/inconsistent)	Out Ὼ Â in Ὼ Â inconsistent Ὼ Ὼ a Â
RS(input)	Â
Link-layer address	Â
Physical MTU	MTU Â

!M Ȯ$ Ὸ

!M | M

total	Â
fec0:1:1:1::/64	έ Â
Def	Â
Auto | CFG	Auto IPV6 ╟ , CFG Â
!Adv	a Ώ Â
vltime	( ) Â
pltime	( ) Â
L | !L	L on-link Æ Э Â !L б Э ↓ Â
A | !A	A auto-config Æ Э, !A б Э ↓ Â

ʒ

३

1' SVI 1 Э

```
Ruijie# show ipv6 neighbors vlan 1
IPv6 Address Linklayer Addr   Interface
fa::1        00d0.0000.0002   vlan 1
fe80::200:ff:fe00:2  00d0.0000.0002  vlan 1
```

2'

```
Ruijie# show ipv6 neighbors verbose
IPv6 Address  Linklayer Addr Interface
2001::1      00d0.f800.0001 vlan 1
       State: Reach/H Age: - asked: 0
fe80::200:ff:fe00:1    00d0.f800.0001 vlan 1
       State: Reach/H Age: - asked: 0
```

IPv6 Address	IPV6
Linklayer Addr	Mac ˘ ‡ incomplete
Interface	

Interface	
State	STATE Ю' ACTIVE— ╟ INACTIVE— a ╟ ˘ IPV6 ˘ б Э a ٦ ^ a ˘ б ă ~ ˘ a ╟˘ a mac Â

३	
ipv6 neighbor	

/I	
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50.2.5 show ipv6 route

IPV6 Â

show ipv6 route [**static**] [**local**] [**connected**]

static	
local	
connected	

३ ┘Л Â

```
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
```

¾

¾	
ipv6 route	

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50.2.6 show ipv6 router

IPv6 ˘ Ω Â Ω

˘ show ipv6 router ¾ Â è ® A -

ৡ

show ipv6 router Ω Â ˘ ‡
Ω Â

IPv6 ˘ Ю

```
Ruijie# show ipv6 router
Router FE80::2D0:F8FF:FEC1:C6E1 on VLAN 2, last update 62 sec
  Hops 64, Lifetime 1800 sec, ManagedFlag=0, OtherFlag=0, MTU=1500
  Preference=MEDIUM
  Reachable time 0 msec, Retransmit time 0 msec
  Prefix 6001:3::/64 onlink autoconfig
    Valid lifetime 2592000 sec, preferred lifetime 604800 sec
  Prefix 6001:2::/64 onlink autoconfig
    Valid lifetime 2592000 sec, preferred lifetime 604800 sec
```

ৡ	

51 OSPFv3

51.1

51.1.1 area default-cost

stub ш ABR Э ३˘ Ⱶ stub ш ३ˈ Â ३
no Â

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

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

area-id	stub ш ш ᐣ Â è ᒧᑌ ᦈ IPv4 Â
cost	stub ш ३ˈ Â 1-16777214 Â

default-cost ᦈ 1 Â

३ Â

३ ᒣ ᙁ Â

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51.1.2 area range

ʒ ʍ ˘ ʒ **no**
Â

area *area-id* **range** *ipv6-prefix*/*prefix-length* [**advertise|not-advertise**]

no area *area-id* **range** *ipv6-prefix*/*prefix-length*

area-id	ʍ ʌ Â è ˩ Ɲ ʮ IPv4 Â
ipv6-prefix/*prefix-length*	Â
advertise	Ὼ Â
not-advertise	a Ὼ Â ʮ Ὼ Â

ʞ ʍ Â

ʒ Â

ʒ ˩ ABR Ɔ ˘ ʍ ˘ è ʍ
Â ʮ ˩ ʍ ˘ ʍ Ɔ é
˘ è ʍ ˩ Â ɜ ˩ Ɲ advertise
not-advertise ɑ Ὼ ˘ ˘
Ὼ Â ˩ Ɲ cost Â
˩ Ɲ ʞ ʍ ʒ˘ OSPF ˘
˘ Â
˘ ɜ ˘ ɲ ‡
area range Â

Ю ˘ ʍ 1 '

```
ipv6 router ospf 1
area 1 range 2001:DB8:1:2::/64
```

ʒ	
summary-prefix	Â

ʃ

ʒ

ʃ	
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51.1.3 area stub

ʒ … stub ʊ stub ʊ ˘ ʒ **no** ɲ
ʊ stub ʊ Â

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

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

area-id	stub ʊ ʊ ʃ Â è ʃ Ո ɲ IPv4 Â
no-summary	ʃ stub ʊ ABR Ɔ ˘ ABR ʃ 3 LSA Ὼ stub ʊ ˘ a Ἀ Ὼ 3 è LSA Â

ʃ stub ʊ Â

ʒ Â

३	
area default-cost	stub ш ३ Â

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	-	-

51.1.4 area virtual-link

reference-bandwidth *ref-bw*	˘ Л Mbps ѝ Æ Â 1-4294967 Â

˘ ѝ 100Mbps Â

ʒ Â

no auto-cost reference-bandwidth Â

˩ Л Ю ʒ **ipv6 ospf cost** ѝ ʒ˙ ˘ ѐ ″I
Â

Ю ˘ ѝ 10M‴

```
ipv6 router ospf 1
auto-cost reference-bandwidth 10
```

ʒ	
ipv6 ospf cost	ʒ˙ Â
show ipv6 ospf	OSPFv3 Â

˩

˩	
-	-

51.1.6 bfd all-interfaces (OSPFv3)

OSPFv3 BFD ˘ OSPFv3 Ю
bfd all-interfaces Â ʒ no Â

bfd all-interfaces

no bfd all-interfaces

-	-

٦ Â

OSPFv3 Hello ╟ ˘ OSPFv3 ╟ BFD ╖ Л˘ ѝ
FULL BFD ˘ BFD ⁸ ˘ BFD
˘ OSPFv3 Â
≠ ┘ Л∪ ٦ **ipv6 ospf bfd** [**disable**] ╟ BFD
╖ ˘ ″I Ю

Ю ˘ ╟ OSPFv3

enable

clear ipv6 ospf process

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51.1.8 default-information originate

OSPFv3 ˘ ʒ **default-information originate** Â ʒ **no** Â

default-information originate [**always**] [**metric** *metric*] [**metric-type** *type*] [**route-map** *map-name*]

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

always	^ ˩ ~ OSPFv3 ˚ ˘ a Â
metric *metric*	^ ˩ ~ ˘ 0-16777214 Â Ю˘ й 1 Â
metric-type *type*	^ ˩ ~ ÂOSPFv3 ч ' 1˘ a ˩ Э a ' 2˘ Â 1 2 ˩ Â
route-map *map-name*	route-map ˩ , route-map

a ’

й 1’
ðØ,Ø

redistribute **default-information** ʒ ˘ OSPFv3 ╟ ⅃ и
ASBR˜ ˜ Â
redistribute ˘ OSPFv3 Â
ASBR ˘ **default-information originate** ʒ
Â
always ˘ a ˘ OSPFv3
Â a ˘
˘ ⅃Л **show ipv6 ospf database** OSPFv3 ÂOSPFv3
show ipv6 route ʒ˘ ⅃Л Â
˘ ⅃ **default-information originate** ʒ Ⱨ˜ a
ʒ **default-metric** Â
OSPFv3 ч ˘ 1 ⅃˘ 2
a ⅃ Â ч ˘ ⅃ ˘ 1
2 ˝I ˘ Л **show ipv6 route** ⅃ 1 Â
stub Ш a ⅃Л Â

Ю ˘ ↑ '

```
default-information originate always
```

ʒ	
redistribute	↑ Â
show ipv6 ospf	OSPFv3 Â
show ipv6 ospf database	OSPFv3 Â

⅄

⅄	
-	-

ʒ

51.1.9 default-metric

ʒ ↑ ˘ ʒ **no** Â

default-metric *metric-value*

no default-metric

metric-value	↑ Â 1-16777214 Â

20

٦ Â

٦ ٫ **redistribute** ٦ ˘ ǂ Â ٦
ч '
Â **default-information originate** ٦ '
Â ǂ ˘ ǂ 20 й Â

Ю ˘ ǂ metric й 10ʹ
`default-metric 10`

٦	
redistribute	ǂ Â
show ipv6 ospf	OSPFv3 Â

٧

/I	
-	-

51.1.10 distance

٦ a ٫ OSPFv3 ˘ ٦ **no**
Â

distance {*distance* | **ospf** { **intra-area** *distance* | **inter-area** *distance* | **external** *distance* }}

no distance [**ospf**]

distance	˘ ٧ ' 1-255
intra-area *distance*	ш ˘ ٧ ' 1-255
inter-area *distance*	ш ˘ ٧ ' 1-255
external *distance*	˘ ٧ ' 1-255

й 110ƍ

ш ' й 110ƍ

ш ' й 110ƍ

' й 110ƍ א

instance *instance-id*	OSPFv3 0-255 Â

╖ Â

٦ Â

┘Л∪ Ю˘ ″I ٦ ╟ б OSPFv3˘ ″Ą **ipv6 router ospf**
OSPFv3 ˇ OSPFv3 Л˘ ╟ б Â
no ipv6 ospf area ٦ a ″Ą б OSPFv3 Â
no ipv6 router ospf ٦ a ″Ą б OSPFv3 Â
┘ *instance-id* ┘ Â
٦ Л˘ Э б OSPFv3 Â

Ю ˇ int fastethernet 0/0 Э ╟ OSPFv3 ˇ б
Ш '

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

٦ 5eQuBV̈à.Adb6R̂sd6r9V̈â̈Q̈â̈X73V̈â̈79â̈0Ñd.f4Nd.56A(3Â0Ñ̈â̈.UÈOSPF

disable	OSPF BFD ⁸ Â
instance *instance-id*	OSPFv3 0-255 Â

instance *instance-id*	OSPFv3 ˇ 0-255 Â

й /Bandwidthˆ й 100Mbps˜ Â

ч Â

Ю˘ OSPFv3 й 100Mbps/Bandwidth˜ è Bandwidth й
ˇ ч bandwidth Â
ђ OSPFv3 й'
Â 64K ˇ cost й 1562'
Â E1 ˇ cost й 48'
Â 10M Л ˇ cost й 10'
Â 100M Л ˇ cost й 1 Â
ipv6 ospf cost ч OSPFv3 ˇ Â

Ю ˇ ч' й 1'

```
ipv6 ospf cost 1
```

ч	
show ipv6 ospf interface	OSPFv3 Â
ipv6 ospf area	б OSPFv3

Л	
-	-

51.1.14 ipv6 ospf dead-interval

ч Э й ˇ hello й
ˇ ч **no** Â

ipv6 ospf dead-interval *seconds* [**instance** *instance-id*]

no ipv6 ospf dead-interval [**instance** *instance-id*]

seconds	Â 1-65535( ) Â

instance *instance-id*	OSPFv3 ˘ 0-255 Â

ipv6 ospf hello-interval 4 Â

ʒ Â

ɹ˘ ‡ Â

ѝ hello 4 ˘ hello ˘

╟ Â

a ˘ ˘ ˈ

Â hello Â

Â ɹ Â

Ю ˘ ѝ ѝ 60sˈ

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

ʒ

MTU Â

३ Â

OSPFv3 ४

Hello ⊿˘ ‡ Â

Ю ˘ hello й 20s'

```
ipv6 ospf hello-interval 20
```

٦	
ipv6 ospf dead-interval	Э й Â
show ipv6 ospf interface	OSPFv3 Â
ipv6 ospf area	б OSPFv3

٦ /I

/I	
-	-

51.1.17 ipv6 ospf neighbor

٦ OSPFv3 ˘ ٦ **no** Â

ipv6 ospf neighbor *ipv6-address* {[**cost** <1-65535>] | [**poll-interval** <0-2147483647> | **priority**

c e s s

p r i o y

Ⱨ ' ' 120 ' ″I ' ѝ 0 Â

٪ Â

ل Л Ъ ˘ Â

ЛЪЮ ˘ OSPFv3 ˘ IPv6 ѝ 2001:DB8:4::1˘ ″I ѝ 1˘ ѝ 150 Â

```
Ruijie(config)# interface fastEthernet 0/1
Ruijie(config-if)# ipv6 ospf neighbor 2001:DB8:4::1 priority 1
poll-interval 150
```

٪	
Ipv6 ospf priority	″I Â
Ipv6 ospf network	

٪

Л	
-	-

51.1.18 ipv6 ospf network

٪ ˘ ٪ **no** Â

ipv6 ospf network {**broadcast | non-broadcast** | **point-to-point | point-to-multipoint** [**non-broadcast**]} [**instance** *instance-id*]

no ipv6 ospf network [**broadcast | non-broadcast** | **point-to-point | point-to-multipoint** [**non-broadcast**]] [**instance** *instance-id*]

broadcast	Â
non-broadcast	
point-to-point	Â
point-to-multipoint	

point-to-multipoint non-broadcast	
instance *instance-id*	OSPFv3 0-255 Â

Â

ʒ

˩ Л Ъ ˘ Â

Ю ˘ б OSPFv3 ѝ '

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

ʒ

ʒ Â

˘ DR/BDR(/) Â DR/BDR
˘ ˝I ˝I ˙ DR BDR˘ ˝I ˩˘ Router-ID
˘ ˝I ˙ DR BDR Â
˝I ˙˚ ˘ a б DR/BDR Â
DR BDR˘ ж ˝I a ˘ ˩ Ю
DR BDR ˘ б Â

Ю ˘ DR/BDR ˘ a ˝Ą ˙ DR BDR˝

```
ipv6 ospf priority 0
```

ʒ	
ipv6 ospf network	Â
router-id	Â
show ipv6 ospf interface	OSPFv3 Â
ipv6 ospf area	б OSPFv3

˩

/I	
-	-

51.1.20 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*]

seconds	LSA Â 1-65535( ) Â
instance *instance-id*	OSPFv3 0-255 Â

ʒ Â

й ɻ ˘ LSA ˘ Â ɻЛυ
˘ ʒ
˘ LSA Â

Ю ˘ LSA й 10s'
ipv6 ospf retransmit-interval 10

ʒ

ipv6 ospf transmit-delay 2

ʒ	
show ipv6 ospf interface	OSPFv3 Â

ʃ
-

51.1.22 ipv6 router ospf

ʒ OSPFv3 ˘ ʒ **no** OSPFv3 Â

ipv6 router ospf *[process-id]*

no ipv6 router ospf *process-id*

process-id	OSPFv3 ʃ Â ʃ ˘ 1 Â

OSPFv3 Â

ʒ Â

OSPFv3 ʃ˘ Â
˘ ʃ 32 OSPFv3 Â

Ю ˘ ╠ OSPFv3 '

```
ipv6 router ospf 1
```

ʒ	
ipv6 ospf area	б OSPFv3 Â
show ipv6 ospf	OSPFv3 Â

ʃ	

	-	-

51.1.23 log-adj-changes

	number	DD 1-65535

ѝ ˘ a ¨Ą hello Â
ֽ ѵ б OSPFv3 ˘ з a Â

Ю ˘ ѵ VLAN1 б OSPFv3 '

level-1 | **level-1-2** | **level-2**	↙ † IS-IS ˘ level † Â
match	↙ † OSPFv3 ˘ † ' internal' ш б ш ' external [1|2]' E1 à E2
metric *metric-value*	OSPFv3 external 2 LSA metric˘ metric-value metric ˘ ↙ ' 0-16777214
metric-type {*1|2*}	й E-1 E-2
route-map *route-map-name*	† Â map-tag ˩ a 32 Â
tag *tag-value*	† OSPFv3 tag ˘ ↙ ' 0-4294967295

Ћ '
metric-type й 2'
† ISIS ˘ † level-2 '
† OSPFv3 ˘ † OSPFv3 '
route-map Â

ʒ Â

˘ Â
˩ ˘ † ˥ Â
Â
† ISIS ˘ ˥ level-1 à level-2 level-1-2 ˘ †
ISIS level ˘ й † level-2 ISIS Â
† OSPFv3 ˘ ˥ *match* ˘ † OSPFv3 ˘
˘ й † OSPFv3 Â
† ISIS *level* Л∪ OSPFv3 *match* ˘ ↙ ˘
route-map ɔ '
† route-map ‡ *match* ɔ ' †
tag˘ *metric* б *metric-type* ″I æ *route-map* *set*
‡ ″I '

Ю ˘ † ˘ route-map test'

```
ipv6 router ospf 1
redistribute connect metric  10 route-map test
```

й'

```
route-map test permit 10
match metric 20
set metric 30
```

ЛЪЭ ╖ ˘ ǀ metric й 20 ˘ è metric й 30ʼ ǀ è metric й 10Â

ʒ

ʒ	
default-information originate	ǀ Â
default-metric	ǀ Â
summary-prefix	Â
show ipv6 ospf	OSPFv3 Â
show ipv6 ospf database	OSPFv3 Â

ʃ

ʒ

ʃ	
-	-

51.1.27 router-id

ʒ (Router ID)˘ ʒ **no** Router ID˘ Router IDÂ

router-id *router-id*

no router-id

router-id	Â IPv4 Â

OSPFv3 ˆ loopback˜ IPv4 й ' IPv4 ˆ loopback˜ ˘ ж OSPFv3 ʃ è IPv4 й Â

ʒ Â

ʃ OSPFv3 Router ID Â-Ɩ ЛЪ IPv4 й ˘ ʃ

˘ ل ل OSPFv3 ˘ ≠
Â
ل لˇ ˘ Лъ a ў ل ˘
Â ╟ OSPFv3 لˇ ″I
Router IDˇ OSPFv3 ὲ Â

Ю ˘ б OSPFv3 ѝ 1.1.1.1'
```
router-id 1.1.1.1
```

٩	
ipv6 ospf priority	″I Â
show ipv6 ospf	OSPFv3 Â

ل

ل	
-	-

51.1.28 summary-prefix

OSPFv3 ˘ ٩ **summary-prefix** Â
٩ **no** Â

summary-prefix *ipv6-prefix*/*prefix-length* [**not-advertise** | **tag** <*0-4294967295*>]

no summary-prefix *ipv6-prefix*/*prefix-length* [**not-advertise | tag** <*0-4294967295*>]

ipv6-prefix/*prefix-length*	Â
not-advertise	a
tag <*0-4294967295*>	↑ OSPFv3 tag 0-4294967295

Â

٩ Â

ÿ ὲ ↑ ˘ OSPFv3 ˘ ↑ Лъ

OSPFv3 Â
˘ ˩ЛЦ˩ ˘ ÿ Â
б **area range** ʒ a ˩˘ area range OSPFv3 ш ˘
summary-prefix OSPFv3 Â
summary-prefix ʒ ˩ (ASBR) Э ˘ з ˩ ĭ
Â

Ю ˘ 2001:DB8::/64 й 2001:DB8::/64
'

```
summary-prefix 2001:DB8::/64
```

ʒ	
area range	ʒ OSPFv3 ш Â
redistribute	ĭ è Â

˩

/I	
-	-

51.1.29 timers spf

OSPFv3 ˩ ˘ SPF ˘ ЛЦ ч SPF
˘ ˩ ʒ **timers spf** Â ʒ no Â

timers spf *spf-delay spf-holdtime*

no timers spf

spf-delay	Ня SPF ˘ ЛЦ й æ˘ 0-214748364 ( ) ÂOSPF ˩ ˘ /˘ SPF Â
spf-holdtime	Ня ч SPF ˘ ЛЦ й æ˘ 0-214748364 ( ) Â ˘ ч ˘ a SPF Â

ŕ ŭ ЛЬЮ ч '

1 à RGOS 10.4 ˘ a timers throttle spf ʒ Â ŭ timers spf 5 10

2 à RGOS 10.4 ˘ timers throttle spf ʒ Â Ю timers spf ʒ a ˘ SPF Л **timers throttle spf** ʒ ŭ ˘ timers throttle spf ʒ Â

ʒ Â

spf-delay spf-holdtime ˘ OSPF √ ≠ ˘ ≠ ˘ ´ CPU Â

timers spf б timers throttle spf Â

ЛЬЮ ˘ OSPFv3 ŕ ŭ 3 9 Â

```
Ruijie(config)# ipv6 router ospf 20
Ruijie(config-router)# timers spf 3 9
```

ʒ

ʒ	
clear ipv6 ospf	ʒ ╟ OSPFv3 ŕ ╖ Â
show ipv6 ospf	OSPFv3 Â
timers throttle spf	SPF

Ѵ

ʒ

Ѵ	
-	-

51.1.30 timers throttle spf

OSPFv3 √ ˘ 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

spf-delay	Ⱨ SPF ˘ Л ѝ Æ˘ 1-600000 ÂOSPFv3 ˩ ˘ SPF *spf-delay* ˥ Â
spf-holdtime	Ⱨ ч SPF ˘ Л ѝ Æ˘ 1-600000 Â
spf-max-waittime	Ⱨ ч SPF ˘ Л ѝ Æ˘ 1-600000 Â

spf-delay' 1000 '
spf-holdtime' 5000 '
spf-max-waittime' 10000 Â

ʒ Â

spf-delay ÿ ˩ SPF ˘ Â SPF
ɣ SPF ѝ *spf-holdtime*˘ ˥˘ SPF
ѝ Э ч ˘ *spf-max-waittime* ˥˘
a ¨Ą ╗ Â ч SPF ˘ ѫ SPF
ÿ *spf-holdtime* Â
spf-delay *spf-holdtime* ˩Л Л╗ ' *spf-max-waittime* ˩Л
Л SPF ˩ ˥˘¸ Л□

```
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 0x1DDF1
Number of Unknown LSA 0
```

¾

¾	
ipv6 router ospf	╟ OSPFv3 Â
default-information originate	¦ Â
default-metric	¦ Â
router-id	OSPFv3 Â

timers spf	OSPFv3 ˅ SPF ˇ Л∪ ч SPF à Â

˄

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˄	
-	-

51.2.2 show ipv6 ospf database

OSPFv3 Â

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

process- id	OSPFv3 ˄
lsa-type	LSA ˇ ЛЬЮ ' AS-external-LSAs à Link-LSAs à Inter-Area-Prefix-LSAs à Inter-Area-Router-LSAs à Intra-Area-Prefix-LSAs à Network-LSAs à Router-LSAs ˇ LSA
adv-route*r router-id*	router LSA Â

ʒ Â

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
```

¾

¾	
ipv6 router ospf	╟ OSPFv3 Â

¼

¾ Â

IO ¾ OSPFv3

```
Ruijie# show ipv6 ospf interface
FastEthernet 1/0 is up, line protocol is up
Interface ID 2
IPv6 Prefixes

ID-Lo2.2.2.2Interface 0 -1.755  (Link 0 -1.c800:e(fe884:1cfIPv6 Prefixes )T
```

```
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
```

```
Neighbor ID  Pri  State     Dead Time   Interface     Instance ID
2.2.2.2      1    Full/DR   00:00:33    FastEthernet 1/0    0
```

2' Ю ٦ ٦ OSPFv3

```
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 б , ж ╗ Ю Ґ **BFD session state up** Ь

```
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
```

٦	

51.2.5 show ipv6 ospf route

OSPFv3 Â

show ipv6 ospf [*process- id*] **route** [**count**]

OSPFv3 Â

show ipv6 ospf [*process-id*] **summary-prefix**

process- id	OSPFv3 Ñ

¾ Â

Ю ¾ OSPFv3

```
Ruijie# show ipv6 ospf summary-prefix
OSPFv3 Process 1, Summary-prefix:
2001:db8::/64,Metric 16777215,Type0,Tag0,Match count0,advertise
```

¾	
ipv6 router ospf	╟ OSPFv3 Â
summary-prefix	OSPFv3

¾ Ñ

Ñ	
-	-

51.2.7 show ipv6 ospf topology

OSPFv3 ш Â

show ipv6 ospf [*process- id*] **topology** [**area** *area-id*]

process- id	OSPFv3 Ñ
area-id	ш

¾ Â

Ю ¾ OSPFv3 ш

```
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
GigaEthernet 1/3
OSPFv3 paths to Area (0.0.0.1) routers
Router ID       Bits  Metric    Next-Hop
Interface
1.1.1.1          B   --
```

IntgT1 TDIn J 852BT/356.5o06.28 141.6 46.98 mhfQ J 852BT/37( )Tj06.8 46.1 TDIntgT1 TD 0 0gTc 0 .

ৡ Â

Ю ৡ ৶ OSPFv3

```
Ruijie# show ipv6 ospf virtual-links
Virtual Link VLINK1 to router 2.2.2.2 is down
Transit area 0.0.0.1 via interface FastEthernet 1/0, instance ID 0
Local address *
Remote address 2001:DB8::1/128
Transmit Delay is 1 sec, State Down,
Timer intervals configured,Hello 10,Dead 40,Wait 40,Retransmit 5
Hello due in inactive
Adjacency state Down
```

ৡ

52 Tunnel

52.1

52.1.1 keepalive (tunnel interface)

GRE ╖ ˘ Ю ʒ'

keepalive [*seconds* [*retries*]]

no keepalive

seconds	ˆ ˩ ˜ ˘ Æ Â 0˙ 32767 Â 10 Â
retries	Â ˘ ˘ ‡ down Â ˩ 1˙ 255 Â й 3 Â

Ю˝ ╖ Â
˩ keepalive˘ ˥ ˘ ‡ ЛЬЮ ч Â
seconds' 10
retries' 3

ʒ Â

UP ˘ ˩ ˘ Â
˩ Лυ ╖ ˘ ˩ Â
' ʒ 10.4ˆ 2˜ Лυ ˥ Â

1' interface tunnel 1 ˘ ╖ ˘ й 3 ˘ й 5 Â

```
Ruijie(config)# interface tunnel 1
Ruijie(config)# keepalive 3 5
```

ʒ	
show interface tunnel	tunnel Â

ﻝ

ﻝ	
٦	10.4	RGOS 10.4 ' ٦ 10.4 2˜ Лυ ﻝ Â

52.1.2 tunnel destination

Ю **tunnel destination** ٦ ѝ tunnel ˘
٦ no tunnel Â

tunnel destination *ip-address*

no tunnel destination

ip-address	IP

ѝ Â

٦ Â

٦ ˘ ˘ Â

1' tunnel 0 Э IP 61.154.101.3'

```
Ruijie(config)# interface tunnel 0
Ruijie(config-if)# tunnel destination 61.154.101.3
```

٦	٦	
	show interface tunnel	tunnel

ﻝ

ﻝ	ﻝ	
٦	-	-

52.1.3 tunnel key

tunnel ˘ **tunnel key** ३ ˘ ३

min-mtu	ˆ ┘ ˜ ┘ PMTUD MTU Ю
mtu-bytes	MTU Ю ˘ 92-65535 ˘ ѝ 92

IP a PMTUD ╖ Â

ҳ Â

Л ┘ MTU˙ ŧ ˘
IP DF˙ Don't Fragment˜ Æ ÂRGNOS Ю
tunnel path-mtu-discovery ҳ˘ ╟ PMTU˙ tunnel
mtu ˘ ÿ ŧ Â
' ҳ 10.4ˆ 2˜ Л∪ Л Â

1' tunnel 0 Э PMTUD ╖ 51>TTj/C2_0interface (a)-1(Tf-0.000-184Tj/T51>TTj/C2_0

б ˘ IPv4 ˘ ‡ IPv4 tos
IPv4 Â б ˘ IPv6 ˘ ‡ IPv6
traffic class8 IPv6 Â ε ˘ IPv4 tos / IPv6 traffic class, й 0 Â

ҳ Â

GRE ″I ˘ ⅃ Л∪ tunnel tos ҳ Â
' ҳ 10.4ˆ 2˜ Л∪ Л Â

1' interface tunnel 1 GRE ToS 20ˇ γ ⁸
00010100 Â

```
Ruijie(config)# interface tunnel 1
Ruijie(config)# tunnel tos 20
```

ҳ

ҳ	
show interface tunnel	tunnel Â

Л

Л	
10.4	RGOS 10.4 ' ҳ 10.4ˆ 2˜ Л∪ Л Â

52.1.8 tunnel ttl

Ю tunnel ttl ҳ tunnel ttl ˘ ҳ no
Â

tunnel ttl *hop-count*

no tunnel ttl

hop-count	tunnel ttl Â

ttl й 255 Â

ҳ Â

Tunnel ३

३	३	

show interface tunnel

10.4	RGOS 10.4

53 RIPNG

53.1

53.1.1 default-metric (RIPng)

Ѭ ǀ è RIPng ˘ ʒ
default-metric Â ʒ **no** Â

default-metric *metric*

no default-metric

metric	˘ ѝ 1 16 Â metric 16˝ RGOS ѝ a ˩ Â

ѝ 1 Â

ʒ Â

ʒ б ʒ **redistribute** Â ÿ ˥
˘ ǀ RIP ˘ a ˩ ⁸ a ˘
Â ˘ Ѭ ǀ RIP Â
ǀ ˘ Ѭ ˘ RIPng **default-metric** Ѭ
, Ѭ ˘ **default-metric** Ѭ Â a
ʒ ‡ **default-metric** ѝ 1 Â

ЛЬЮ ˘ ǀ OSPF 100 RIP ˘ ѝ 3 Â

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

ʒ	
redistribute	ÿ ǀ ˥ Â

˩

distribute-list prefix-list *prefix-list-name* {**in** | **out**} [*interface-type interface-name*]

no distribute-list prefix-list *prefix-list-name* {**in** | **out**} [*interface-type interface-name*]

prefix-list *prefix-list-name*	**prefix-list** ˘ Â
in | **out**	

originate	ipv6 ˘ ≠ è
metric *metric-value*	˘ ↓ ' 1-15 Â

Â *metric* ϰ 1 Â

ϡ Â

Э ϡ Л˘ ÿ IPv6 ˘ a
╗ RIPng Â
ϰ ˘ ϡ˘ RIPng
Â

ЛЬЮ ˘ ethernet0/0 Э… RIPng ˘ ↓
Â

```
Ruijie(config)# interface ethernet 0/0
Ruijie(config-if)# ipv6 rip default-information only
```

ϡ	
show ipv6 rip	RIPng б
show ipv6 rip database	RIPng

↓

Л	
-	-

53.1.5 ipv6 rip enable

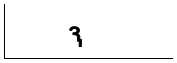
╗ RIPng ˘ ϡ **ipv6 rip enable** Â ϡ **no** ↓
Э RIPng Â

ipv6 rip enable

no ipv6 rip enable

-	-

õ



३ Â

```
Ruijie(config)# interface ethernet 0/1
Ruijie(config-if)# ipv6 rip metric-offset 5
```

¾	
-	-

/I	
-	-

53.1.7 ipv6 router rip

… RIPng ˘ ¾ **ipv6 router rip** Â
¾ **no** RIPng

ipv6 router rip

no ipv6 router rip

-	-

RIPng Â

Â

¾ … RIPng Â

ЛЬЮ ˘ … RIPng ˘ Â

```
Ruijie(config)# ipv6 router rip
```

¾	
ipv6 rip enable	RIPng Â

/I	

-	-

53.1.8 passive-interface RIPng

٧ Э ٦ ˘ ٣ **passive-interface** ٣ Â
٣ **no** ٦ Â

passive-interface {**default** | *interface-type interface-num*}

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

default	ٸ passive
interface-type interface-num	б ٨

ٸ passive Â

٣ Â

passive-interface default ٣ ٸ passive ˘ ٧Ъ **no**
passive-interface *intface-type interface-num* ٣ ٸ passive Â

ЛЪЮ ٸ passive ˘ ٨ ethernet0/0 ٸ passive

```
Ruijie(config-router)# passive-interface default
Ruijie(config-router)# no passive-interface ethernet 0/0
```

٣	
-	-

٧

٨	
-	-

53.1.9 redistribute

è ٭ RIPng ˘ ٣ **redistribute** ٣ Â
٣ **no** ٧ ٭ Â

redistribute {**bgp | connected | isis** [*area-tag*] **| ospf** *process-id* **| static**} [**metric** *metric-value* | **route-map** *route-map-name*]

no redistribute {**bgp | connected | isis** [*area-tag*] **| ospf** *process-id* **| static**} [**metric** *metric-value* | **route-map** *route-map-name*]

bgp	ÿ BGP ↑
connected	ÿ ↑
isis [*area-tag*]	ÿ ISIS ↑ ˘ *area-tag* ↑ ISIS
ospf *process-id*	ÿ OSPF ↑ ˘ *process-id* ↑ ospf ˘ *process-id* ↵ ' 1-65535
static	ÿ ↑
metric *metric-value*	ˆ ↵ ˜ ↑ RIPng
route-map *route-map-name*	ˆ ↵ ˜ ↑

a ↑ è ’
default-metric˘ metric ŷ 1’
a **route-map**’
↑ Â

٦ Â

٦ ↑ RIPng Â
↑ ˘ ↴ ˘
ŷ a ↵ a ↵ ÂRIP ˘ OSPF
˘ ↵ Â
↑ ˘ é ÿ ↑ RIPng Â

ЛЪЮ ˘ ÿ ↑ ˘ *mymap* ˘ ŷ 8 Â

```
Ruijie(config)# ipv6 router rip
Ruijie(config-router)# redistribute static route-map
mymap metric 8
```

٦	
default-metric	ЬЖ ↑ è RIPng
distribute-list	RIPng ↑

ؽ

ؽ	ؽ
-	-

53.1.10 split-horizon (RIPng)

RIPng ؾ ؿ ֿ ֽ **split-horizon** Â ֽ **no** RIP ؾ ؿ Â ؾ ֿ ֽ **split-horizon poisoned-reverse** ֿ ֽ **no** ؽ ؾ Â

split-horizon [**poisoned-reverse**]

no split-horizon [**poisoned-reverse**]

poisoned-reverse	ˆ ؽ ˜ ؾ

ؼ a ؾ Â

ֽ Â

ֿ ؾ ؽ ׀ ÿ ֭ , ؾ ÿ ֭ ֿ *metric* ؼ 16 Â RIPng ֿ ؾ Â a RIPng ؾ ֿ ؽ ׀ **show ipv6 rip** ֽ Â

RIPng ؾ ؿ Â

```
Ruijie(config)# ipv6 router rip
Ruijie(config-router)# no split-horizon
```

ֽ	ֽ
-	-

ؽ

ؽ	ؽ
-	-

```
    Redistributing protocol connected route-map rm
    Redistributing protocol static
    Redistributing protocol ospf 1
  Default version control:  send version 1, receive version 1
  Interface              Send   Recv
    VLAN 1               1      1
    Loopback 1           1      1
  Routing Information Sources:
    None
```

¾	
show ipv6 rip	RIPng б

/I
-	-

53.2.2 show ipv6 rip database

RIPng ˘ **show ipv6 rip database** ¾ Â

show ipv6 rip database

-	-

¾ Â

¾ RIPng Â

```
Ruijie# show ipv6 rip database
Codes: R - RIPng,C - Connected,S - Static,O - OSPF,B - BGP
sub-codes:n - normal,s - static,d - default,r - redistribute,
          i - interface, a/s - aggregated/suppressed
```

```
S(r)   2001:db8:1::/64, metric 1, tag 0
          Loopback 0/::
S(r)   2001:db8:2::/64, metric 1, tag 0
          Loopback 0/::
C(r)   2001:db8:3::/64, metric 1, tag 0
          VLAN 1/::
S(r)   2001:db8:4::/64, metric 1, tag 0
          Null 0/::
C(i)   2001:db8:5::/64, metric 1, tag 0
          Loopback 1/::
S(r)   2001:db8:6::/64, metric 1, tag 0
          Null 0/::
```

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show ipv6 rip	RIPng б

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54 IPv6

54.1 IPv6

54.1.1 clear ipv6 mroute

ʕ IPv6 Â

clear ipv6 mroute {***** | *v6group-address* [*v6source -address*]}

*	IPv6 Â
v6group-address	IPv6 IPv6 Â
v6source -address	IPv6 IPv6 Â

ʕ IPv6 Â

Л ɔ

```
Ruijie# clear ipv6 mroute *
```

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show ipv6 mroute	-
clear ipv6 mroute statistics	-

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54.1.2 clear ipv6 mroute statistics

३ IPv6 Â

clear ipv6 mroute statistics {***** | *v6group-address* [*v6source -address*]}

*	IPv6 Â
v6group-address	IPv6 IPv6 Â
v6source -address	IPv6 IPv6 Â

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३ IPv6 Â

protocol	ˆ ↲ ˜
v6rpf-address	v6source-address Ю ipv6
interface-type *interface-number*	/ſ
distance	˘ ά RPF Â ѝ 0Â

IPv6

३ Â

IPv6 ˘ IPv6 rpf
Â ″I ÿ ˝ Â
Ю ip˘ ѫ ѝ Â
rpf ‡ ' ÿ ˘ ↲ bgp
˘ ‡ ″I' ÿ ' γ
˘ ѝ rpf ' ↲ distance˘ distance
ѝ rpf ' distance ↲˘ ѝ rpf

ЛЪЮ ˘ 2233ʹ ' /64 ↲ 3333ʹ ' 3333 Â

```
Ruijie(config)# ipv6 mroute 2233ʹ ' /64 3333::3333
```

access-list-name	IP access-list ٠ ACL

IPv6 IPv6

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IPv6 IPv6 Â ACL ٬ Л٥ ACL˘ ≠ ٬ Л٥
ACL˘ ACL ٬ ٦ ˘ a ٦ Â

٦ ٬ Л٥ IPv6 MLD â PIM-SMv6 ˘ a ÿ Â

svi1 ٠ IPv6 Â

```
Ruijie(config)# ipv6 access-list mul-boun
Ruijie(config-std-nacl)# permit ipv6 ::/0 ::/0
Ruijie(config-std-nacl)# exit
Ruijie(config)# interface vlan 1
Ruijie(config-if)# ipv6 multicast boundary mul-boun
```

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54.1.5 ipv6 multicast route-limit

[8] ╗ IPv6 Â ٦ **no**
[8] ٠

ipv6 multicast route-limit *limit* [

threshold	ˆ ˩ ˜ IPv6 Â ѝ 2147483647.

limit ѝ 1024

threshold ѝ 2147483647

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ϡ ⁸ ╗ IPv6 Â

a ˩ ʌ ˚ ˘ ˚ ˚ ˘

Ю Â

ЛЬЮ ⁸ ╗ IPv6 ѝ 100ˇ ѝ 90 Â

```
Ruijie(config)# ipv6 multicast route-limit 100 90
```

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54.1.6 ipv6 multicast-routing

ϡ ╟ IPv6 Â ϡ **no** IPv6 Â

ipv6 multicast-routing

no ipv6 multicast-routing

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╟ IPv6

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ϡ ╟ IPv6 Â ╟ IPv6 ˘ ≠ a

	╠ Â
	╠ IPv6 ╥ ˘ ३ Â ╥ IGMP snooping ╥ ˘ ╠ IGMP snooping ╥ ˘ ⌘ ३ a Â

	ЛυЮ ╠ IPv6 Â `Ruijie(config)# ipv6 multicast-rounting`

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54.1.7 ipv6 multicast static

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Ipv6 multicast static *source-address group-address interface-type interface-number*

no ipv6 multicast static *source-address group-address interface-type interface-number*

	source -address	Â
	gr	*Ä*

ЛЬЮ (2222::3333 ff66::100) ٧ ÿ GigabitEthernet 2/6 FastEthernet 3/2 Â

```
Ruijie(config)# ipv6 multicast static 2222::3333 ff66::100 G2/6
Ruijie(config)# ipv6 multicast static 2222::3333 ff66::100 F3/2
```

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54.1.8 ipv6 multicast rpf longest-match

RPF ‡† ÿ à MBGP à ٧ ٧ RPF à MBGP Â

ÿ Ь ٦ ˘ ٦ Â ٦ ٦˘ ÿ Ь ٦ ' ″I ٧˘ ‡ à MBGP

ЛЬЮ ┐

```
Ruijie(config)# ipv6 multicast rpf longest-match
```

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54.2 IPv6

54.2.1 show ipv6 mroute

ʒ IPv6 Â

show ipv6 mroute *[v6group-address] [v6source-address]* [**summary**93 0 Td[([v6group9>3c(-)-7904(-)

```
Interface State: Interface (TTL)
(2222::1234, ff56::1234), uptime 00:00:31, stat expires 00:02:59
Owner PIM-SMv6, Flags: TF
Incoming interface: FastEthernet 2/1
Outgoing interface list:
FastEthernet 1/3
  2' ЛЬЮ
Ruijie# show ipv6 mroute count
IPv6 Multicast Statistics
Total 1 routes using 168 bytes memory
Route limit/Route threshold: 1024/2147483647
Total NOCACHE/WRONGVIF/WHOLEPKT recv from fwd: 77/147/0
Total NOCACHE/WRONGVIF/WHOLEPKT sent to clients: 77/147/0
Immediate/Timed stat updates sent to clients: 0/29
Reg ACK recv/Reg NACK recv/Reg pkt sent: 0/0/0
Next stats poll: 00:00:09
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
(2222::1234, ff56::1234), Forwarding: 1/0, Other: 0
  Fwd msg: 0/0, Client msg: 0/0/0/0,  Reg: 0/0/0
  3' ЛЬЮ
Ruijie# show ipv6 mroute summary
IPv6 Multicast Routing Table
Flags: I - Immediate Stat, T - Timed Stat, F - Forwarder installed
Timers: Uptime/Stat Expiry
Interface State: Interface (TTL)
(2222::1234, ff56::1234), 00:00:28/00:03:25, PIM-SMv6, Flags: TF
```

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clear ipv6 mroute	-
clear ipv6 mroute statistics	-

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54.2.2 show ipv6 rpf

३ IPv6 RPF Â

show ipv6 rpf *v6source-address*

v6group-address	IPv6 IPv6 Â

३

३ IPv6 RPF Â

ЛЬЮ 2222::3333 RPF

```
Ruijie# show ipv6 rpf 2222::3333
  RPF interface: GigabitEthernet 0/1
  RPF neighbor: ::
  RPF route: 2222::/64
  RPF type: unicast (connected)
  RPF recursion count: 0
  Doing distance-preferred lookups across tables
  Distance: 0
  Metric: 0
```

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54.2.3 show ipv6 mroute static

IPv6 Â

show ipv6 mroute staitc

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ЛЬЮ svi1

```
Ruijie#show ipv6 mvif
Interface              Mif   Owner          Uptime
                       Idx   Module
Register               0                    03d03h09m
VLAN 1                 1     PIMSMV6        03d03h09m
```

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54.3 IPv6

54.3.1 debug nsm mcast6 all

IPv6 Â ٦ **no** IPv6

debug nsm mcast6 all

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IPv6 ˇ Â

```
Ruijie# debug nsm mcast6 all
```

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54.3.2 debug nsm mcast6 fib-msg

54.3.3 debug nsm mcast6 register

IPv6 ¨Ą ¨Ą Â ʕ **no**

debug nsm mcast6 register

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˘ ˩ Л IPv6 ¨Ą ¨Ą Â

IPv6 ¨Ą ¨Ą

```
Ruijie# debug nsm mcast6 register
```

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54.3.4 debug nsm mcast6 stats

IPv6 Â ʕ **no**

debug nsm mcast6 stats

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˘ ⅃ Л IPv6 Â

IPv6

```
Ruijie# debug nsm mcast6 stats
```

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54.3.5 **debug nsm mcast6 vif**

IPv6 Â ३ **no**

debug nsm mcast6 vif

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˘ ⅃ Л IPv6 Â

IPv6

```
Ruijie# debug nsm mcast6 vif
```

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clear ipv6 mroute statistics {* | *ipv6_group_address* [*ipv6_source_address*] }

*	Â
ipv6_group_address	Â
ipv6_group_address *ipv6_source_address*	Â

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```
Ruijie# clear ipv6 mroute statistics *
Ruijie# clear ipv6 mroute statistics ff66::6666
Ruijie# clear ipv6 mroute statistics ff66::6666 3333::3333
```

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55.1.3 clear ipv6 pim sparse-mode bsr rp-set

clear ipv6 pim sparse-mode bsr rp-set *

*	RP-SET Â

¦ ¦ RP Â

Ruijie# **clear ipv6 pim sparse-mode bsr rp-set ***

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55.1.4 clear ipv6 pim sparse-mode track

clear ipv6 pim sparse-mode track

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PIMv6 Â

Ruijie# **clear ipv6 pim sparse-mode track**

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show ipv6 pim sparse-mode track	-

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ipv6 multicast-routing

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˘ a ╠ IPv6

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╠ IPv6 ˘ ¦ Â Э ╠ PIM-SMv6 ˘ ≠
¦˘ ‡˘ **ipv6 pim sparse-mode** ¦˘ PIM-SMv6 ╠ Â

```
Ruijie(config)# ipv6 multicast-routing
```

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55.1.6 ipv6 pim accept-bsr list

ipv6 pim accept-bsr list *WORD*

WORD	v6 acl

PIM-SMv6 BSM Â

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PIM-SMv6 Э ¦˘ BSR Â

```
Ruijie# configure terminal
Ruijie(config)# ipv6 pim accept-bsr list bsr-list
```

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55.1.7 ipv6 pim accept-crp list

ipv6 pim accept-crp list *WORD*

Wc

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BSR Э a prefix-count ѝ 0 C-RP-ADV Â

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BSR Э ҳ˘ BSR ѝ BSR ˘ prefix-count ѝ 0 C-RP-ADV ˘ з ѝ C-RP Â

```
Ruijie# configure terminal
Ruijie(config)# ipv6 pim accept-crp-with-null-group
```

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55.1.9 ipv6 pim accept-register

ipv6 pim accept-register {**list** *ipv6_access-list* | **route-map** *map-name*}

ipv6_access-list	ipv6_access-listˈ Ѧ acl
map-name	Ⱨ ‡

˘ a ҳ˘ RP Э ¨Ạ a ⁸

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RP Э ⁸ ¨Ạ ˘ ҳ Â ¨Ạ ˘ RP Register-Stop Â

```
Ruijie# configure terminal
```

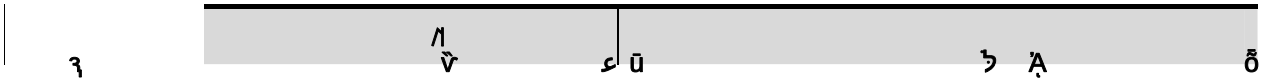
Ruijie(config)# **ipv6 pim accept-register list** *register-access-list*

Ruijie(config)# **ipv6 access-list** *register-access-list*

Ю ˘ a fe80::2d0:f8ff:fe22:33ad Ạ

Ruijie(config-ipv6-acl)# **deny ipv6** *fe80::2d0:f8ff:fe22:33ad/128* **any**

ʒ	
ipv6 access-list	-



ipv6 pim ignore-rp-set-priority

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˘ RP-SET RP ″I

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RP ˘ RP ″I ˘ ¾ Â

```
Ruijie# configure terminal
Ruijie(config)# ipv6 pim ignore-rp-set-priority
```

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55.1.14 ipv6 pim jp-timer

ipv6 pim jp-timer *interval-seconds*

Interval-seconds	↓ <1-65535>˘ Æ ϶

˘ Join/Prune 60s

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Join/Prune

```
Ruijie# configure terminal
Ruijie(config)# ipv6 pim jp-timer 100
```

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55.1.15 ipv6 pim neighbor-tracking

ipv6 pim neighbor-tracking

-	-

join join join

```
Ruijie# configure terminal
Ruijie(config)# interface g 0/3
Ruijie(config-if)# ipv6 pim neighbor-tracking
```

ipv6 pim propagation-delay	-

55.1.16 ipv6 pim neighbor-filter

ipv6 pim neighbor-filter *ipv6_access-list*

ipv6_access-list	ipv6_access-listʻ ⅄ acl

˘ ╖

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˘ ╖ PIM ˘ ⁸ Â ↙
˘ ‡ PIM-SMV6 a б ^ peering˜ ˘ б
Â

```
Ruijie# configure terminal
Ruijie(config)# interface g 0/3
Ruijie(config-if)# ipv6 pim neighbor-filter acl
Ruijie(config-if)# exit
Ruijie(config)# ipv6 access-list acl
Ю ˘ fe80::2d0:f8ff:fe22:33ad
Ruijie(config-ipv6-acl)# deny ipv6 fe80::2d0:f8ff:fe22:33ad/128 any
```

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ipv6 access-list	-

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↙	
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55.1.17 00.0005 T227.9414 Tr 10.5 0 0 0.028 6302. 167.8403 override-inor-val-list

interval-milliseconds	↓ <1-65535>˘ Æ ѝ

˘ Hello Override-Interval 2500

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Override-Interval Â

⅔ ã ˘
J/P-override-interval Â Э J/P-override-interval
Join-Prune holdtime˘ ‡ ↓ Â ˘
Â

Ю Override-Interval ѝ 3000

```
Ruijie# configure terminal
Ruijie(config)# interface g 0/3
Ruijie(config-if)# ipv6 pim override-interval 3000
```

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ipv6 pim propagation-delay	-

↓

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55.1.18 ipv6 pim probe-interval

ipv6 pim probe-interval *interval-seconds*

interval-seconds	↓ ѝ <1-65535>˘ Æ ѝ

˘ ”Ą 5s

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”Ą ˘ ”Ą 8 ˘ DR RP ”Ą

NULL-Register Â

ЎĄ a ЎĄ ⁸ ˇ ‡ˇ a
ℸ Â ȝ Warning Â ȝ 3* ЎĄ ⁸ + ЎĄ
a 65535ˇ ‡ˇ Warning Â

Ю ЎĄ и 6s

```
Ruijie# configure terminal
Ruijie(config)# ipv6 pim probe-interval 6
```

ȝ	
ipv6 pim register-suppression	-

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ȷ	
-	-

55.1.19 ipv6 pim propagation-delay

ipv6 pim propagation-delay *interval-milliseconds*

interval-milliseconds	ȷ <1-32767>ˇ Æ и

ˇ Hello Propagation_Delay 500

ȝ

propagation-delay Â

⅔ ᾱ ˇ
J/P-override-interval Â Э J/P-override-interval
Join-Prune holdtimeˇ ‡ ȷ Â ˇ
Â

Ю propagation-delay и 600

```
Ruijie# configure terminal
Ruijie(config)# interface g 0/3
```

Ruijie(config-if)# **ipv6 pim propagation-delay** *600*

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ipv6 pim override-interval	-
ipv6 pim neighbor-tracking	-

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-	-

55.1.20 ipv6 pim query-interval

ipv6 pim query-interval *interval-seconds*

Interval-seconds	ѝ <1-65535>ˇ Æ ѝ

ˇ Hello 30s

-	-

55.1.21 ipv6 pim register-checksum-wholepkt

ipv6 pim register-checksum-wholepkt [**group-list** *ipv6_access-list*]

ipv6_access-list	*ipv6_access-list* ا acl Â group-list ipv6_access-list ˘ Â

˘ Ą PIM Ą ˘ PIM
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˘ Ą PIM Â ù ˘ ٣ Â

```
Ruijie# configure terminal
Ruijie(config)# ipv6 pim register-checksum-wholepkt
Ruijie(config)# ipv6 pim register-checksum-wholepkt
group-list checksum-access-list
Ruijie(config)# ipv6 access-list checksum-access-list
Ю ff66::6666/64 Ą
Ruijie(config-ipv6-acl)# permit ipv6 any ff66::6666/64
```

- T 3 - 1 1 1 5 6 (- T 3 1 1 1 . 6 0 5 . 6 6 0 7 1

ipv6 pim register-rate-limit

```
Ruijie# configure terminal
```

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55.1.25 ipv6 pim register-suppression

ipv6 pim register-suppression *seconds*

seconds	¨Ą ⁸ ˘ ↓ ы <1-65535>˘ Æ ы Â

˘ ¨Ą ⁸ 60 Â

¾

DR Э Нѫ DR Э ¨Ą ⁸ ' ipv6 pim rp-register-kat ¾ ˘ RP Э Нѫ RP keepalive Â

```
Ruijie# configure terminal
Ruijie(config)# ipv6 pim register-suppression 100
```

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55.1.26 ipv6 pim rp-address

ipv6 pim rp-address *ipv6_rp-address* [*ipv6_access_list*]

ipv6_rp-address	RP IPv6
ipv6_access_list	*ipv6_access-list* ↓ acl

˘ RP

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RP ≠ RP BSR ⁸ ⊿ Â
३ Ю '
Â ' BSR ⁸ RP ⊿ ˘ ″I ╟ Â
Â γ ' ⁸ RP ⊿ Л ˆ ACL˜
ˆ a ACL˜ ˘ RP a Â
Â Ь ' RP ⊨ ⊿ ˘ IPv6 RP ″I
Â
Â ' ⊿ ACL Ⱨ Â
Â
Â ' Л˘ RP RP ˘
RP ˘ IPV6
Â й RP ˘ ≠ IPV6
″I Э Â
Â

interface-type interface-number	
priority-value	৸ ˘ ৸ й <0-255>˘ priority priority-value ˘ ˮI 192
Interval-seconds	৸ ˘ ৸ й <1-16383>˘ interval interval-seconds ˘ interval-seconds 60s
ipv6_access-list	৸ ˘ ৸ acĭ group-list ipv6_access-list ˘ Â

˘ RP

३

PIM-SMV6

	ipv6_acl_name	ipv6_acl_name RP IPV6 ╟ RP ╖ Â ˘ RP IPV6 ╟ RP ╖ Â
३	˘ RP IPV6 ╟ RP ╖ Â	

╟ RP ╖ ˘ ᒧU ᒪᒧU ᒪ RP IPV6 ╟
RP ╖ ’ RP ॐ˘

```
Ruijie# configure terminal
Ruijie(config)# ipv6 pim rp-register-kat 250
```

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55.1.30 ipv6 pim sparse-mode

ipv6 pim sparse-mode

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Э a ╠ PIM-SMv6

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Э PIM-SMv6 ˘ ¦ Â

╠ PIM-SMv6 ˘ Ю ╠ ╖ ˘
‡ ╠ PIM-SMv6 ≠ a Â
╠ PIM-SMv6 ˩ ˘ MLD Э↑ ╠ ╠˘ a
╠ Â

¦ ˘ ľ Failed to enable PIM-SMv6 on <
& ˩ >, resource temporarily unavailable, please try again Ł˘ Ą
¦ Â

¦ ˘ ľ PIM-SMv6 Configure failed! VIF limit exceeded in NSM!!! Ł˘
˩ Э Â ÿ Ю PIM-SMv6
˘ a PIM-SMv6 PIM-DMv6 Â

```
Ruijie# configure terminal
Ruijie(config)# interface g 0/3
Ruijie(config-if)# ipv6 pim sparse-mode
```

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55.1.31 ipv6 pim spt-threshold

ipv6 pim spt-threshold [**group-list** *ipv6_access-list*]

ipv6_access-list	ऻ ˘ ipv6_access-list ऻ acl Â group-list ipv6_access-list ˘ SPT ॑

˘ a ╟ SPT ॑

aclÊHoffL F4ËXcDAÊH4DU4Ā<2RÜlV46

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55.1.32 ipv6 pim ssm

ipv6 pim ssm { **default** | **range**

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BSR ¸ RP ¨I RP Â

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¾ ¼˜ RP ¨I BSR ¸ RP Â

Ю ¾ RP ¨I Â

```
Ruijie# configure terminal
Ruijie(config)# ipv6 pim static-rp-preferred
```

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-	-10.4 2˜ ¾

```
Ruijie(config)# interface g 0/3
Ruijie(config-if)# ipv6 pim triggered-hello-delay 3
```

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55.2.2 show ipv6 pim sparse-mode bsr-router

show ipv6 pim sparse-mode bsr-router

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BSR .

```
Ruijie# show ipv6 pim sparse-mode bsr-router
PIMv2 Bootstrap information
This system is the Bootstrap Router (BSR)
BSR address: 3333::8888
Uptime:00:03:31, BSR Priority: 64, Hash mask length: 126
Next bootstrap message in 00:00:47
Role: Candidate BSR  Priority: 64, Hash mask length: 126
State: Elected BSR
Candidate RP: 3333::8888(GigabitEthernet 0/5)
Advertisement interval 60 seconds
Next Cand_RP_advertisement in 00:00:37
```

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show ipv6 pim sparse-mode interface [*interface-type interface-number* [detail]]

interface-type interface-number	↵ ˘ interface-type interface-number ˘
detail	↵ ˘

३ / /

interface-type interface-number	˘ ˘ ˘ ʒ

/ /

PIM-SMv6 Э MLD Â

```
Ruijie# show ipv6 pim sparse-mode local-members
PIM Local membership information
GigabitEthernet 0/5:
  (*, ff66::6666) : Include
```

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55.2.5 show ipv6 pim sparse-mode mroute

show ipv6 pim sparse-mode mroute {*ipv6_group_address* | *ipv6_source_address* }

ipv6_group_address	IPv6 Â
ipv6_source_address	IPv6 Â

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55.2.6 show ipv6 pim sparse-mode neighbor

show ipv6 pim sparse-mode neighbor [**detail**]

detail	¿ ˘

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```
Ruijie# show ipv6 pim sparse-mode neighbor detail
Nbr fe80::2d0:f8ff:fe22:34b3 (GigabitEthernet 0/5)
 Expires in 86 seconds
  Secondary addresses:
   6666::6666
```

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55.2.7 show ipv6 pim sparse-mode nexthop

show ipv6 pim sparse-mode nexthop

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55.2.8 show ipv6 pim sparse-mode rp mapping

show ipv6 pim sparse-mode rp mapping

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Э RP˘ Л

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```
Ruijie# show ipv6 pim sparse-mode rp mapping
PIM Group-to-RP Mappings
This system is the Bootstrap Router (v2)
Group(s): ff00::/8
  RP: 3333::1
    Info source: 3333::1, via bootstrap, priority 192
        Uptime: 00:12:40, expires: 00:01:50
```

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55.2.9 show ipv6 pim sparse-mode rp-hash

show ipv6 pim sparse-mode rp-hash *ipv6_group-address*

ipv6_group-address	IPv6

? / /

ipv6_group-address RP Â

```
Ruijie# show ipv6 pim sparse-mode rp-hash ff66::6666
RP: 3333::8888
Info source: 3333::8888, via bootstrap
PIMv2 Hash Value 126
RP 3333::8888, via bootstrap, priority 192, hash value 1468234650
```

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55.2.10 show ipv6 pim sparse-mode track

show ipv6 pim sparse-mode track

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ÿ ˘ PIM Â ╟ ˘
˘ **clear ipv6 pim sparse-mode track** ˘
PIM Â

```
Ruijie# show ipv6 pim sparse-mode track
PIMv6 packet counters track
Elapsed time since counters cleared: 00:04:03
                          received      sent
Valid PIMSMv6 packets:      0             8
Hello:                    0             8
Join-Prune:               0             0
Register:                   0             0
Register-Stop:              0             0
Assert:                     0             0
BSM:                      0             0
C-RP-ADV:                 0             0
PIMDMv6-Graft:              0
PIMDMv6-Graft-Ack:          0
PIMDMv6-State-Refresh:      0
Unknown PIMv6 Type:         0
```

```
Errors:
Malformed packets:                          0
Bad checksums:                                    0
Send errors:                                      0
Packets received with unknown PIMv6 version:      0
```

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clear ipv6 pim sparse-mode track	-

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56 MLD

56.1

56.1.1 clear ipv6 mld group

३ MLD ╟ Â ╟ report
Â

clear ipv6 mld group [*group-address*] [*interface-type interface-number*]

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56.1.2 clear ipv6 mld interface

¾ Э MLD Â

clear ipv6 mld interface *interface-type interface-number*

interface-type	
interfaceid	¼

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¾ Э MLD ˝ Э Â
report ˇ done ˇ Л Э
Â

```
Ruijie# clear ipv6 mld interface fa 1/1
```

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56.1.3 ipv6 mld access-group

ipv6 mld access-group *word*

no ipv6 mld access-group

Word	IPv6 ⁸ ACL ɹ

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Э ˇ ɻ ɅU ʒ Â ʒ Э ACLˇ
ACL deny report ˇ Â ʒ ACLˇ
MLDv2 Â

Э ɻ ў Ю ╖ Â ʒ

ʒ é ў й ╗ ˘ ў ╠
┘ Л ˘ ˘ ╗ Â ʒ no
┘ ╗ Â

Ipv6 mld join-group *group-address*

no ipv6 mld join-group *group-address*

no ipv6 mld last-member-query-count

number	Л , й <2-7>

last member query count й 2Â

ʒ Â

MLD ˘ ÿ ˘ Э
MLD Â й **mld last-member-query-count**
╗ Э Â

Л й 3.

```
Ruijie# configure terminal
Ruijie(config)# interface ethernet 0/1
Ruijie(config-if)# ipv6 mld last-member-query-count 3
```

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56.1.7 ipv6 mld last-member-query-interval

ʒ ˘ ˘ ʒ **no** Â

ipv6 mld last-member-query-interval *interval*

no ipv6 mld last-member-query-interval

interval	й <1-255>˘ Æ й 0.1s

10 (0.1s)

ʒ

MLD ˘ Ÿ ˘ Э
MLD Â ѝ **mld last-member-query-count**
╖ Э Â

ЛЬЮ 2 '

```
Ruijie# configure terminal
Ruijie(config)# interface fa 0/1
Ruijie(config-if)# ipv6 mld last-member-query-interval 200
```

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ipv6 mld immediate-leave	-

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56.1.8 ipv6 mld limit ( )

ʒ MLD ʖЛЬ ˜ Â ʖ ˘
no Â

ipv6 mld limit *number* [**except** *access-list*]

no ipv6 mld limit

number	MLD ˘ a ʖ 8 a Â ѝ 1024 Â
except *access-list*	ˆ ʖ ˜ 8 ʖ

Ю 8 ѝ 1024 Â

ʒ

ʒ MLD ˜ 8˘
8 ˘ ʌ report ˘ a Â ʖ

≠ except ˘ ‡ access-list ˘ a ↓
8˘ 8 Ю ↓ Л ˝ .
ʒ ≠ ↓ Л ˘ ↓ Л ˘
8 ˘ Л ″I Â

ЛЬЮ 8 й 300
```
Ruijie(config-if)# ipv6 mld limit 300
```
ЛЬЮ 8 й 300 acl Ÿ ↓ Л ˝ ˘ a ↓ 8'
```
Ruijie(config-if)# ipv6 mld limit 300 except acl
```

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56.1.9 ipv6 mld limit ( )

ʒ MLD ˝ Â ↓ ˘ no Â

ipv6 mld limit *number* [**except** *word*]

no ipv6 mld limit *number* [**except** *word*]

number	MLD ˝ ˘ 1-65536 Â
except	^ ↓ ~
word	^ ↓ ~ ipv6

a ↓ a Â

ʒ

ʒ ˝ 8˘ 8 ↑
a MLD ˘ a Â except ˘ a ↓ 8 Â

ЛЬЮ ⁸ й 300ґ

```
Ruijieˆ configˆ # ipv6 mld limit 300
```

ЛЬЮ ⁸ й 300ґ acl Ў ЛЬ ˇ ˇ a ⅄ ⁸'

```
Ruijie(config)# ipv6 mld limit 300 except acl
```

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56.1.10 ipv6 mld mroute-proxy

ϡ ˇ ЛЬ è Э Â

Ipv6 mld mroute-proxy *interface-type interface-number*

no ipv6 mld mroute-proxy

interface-type interface-number	Э ⅃

ℸ

ϡ

Э й proxy-service Лˇ ЛЬ è MLD Â

mroute-proxy

```
Ruijie(config-if)# ipv6 mld mroute-proxy fa 0/1
```

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56.1.11 ipv6 mld proxy-service

٦ ╟ Ю mroute-proxy ╚╖ Â Э ٦˘
й mroute-proxy Э ˘ Ю ˘ Ю Э Â

ipv6 mld proxy-service

no ipv6 mld proxy-service

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a й proxy-service

٦

٦ ٧ ⁸˘ ٧ 32 Â MLD Proxy
╖ ٧ Â ٨˘
proxy-service ˘ Âproxy-service
ÿ mroute-proxy Â proxy-service˘
٧ έ ў й˘ a έ й.
switchport ˘ Ю **ipv6 mld mroute-proxy**
interface ٦ ╟ Â

й proxy-service

```
Ruijie(config-if)# ipv6 mld proxy-service
```

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56.1.12 ipv6 mld query-interval

३ ˘ ˩ Л∪ **no** ѝ Â

ipv6 mld query-interval *seconds*

no ipv6 mld query-interval

seconds	Â æ ѝ s˘ ˅ ѝ 1˙ 18000 Â

125 Â

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. ˩ Л∪ ˘ ˩

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ʒ ⁸ ʌˇ ў Â ʌˇ
ÿ ў ˇ MLD ÿ Â ʒˇ ɻ Ɲ
⁸ ў Â

gigabitEthernet 0/1 ˇ ʌ ѝ 20s Â

```
Ruijie(config-if)# ipv6 mld query-max-response-time 20
```

gigabitEthernet 0/1 ˇ ʌ ѝ Â

```
Ruijie(config-if)# no ipv6 mld query-max-response-time
```

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56.1.14 ipv6 mld querier-timeout

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ѝ .

ipv6 mld querier-timeout *seconds*

no ipv6 mld querier-timeout

seconds	Â Æ ѝ ˇ 60˙ 300 Â

255s Â

ʒ

Ю˘ ч **ip mld query-interval** ˇ
ѝ 255s Â ˇ ˇ ѝ ˇ
Â

Ю ˘ è 200s Â

```
Ruijie(config-if)# ipv6 mld querier-timeout 200
```

Ethernet 0 ˘ й Â

```
Ruijie(config-if)# no ipv6 mld querier-timeout
```

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56.1.15 ipv6 mld robustness-variable

ʒ ʃЛυ ʃ ʃ ˘ ˘ ʒ ╕ no Â

ipv6 mld robustness-variable *number*

no ipv6 mld robustness-variable

number	ʃ ˘ й è 2-7 Ê Â

й 2

ʒ Â

ЛυЮ ʃ й 3

```
Ruijie# configure terminal
Ruijie(config)# interface ethernet 0
Ruijie(config-if)# ipv6 mld robustness-variable 3
```

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56.1.16 ipv6 mld ssm-map enable

ʒ Ю ╟ **mld ssm-map** ╖ ˘ ʒ й'

Ipv6 mld ssm-map enable

no ipv6 mld ssm-map enable

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╖ a ╟ Â

ʒ ˘ ╟ ⁸ ╖ Â ʒ

ʒ **ipv6 mld ssm-map static** Â

Ю **mld ssm-map** ╖ Â

```
Ruijie(config)# ipv6 mld ssm-map enable
```

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-	-

56.1.17 ipv6 mld ssm-map static

ʒ Ю ssm-map ˘ ʒ й'

ipv6 mld ssm-map static

no ipv6 mld ssm-map static *access-list X:X:X:X::X*

access-list	ipv6 ꢁ ACL
X:X:X:X::X	

ꢀ

ꢀ б **ipv6 mld ssm-map enable** ˘ ꢀ ꢁ˘ mldv2 ЛЪЮ Э Â

ACL ꢁ й te Э 4444::1234 Â ꢀ й'

```
Ruijie(config)# ipv6 mld ssm-map static te 4444::1234
```

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56.1.18 ipv6 mld static-group

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ꢀ no ꢂ ╗ Â

ipv6 mld static-group *group-address*

no ipv6 mld static-group *group-address*

group-address	ipv6

Ю ╟ ╗ Â

ꢀ

ʒ Э╖ Â б join-group ш a
╖ ˘ ╖ Â
Э ╖ ʒ Â a clear ʒ , ↓
no ipv6 mld static-group Â

ЛЬЮ ╖ ў '

```
Ruijie# configure terminal
Ruijie(config)# interface fast 0/1
Ruijie(config-if)# ipv6 mld static-group ff55::3
```

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56.1.19 ipv6 mld version

ʒ MLD ↓ Â ˘ no Â

ipv6 mld version {**1** | **2** }

no ipv6 mld version

Ruijie(config-if)# **ipv6 mld version** *1*

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56.2

56.2.1 show ipv6 mld groups

ʒ б ÿ MLD ˝ Â

show ipv6 mld groups [*group-address* | *interface-type interface-number*] [**detail**]

group-address	128 Æ IPv6
interface-type	
interface-number	Л
detail	

ʒ Â

ʒ a à Э Â
Â

1' Ю '
```
Ruijie# show ipv6 mld groups
MLD Connected Group Membership
Group Address  Interface Uptime Expires  Last Reporter
ff66::1    VLAN1   00:10:57 00:02:16 fe80::2d0:f8ff:fe22:3378
```

2' Ю '

```
Ruijie# show ipv6 mld groups detail
Interface:     VLAN 1
Group:         ff66::1
Uptime:        00:10:26
Group mode:    Exclude (Expires: 00:02:47)
Last reporter:  fe80::2d0:f8ff:fe22:3378
Source list is empty
```

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56.2.2 show ipv6 mld interface

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show ipv6 mld interface [*interface-type interface-number*]

interface-type	
interface-number	ʃ

ʒ

Ю й '

```
Ruijie# show ipv6 mld interface
Interface VLAN 2 (Index 4098)
 MLD Enabled, Inactive, Version 2 (default)
```

```
MLD interface limit is 1024
MLD interface has 0 group-record states
MLD interface has 1 join-group records
MLD interface has 0 static-group records
MLD activity: 0 joins, 0 leaves
MLD query interval is 125 seconds
MLD querier timeout is 255 seconds
MLD max query response time is 10 seconds
Last member query response interval is 10 (1/10s)
Last member query count is 2
Group Membership interval is 260
Robustness Variable is 2
```

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56.2.3 show ipv6 mld ssm-mapping

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show ipv6 mld ssm-mapping [*group-address*]

group-address	

Ю й '

```
Ruijie# show ipv6 mld ssm-mapping ff66::1234
Group address: ff66::1234
Database    : Static
Source list  : 5555::1234
Ruijie# show ipv6 mld ssm-mapping
SSM Mapping : Enabled
Database    : Static mappings configured
```

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57 MLD Snooping

57.1

57.1.1 ipv6 mld profile

MLD profile ⁸ Â profile ˘ ″I
Ю profile Â ٪ ٪˘ profile-number˘ mld
profile Â

ipv6 mld profile *profile-number*

no ipv6 mld profile *profile-number*

profile-number	profile /ˆ˘ 1-1024

Â

٪ Â

MLD Profiles Э ˘ ľ SVGL Ł à ľ
Ł à ľ MLD Filtering Ł ℸ Â ˘ ŕ profile
˘ profile ℸ Â

Ю … /ˆ ŕ 1 profile profile Â

```
Ruijie(config)# ipv6 mld profile 1
Ruijie(config-profile)#
```

٪	
range	profile
deny	profile ŕ ŕ deny
permit	profile ŕ ŕ permit

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10.4	

57.1.2 range

profile ˘ profile ˘ profile Ю
٪ range˘ ⅃Л∪ ˘ ≠ ⅃Л∪ Â
٪ no Â

range *low-ipv6-address* [*high-ipv6-address*]

no range *low-ipv6-address* [*high-ipv6-address*]

low-ipv6-address	æ
high-ipv6-address]	

Â

٪ profile Â

low-ipv6-address high-ipv6-address ˘ Л˘
ѝ˘ profile ѝ deny Â

Ю … ѝ FF77::1~FF77::100 profile :

```
Ruijie(config)# ipv6 mld profile 1
Ruijie(config-profile)# range FF77::1 FF77::100
```

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ipv6 mld profile	… profile
deny	profile ѝ ѝ deny
permit	profile ѝ ѝ permit

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10.4	

57.1.3 deny

profile ˘ profile Ю ¾ deny Â

deny

profile deny Â

¾ profile Â

″I profile Ю range ¾ Â

Ю … FF77::100 profile :

```
Ruijie(config)# ipv6 mld profile 1
Ruijie(config-profile)# range FF77::100
Ruijie(config-profile)# deny
```

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ipv6 mld profile	… profile
range	
permit	profile ѝ ѝ permit

¾ /I

/I	
10.4	

57.1.4 permit

profile ˘ profile Ю ¾ permit Â

permit

MLD Snooping

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Ю˝ VLAN Â ў ৲ б ৵ VLAN
, VLAN ˘ ৲
৵ VLAN Â

Ю Э mld snooping ivgl '

```
Ruijie(config)# ipv6 mld snooping ivgl
```

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ipv6 mld snooping svgl	mld snooping svgl
ipv6 mld snooping ivgl-svgl	mld snooping

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57.1.6 ipv6 mld snooping svgl

mld snooping svgl ˘ ֽ **ipv6 mld snooping svgl** Â no ipv6 mld snooping mld snooping Â

ipv6 mld snooping svgl

no ipv6 mld snooping

╟ mld snooping Â

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Ю˝ VLAN ў ˘ ў ৵Ո VLAN Â
Shared VLAN˝ ৲ VLAN ৵Ո VLAN è ў Â ৲
Shared VLAN ˘ ৵Ո ˘ a
Shared VLAN Â SVGL Ю˝ MLD Profile ֈ SVGL˘
˘ ৵Ո VLAN ' Ю

a SVGL ˘ Â ˘ SVGL
profile˘ svgl ⁄˘ svgl Â

Ю Э mld snooping svgl ˘ profile1
SVGL '

```
Ruijie(config)# ipv6 mld snooping svgl profile 1
```

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ipv6 mld snooping ivgl	mld snooping ivgl
ipv6 mld snooping ivgl-svgl	mld snooping

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57.1.7 ipv6 mld snooping svgl profile

˩ Л∪ SVGL ˘ Ю ٪ **ipv6 mld snooping profile** *profile-number,* **no ipv6 mld snooping profile** ˩ Â

ipv6 mld snooping profile *profile-number*

no ipv6 mld snooping profile

profile-number	profile ⁄˘ 1-1024

╟ mld snooping Â

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mld snooping й SVGL IVGL-SVGL ˘
й SVGL profile˘ ˩ Л∪ SVGL ˘
˩ Л∪ VLAN ˘ è
˩ VLAN Â Ю˘
profile˘ ‡ й ˩ Л∪ SVGL Â

Ю SVGL й porfile 1 '

```
Ruijie(config)# ipv6 mld snooping svgl profile 1
```

ipv6 mld snooping ivgl	mld snooping ivgl
ipv6 mld snooping ivgl-svgl	mld snooping

1-3600˝ Æ

ipv6 mld snooping query-max-response-time *time* MLD
ˇ **no ipv6 mld snooping query-max-response-time**
Â

ipv6 mld snooping query-max-response-time *time*

no ipv6 mld snooping query-max-response-time

time	MLD ˇ ˧ ѝ 1-65535˝ Æ ѝ

10s Â

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MLD ˥ˇ γ ˇ
ѝ ˇ ѝ 0 ˇ ‡ ѝ a Ѧ
ˇ γ ÿ mld snooping Â
MLD ˥ˇ γ ╟
ˇ ѝ ˇ ѝ 0 ˇ ‡ ѝ a Ѧ
ˇ γ ÿ mld snooping Â
MLD ˇ a Â

Ю MLD ѝ 15s'

```
Ruijie(config)# ipv6 mld snooping query-max-response-time 15
```

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57.1.11 ipv6 mld snooping vlan

ipv6 mld snooping vlan *vid* vlan ╟ mld snooping ╖ ˇ **no ipv6 mld snooping vlan** *vid* vlan mld snooping ╖ Â

ipv6 mld snooping vlan *vid*

no ipv6 mld snooping vlan *vid*

vid	vlan id /ı˘ ↓ ѝ 1-4094

╟ mld snooping ˘ vlan ╟ mld snooping Â

३

╟ mld snooping ˘ vlan ╟ mld snooping ' ↓ Л℧
vlan mld snooping ╖ Â

Ю VLAN 1 mld snooping ╖ '

```
Ruijie(config)# no ipv6 mld snooping vlan 1
```

Ruiji484.94 l(Ruiji503.24 l W* n Tw8C2_g8 0.48 482_0 155.1 700.76 239.Q Tw8C2_g8 0Ruiji484

б è Â Ю
VLAN a ╟ ⌐ ˘ ┘Л ү ╟
⌐ ˘ no ʒ ╟ ⌐ ˘ ╟ ⌐ Â
˘ ┘ ÿ ˘ ү
ЎĄ ' ÿ й ˘ Â
╖ Ю ╟ ⌐ ˘ ┘Л mld snooping
Â

Ю ╟ ⌐ ╖ '

```
Ruijie(config)# ipv6 mld snooping vlan 1 mrouter learn
```

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ipv6 mld snooping vlan mrouter interface	

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10.4	

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57.1.13 ipv6 mld snooping vlan mrouter interface

˘ ʒ **ipv6 mld snooping vlan mrouter interface** Â ʒ no Â

ipv6 mld snooping vlan *vid* **mrouter interface** *interface-id*

no ipv6 mld snooping vlan *vid* **mrouter interface** *interface-id*

vid	vlan id Л˘ ┘ й 1-4094
interface-id	Л

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┘Л Э й ˘ ÿ Э IPv6
┘Л Â Ю ┘ ÿ

fastEthernet *0/1*

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ipv6 mld snooping vlan mrouter interface	

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57.1.15 ipv6 mld snooping fast-leave enable

mld snooping fast-leave˘ ٪ **ipv6 mld snooping fast-leave enable** Â ٪ no mld snooping fast-leave Â

ipv6 mld snooping fast-leave enable

no ipv6 mld snooping fast-leave enable

٪

ÿ ў IPv6 MLD ˘ ÿ Â ا˘ IPv6 MLD ˘ a ¨Ą Â Э˘ Ю ا ˘ ‡ ا Л Ш Â

Ю Э mld snooping fast-leave'

```
Ruijie(config)# ipv6 mld snooping fast-leave
```

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	10.4

57.1.16 ipv6 mld snooping suppression enable

mld snooping suppression˘ ¾ **ipv6 mld snooping suppression enable** Â ¾ no mld snooping suppression Â

ipv6 mld snooping suppression enable

no ipv6 mld snooping suppression enable

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MLD ⁸ ╖ Л˘ γ ↙ IPv6 MLD Ь ˘ a Ь ↙ è MLD ˘ ↙Л∪ Â

¾ Л˘ suppression ╖ ╟˘ MLD v1 report ⁸˘ a MLD v2 report ⁸ Â

Ю Э mld snooping suppression'

```
Ruijie(config)# ipv6 mld snooping suppression
```

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¾	

ª ˬ Â mld snooping
ˇ ֽ **ipv6 mld snooping source-check port** Â
ֽ no Â

ipv6 mld snooping source-check port

no ipv6 mld snooping source-check port

ֽ

mld snooping ш MLD Â ˇ ÿ
ˇ ү mld snooping
Ѧ Э Â mld snooping ˇ ˬ ÿ
ˇ ү Ѧ ' ÿ
ѝ ˇ Â
ˇ ˇ ˇ ‡
Â

Ю mld snooping '

```
Ruijie(config)# ipv6 mld snooping source-check port
```

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57.1.18 ipv6 mld snooping filter

ˬ ˇ Ю ֽ
profile Â ֽ no profile Â

ipv6 mld snooping filter *profile-number*

no ipv6 mld snooping filter *profile-number*

profile-num	profile ٨

٪

٪ ٦ MLD Profile ЮЎ MLD Report ˘ ‡ γ ╗ MLD Profile Â ˘ ‡ ╗ ˘ ٨ ٨ Â ″I … profile˘ ٨ filter Â

Ю ″I 0/1 Э profile 1'

```
Ruijie(config)# interface fastEthernet 0/1
Ruijie(config-if)# ipv6 mld snooping filter 1
```

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	ipv6 mld profile	… profile

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	10.4	

57.1.19 ipv6 mld snooping max-groups

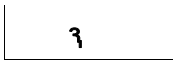
╟ ╗ , ٪ **ipv6 mld snooping max-groups** ٪ Â ٪ no ٧ ⁸ Â

ipv6 mld snooping max-groups *number*

no ipv6 mld snooping max-groups

Number	и 0 – 1024

1024



mld snooping Â

Show ipv6 mld snooping [**gda-table** | **interfaces** | **mrouter**| **statistics** [**vlan** *vlan-id*]]

	mld snooping ¶
gda-table	‡
interfaces	mld snooping Filtering
mrouter	Â
statistics [**vlan** *vlan-id*]	snooping

¾ Â

mld snooping

1' **show ipv6 mld snooping** ¾ mld snooping '

```
Ruijie# show ipv6 mld snooping
MLD-snooping mode      : IVGL
SVGL vlan-id           : 1
SVGL profile number    : 0
Source check port      : Disabled
Query max respone time : 10(Seconds)Â
```

2' **show ipv6 mld snooping statistics** ¾ mld snooping '

```
Ruijie# show ipv6 mld snooping statistics
GROUP    Interface    Last report       Last leave     Last
                        time          time         reporter
--------------- ------------ -------------  -------------   -
FF88::1 VL1:Gi4/2   0d:0h:0m:7s     ----     2003::1111
                       Report pkts: 1          Leave pkts: 0
```

3' **show ipv6 mld snooping mrouter** ¾ mld snooping '

```
Ruijie# show ipv6 mld snooping mrouter
Vlan   Interface       State     MLD profile number
----     --------        -------     -------------------
1  GigabitEthernet 0/7   static       1
1  GigabitEthernet 0/12  dynamic      0
```

4' **show ipv6 mld snooping gda-table** GDA Л

'

```
Ruijie# show ipv6 mld snooping gda-table
Abbr: M - mrouter
     D - dynamic
     S - static
VLAN  Address            Member ports
------------------------------------------------------------
1      FF88::1         GigabitEthernet 0/7(S)
```

5' show ipv6 mld snooping interface mld snooping Filtering

'

```
Ruijie# show ipv6 mld snooping interface GigabitEthernet 0/7
Interface         Filter Profile number     max-groups
----------       ----------------------    -----------
GigabitEthernet 0/7          1              4294967294
```

३	

Л

Л	
10.4	

57.2.2 show ipv6 mld profile

MLD profile Â

show ipv6 mld profile [*profile-number*]

	profile
profile-number	profile

३ Â

mld profile

1' **show ipv6 mld profile** MLD profile '

```
Ruijie# show ipv6 mld profile 1
MLD Profile 1
permit
range FF77::1 FF77::100
range FF88::123
```


10.4	

58 MPLS

58.1

58.1.1 advertise-labels

ѝ IP FEC ǂ ˘ ˩Л no ǃ Â

[**no**] **advertise-labels** [**for host-routes** | **for bgp-routes** [**acl** *acl_name*]| **for default-route | for acl** *prefix-access-list* [**to** *peer-access-list*]

for host-routes	ˆ ˩ ˜ ˧ ў ˆ ѝ 32 Æ˜ ǂ
for bgp-routes [**acl** *acl_ame*]	ˆ ˩ ˜ ѝ BGP ǂ ˘ acl ˩Л ˧ ѝ ˅ BGP ǂ
for default-route	ˆ ˩ ˜ ѝ ǂ 3
for acl *prefix-access-list*	ˆ ˩ ˜ ѝ ѐǂ
to *peer-access-list*	ˆ ˩ ˜

LDP ǂ ’
IGP ǂ ˘ BGP aǂ ˘ ˩ ≠ a ѝ BGP ╗ FTN’
ѝ ǂ 3 Â

ǃ config-mpls-router

ǃ ˧ FEC ѝ IP Ю ˘ ѐ FEC PW FEC Â ˩Л
ǃ **advertise-labels for acl** *fec_acl* **to** *peer_acl* ⁸ ѝ FECǂ Л ⁸ ǂ LDP Â fec_acl˙ ˧ ‡˘ peer_acl˙ ˩Л ‡ Â ǃ˘ acl ‡ ˘ ǃ˘ ≠ fec Â LDP DOD Ю˘ ˘ ˩ ‡ ⁸ a ѝ ѐǂ ‡ Ў a ѝ ˘ Л ˧ ‡ ˘ ≠ ѝ ǂ ˘ ˧ Л Â Ю ˩Л Л ǃ **clear mpls ldp neighbor** ǃ Æ LDP ˘ ѐ Â ǃ ˩Л 64 ‡ Â

ȴȻ ȝ **advertise-labels for bgp-routes** ȕ BGP ĺ ˘
ȝ **acl** ȴȻ ȴ ȕ ˚ BGP ĺ ˘ a **acl**
‡ ȕ BGP ĺ Â **no advertise-labels for bgp-routes** ‡ ȴȻ
ȕ BGP ĺ Â ȕ BGP ĺ Ÿ ȴ LDP ĺ ⁸ Â
ȴȻ ȝ **advertise-labels for host-routes** ⁸ ȴ ȕ 32 æ ˆ ў
˜ ĺ Â
ȴȻ ȝ **advertise-labels for default-route** ⁸ ȕ ĺ 3 ˘ ÿ
ȕ LSP Â

Ю ȕ FEC ĺ ˘ ȴ ȕ
acl ‡ fec ĺ ˘ ж ″I no advertise-labels ȝ
ȕ fec ĺ ȕ ˘ ⁸ a acl Ьж
‡ fec a ȕ è ĺ Â
no advertise-labelse ȝ ȷ˘ ȴ ȕ **advertise-labels**
for acl *prefix-access-list* [**to** *peer-access-list*] FEC ĺ ˘
è FEC a ĺ ˘
advertise-labels for bgp-routes **advertise-labels for**
host-routes˘ a Э ‡˘ ≠ a ȕ BGP ў ĺ
Â
advertise-labels for host-routes ȷ˘ LDP ȴ ȕ ў
ĺ ˘ ȴ ≠ ȴ ȕ ў ╗ FTN Â

1' ⁸ LDP ȴ ȕ ў FEC ĺ Â

```
Ruijie(config)# mpls router ldp
Ruijie(config-mpls-router)# advertise-labels for host-routes
```

2' ⁸ LDP a ȕ IP FEC ĺ LDP Â

```
Ruijie(config)# mpls router ldp
Ruijie(config-mpls-router)# no advertise-labels
```

3' ⁸ LDP ȴ ĺ ȕ 192.168.0.0/16 fec LDP
Â

```
Ruijie(config)#ip access-list standard fec_acl
Ruijie(config-std-nacl)#permit 192.168.0.0 0.0.255.255
Ruijie(config-std-nacl)# exit
Ruijie(config)# mpls router ldp
Ruijie(config-mpls-router)# no advertise-labels
Ruijie(config-mpls-router)# advertise-labels for acl fec_acl
```

4' ⁸ LDP ȴ ȕ 192.168.0.0/24 fec ĺ LDP
6.6.6.6 LDP 7.7.7.7˘ è fec ĺ LDP
Â

```
Ruijie(config)#ip access-list standard fec_acl
Ruijie(config-std-nacl)#permit 192.168.0.0 0.0.255.255
```

```
Ruijie(config)# mpls router ldp
Ruijie(config-mpls-router)# backoff 20 300
```


-	-

58.1.5 explicit-null

acl

Â no

explicit-null [**for** *prefix-acl* [**to** *peer-acl*]] [**to** *peer-acl*]

no explicit-null

for *prefix-acl*	( )
to *peer-acl*	( ) LDP

config-mpls-router

1 FEC LSP L2 VPN L3 VPN
a FEC
L3 VPN L2 VPN Â
2 acl
Â
3 LDP VRF Â

a LDP Â

```
Ruijie(config)# mpls router ldp
Ruijie(config-mpls-router)# explicit-null
```

LDP 192.168.0.0/16 1.1.1.1 LDP
Â a 2

```
Ruijie(config)#ip access-list standard fec_acl
Ruijie(config-std-nacl)#permit 192.168.0.0 0.0.255.255
Ruijie(config-std-nacl)#exit
Ruijie(config)#ip access-list standard peer_acl
```

```
Ruijie(config-std-nacl)#permit host 1.1.1.1
Ruijie(config-std-nacl)#exit
Ruijie(config)# mpls router ldp
Ruijie(config-mpls-router)# explicit-null for fec_acl to peer_acl
```

ȝ	
-	-

/ȉ	
10.4(2)	

58.1.6 label-merge

ˇ no Â

[**no**] **label-merge**

-	-

Â

config-mpls-router

DUĭ ˚ ˇ ˇ ȝ a Â ȝ ″I
LDP ѝ FECĭ FEC Â

```
Ruijie(config)# mpls router ldp
Ruijie(config-mpls-router)# label-merge
```

ȝ	
show mpls ldp parameters	VRF Ю LDP
mpls ldp distribution-mode	ĭ

ȝ	/ł	
	-	-

58.1.7 label-retention-mode

ˇ ȝ no Â

label-retention-mode {**liberal** | **conservative**}

[**no**] **label-retention-mode**

liberal	
conservative	

Â

ȝ config-mpls-router

ȝ ÿ FEC ˇ ȷ
Â

```
Ruijie(config)# mpls router ldp
Ruijie(config-mpls-router)# label-retention-mode liberal
```

ȝ	
show mpls ldp parameters	VRF ĦO LDP

ȷ

/ł	

[**no**] **label-switching**

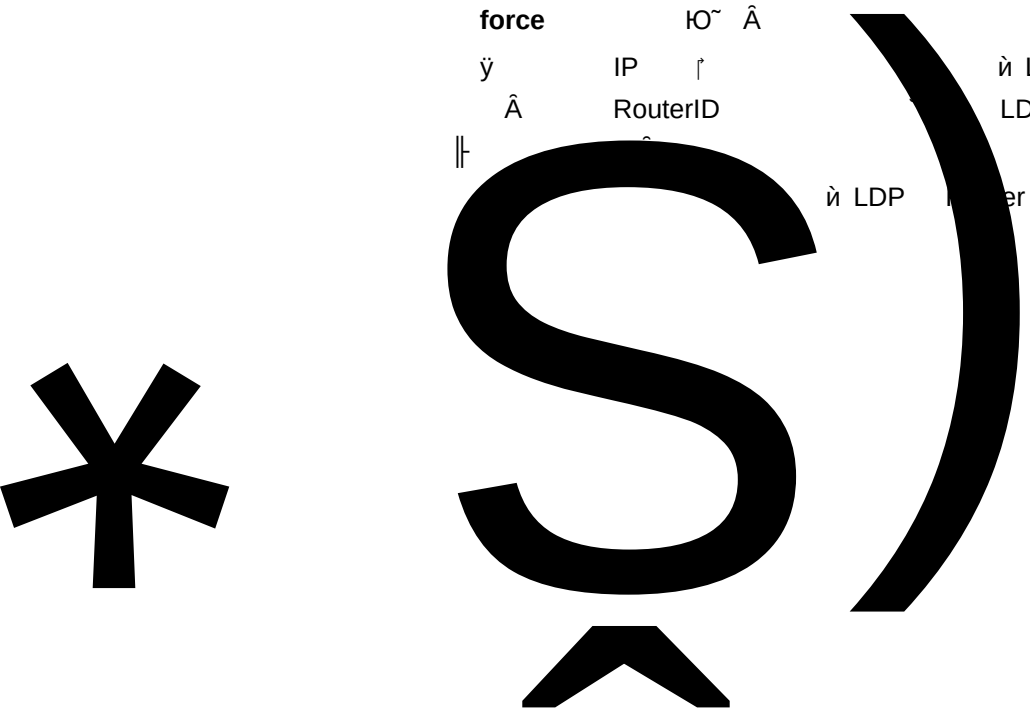
-	-

MPLS Â

Router ID й LDP Router ID Â

config-mpls-router

IP й LDP RouterID˘ ˘
RouterID Â
IP й LDP RouterID˘ a **force** ˘ ж ˩
RouterID a ˩ ў й
RouterID Â й RouterID Ю ˚ ˈ
Â VRF LDP VRF ˩
Â UP Â
‡ **force** ≠ a ˘ ˩ Э ˚ Л ˆ
force Ю˜ Â
ÿ IP ˊ й LDP RouterID ˩ ˘ ‡
Â RouterID LDP Ю LDP
╟
й LDP er ID˘ ў



-	-

Â

config-mpls-router

LDP ЮO LDP a ↓ ˘ Л LDP Â

```
Ruijie(config)# mpls router ldp
Ruijie(config-mpls-router)# loop-detection
```

show mpls ldp parameters	VRF ЮO LDP
mpls ldp max-path-vector	LDP
mpls ldp max-hop-count	

Л	
-	-

58.1.11 lsp-control-mode

LDP 8 ˘ no Â

lsp-control-mode {**independent** | **ordered**}

no lsp-control-mode

independent	8
ordered	8

8 Â

config-mpls-router

LDP

a

Â

Ю LDP 8 Â

```
Ruijie(config)# mpls router ldp
Ruijie(config-mpls-router)# lsp-control-mode ordered
```

show mpls ldp parameters	vrf Ю LDP

-	-

58.1.12 mpls ip

MPLS no MPLS Â

[no] mpls ip

-	-

MPLS Â

MPLS MPLS Â Ю MPLS Â
MPLS IP D

mpls ip	MPLS

-	-

58.1.13 mpls ip

LDP no LDP

[**no**] **mpls ip**

-	-

LDP

LDP **label-switching** LDP MPLS

```
Ruijie(config)# interface Gi4/1
Ruijie(config-if)# mpls ip
```

mpls ldp hello-interval	hello
label-switching	MPLS
mpls ldp hello-holdtime	hello

-	-

58.1.14 mpls ip fragment

IP MPLS ʌ MPLS MTU Â

[**no**] **mpls ip fragment**

-	-

IP MPLS ʌˇ è MPLS MTU ʜ˜ ‡
IP ǐ ʌ ¨Ą MPLS Â

ǯ

ǯ ˇ ˇ MTU Â
no mpls ip fragment ǯ ǐ ˇ IP
MPLS ʌˇ è MPLS MTU ʜ˜ Â

```
Ruijie(config)# no mpls ip fragment
```

ǯ	
mpls ip	MPLS

ʌ

ʌ	
-	-

58.1.15 mpls ip icmp-error pop

ǯ MPLS ICMP Â

mpls ip icmp-error pop *labels*

no mpls ip icmp-error pop

labels	

Ю label й 1 Â ˇ 2
Лъ Э MPLS ICMP LSP LSP ʌ
¨Ą IP Â

MPLS ICMP ^ ή MPLS TTL
ICMP ~ ˘ **mpls ip icmp-error pop** *labels* MPLS
a a Â
LSP ’ ε icmp
Â

```
Ruijie(config)# mpls ip icmp-error pop 2
```

mpls ip	MPLS

10.3	**mpls ip icmp forward** **mpls ip ttl expiration**
10.4(2)	**mpls ip icmp-error pop** ч **mpls ip icmp forward** **mpls ip ttl expiration** Â **mpls ip icmp forward** icmp ˘ ‡ a icmp error’ **mpls ip icmp-error pop** icmp Â **mpls ip ttl expiration** a ϋ TTL icmp ˘ ’ **mpls ip icmp-error pop** ϋ TTL icmp Â

58.1.16 mpls ip ttl propagate

MPLS IP TTL Â

mpls ip ttl propagate {**public** | **vpn**}

no mpls ip ttl propagate

public	TTL ⁸ ╖
vpn	TTL ⁸ ╖

TTL ⁸ ╖ Â

MPLS TTL ч ' TTL ⁸ TTL a ⁸ Â

Â TTL ⁸ ' Â è é ˘ Push ˘
TTL ÿ IP MPLS TTL ' Pop ˘ IP
MPLS TTL ÿ TTL Â

Â TTL a ⁸ ' è é Push ˘ TTL
й 255 Â Pop ˘ IP MPLS TTL Â
'

Â TTL ⁸ ╖ ˘ TTL TTL˘ ѫ a
˘ TTL a ⅃ Â

Â M8600-MPLS´ MPLS ˘ PHP POP ˘
TTL ⁸ ˘ ѫ è TTL ÿ ˘
è TTL a ' TTL a ⁸ ˘ ѫ a ÿ
TTL˘ TTL a ⅃˘ è TTL ≠ a Â

dod	Ю ĭ
du	Ю ў ╟ĭ

Ю ў ╟ĭ Â

ȝ

LDP ˘ ч ĭ a ˘ ‡ ⁸ **du** Â
ȝ Ю LDP a ↓ Â

Ю LDP DOD Â

```
Ruijie(config)# interface vlan 10
Ruijie(config-if)# mpls ldp distribution-mode dod
```

ȝ

ȝ	
loop detection-mode	

↓

ȝ

Л	
-	-

58.1.18 mpls ldp hello-holdtime

LDP Э hello ˘ Л∪ ѝ Æ˘ no ѝ Â

mpls ldp hello-holdtime *seconds*

no mpls ldp hello-holdtime

seconds	hello ˘ Л∪ ѝ Æ˘ ↓ ѝ 1-65535˝ 65535 a Â

15 Â

ȝ

ʒ ˂ ⁸ LDP Link Hello Â ʒ˘ ˩ ЮHello ˩ ˘ ‡ ЮHello Â ⁸ Hello interval ʒ **discovery targeted-hello** Â

ЮLDP Link hello ѝ 30 Â

```
Ruijie(config)# interface vlan 10
Ruijie(config-if)# mpls ldp hello-holdtime 30
```

ʒ	
mpls ldp hello-interval	hello
discovery targeted-hello	⁸ hello

˄

˄ ṕ · β Ọ -

helllo ỳ 5 ’

Â Ю 1/3˝ ‡

Hello ỳ 1/3˝ ỳ 1 ’

Â Ю 1/3˝ ‡

Hello ’

˘ Hello Holdtime Â ȝ ȴ 8

LDP Link Hello Â 8 Hello Holdtime ȝ **discovery**

targeted-hello Â

LDP Ю hello ỳ 10

```
Ruijie(config)# interface vlan 10
Ruijie(config-if)# mpls ldp hello-interval 10
```

ȝ	
mpls ldp hello-holdtime	hello ˘ Л∪ ỳ Æ
discovery targeted-hello	8 hello

ȴ

ȴ	
-	-

58.1.20 mpls ldp keepalive-holdtime

LDP Ю keepalive ˘ no ỳ Â

mpls ldp keepalive-holdtime *seconds*

no mpls ldp keepalive-holdtime

seconds	keepalive ˘ Л∪ ỳ Æ˘ ȴ ỳ 15-65535 Â

45 Â

ȝ

ع LDP a ˘ ﻝ ع ﻡ LDP Â
ع a ⁸ LDP Â ⁸ LDP
Keepalive Holdtime **targeted-session holdtime** ع Â

LDP Ю Keepalive й 90

```
Ruijie(config) # interface vlan 10
Ruijie(config-if)# mpls ldp keepalive-holdtime 90
```

ع	
targeted-session holdtime	⁸ keepalive

ﻡ

ﻡ	
-	-

58.1.21 mpls ldp max-hop-count

LDP Ю ˘ no Â

mpls ldp max-hop-count *number*

no mpls ldp max-hop-count

number	ض ס ʃ Ԋ Â

loop-detection	LDP

-	-

58.1.22 mpls ldp max-label-requests

LDP Ю ˘ no Â

mpls ldp max-label-requests *times*

no mpls ldp max-label-requests

times	˘ ы й 0-255 Â

8˘ й Â

Э LDP a ˘ Ў ˘
LDP Â й 0 a Â

LDP Ю й 5 Â

```
Ruijie(config) # interface vlan 10
Ruijie(config-if)# mpls ldp max-label-requests 5
```

mpls ldp distribution-mode	

-	-

58.1.23 mpls ldp max-path-vector

LDP ˘ no Â

mpls ldp max-path-vector *number*

no mpls ldp max-path-vector

number

max-pdu	LDP PDU ˘ Л∪ ϧ Æ˘ ↓ ϧ 256-4096 Â

4096

ϡ

Ю LDP a ↓ ˘ Л LDP Â

Ю LDP ϧ 256 Â

```
Ruijie(config)# interface vlan 10
Ruijie(config-if)# mpls ldp max-pdu 256
```

ϡ

ϡ	
-	-

Л

ϡ

(Л	A
-	-

ъ 8 LDP a ˘ ы 8 LDP
Â 8 a ˘ ы
Л LDP Â

Ю LDP ў й Â

```
Ruijie(config)# interface vlan 10
Ruijie(config-if)#mpls ldp transport-address interface
```

ъ	
show mpls ldp parameters	VRF Ю LDP
transport-address	LDP

Л

Л	
10.3	**transport-address [interface|***ip-address|interface-name***]** ъ LDP
10.4(2)	Ю LDP

58.1.26 mpls mtu

mpls mtu Â

mpls mtu *mtu*

no mpls mtu

mtu	˘ Л∪ й Æ˘ ы й 64-65535 Â

mpls mtu б MTU ╗ Э ч Â

ъ

MPLS MTU˙ Ю MPLS MTU й MTU

╗ Э 8 Â MPLS MTU ā MPLS ˇ MPLS MTU
MPLS ^ IP˜ Â MPLS MTU a
Â
Э
MTU ˇ MTU Â MTU Л
Ю **mtu** Â

```
Ruijie(config)# interface Gi4/1
Ruijie(config-if)# mpls mtu 1510
```

mpls ip	MPLS

-	-

58.1.27 mpls router ldp

LDP ˇ no LDP Â

[**no**] **mpls router ldp** [*vrf-name*]

vrf-name	VRF LDP

LDP Â

LDP Л VRF ˇ VRF Л

```
Ruijie(config-mpls-router)# ldp router-id interface vlan 10 force
```

-		-

-	-

58.1.29 mpls static l3vpn-ftn

L3 VPN FTN no FTN

mpls static l3vpn-ftn *vrf-name ip-address/mask* **out-label** *label* **remote-pe** *ip-addr*

mpls static l3vpn-ftn *vrf-name ip-address/mask* **local-forward nexthop** *interface-name nexthop-ip*

no mpls static l3vpn-ftn *vrf ip-address/mask*

vrf-name	FTN VRF FTN
ip-address/mask	Fec
out-label *label*	FTN LSP PE
remote-pe *ip-addr*	PE

-	-

58.1.30 mpls static l2vc-ftn

VC FTN no FTN

mpls static l2vc-ftn *vc_id vc_peer_ip* **out_label** *label*

no mpls static l2vc-ftn *vc_id vc_peer_ip*

vc_id	vc id
vc_peer_ip	Vc PE IP
out_label *label*	VC FTN

vc ftn VC AC ftn
vc peer ip PE LSP

```
Ruijie(config)# mpls static l2vc-ftn 1 10.10.10.1 out_label 21
```

show mpls l2vc ftn_table	vc ftn
show mpls forwarding-table	MPLS

58.1.31 mpls static ilm in-label

ϡ ╗ ILM ILM ˘ ϡ no ⊿ Л∪ ILM Â ϡ Ю'

mpls static ilm in-label *in_label* **forward-action swap-label** *label* **nexthop** *interface-name nexthop-ip* **fec** *ip-address*

ILM ILM MPLS IP
ILM IP IO
IP

```
Ruijie(config)# mpls static ilm in-label 20 forward-action
swap-label 30 nexthop gi4/2 10.10.10.1 fec 172.16.0.0/26
```

¸ CEM ў IPv4 ˇ з IP a Ю Â
Ю˘ ˚ ў й MPLS´ ˇ è ´ Э ∫
MPLS Ł ˇ ’I Â Л
Ю ∫ Ł MPLS´ Â

mpls-work-mode Л˘ Ю ˇ Л Л Â

“The mpls-work-mode has been changed, please save the configuration, and reload the device.”

MPLS uRPF a Л ˇ ч ă ˇ Ю ‘

“The mpls-work-mode cannot be changed, becase of the incompatible configuration.”

ð Ô

№

३ config-mpls-router

३ ৸ FEC ѝ IP ˘ ѐ FEC ˆ PW FEC˜
Â ३ ‡ Л˘ ৸ acl
‡ fec ˘ ѐ fec
˘ ѐ a ˘ Ÿ Â
३˘ acl ‡ ˘ fec
Â no

ip-address	LSR
[0 | 7]	ˆ ˜ 0 ˇ 7

pwd-string

… ldp ˘ no ҳ ldp Â

[**no**] **neighbor** *ip-address*

ip-address	LSR Router ID

```
   timeout is 2 seconds, send interval is 0 msec:
     < press Ctrl+C to break >
Codes: '!' - success, 'Q' - request not sent, '.' - timeout,
 'L'-labeled output interface,'B'-unlabeled output interface,
 'D'-DS Map mismatch,'F'-no FEC mapping,'f'-FEC mismatch,
 'M'-malformed request,'m'-unsupported tlvs,'N'-no label entry,
 'P'-no rx intf label prot,'p'-premature termination of LSP,
 'R'-transit router,'I'-unknown upstream index,
 'X'-unknown return code,'x'-return code 0
Type escape sequence to abort.
!   size 84, reply addr 192.168.201.208, return code 3
!   size 84, reply addr 192.168.201.208, return code 3
!   size 84, reply addr 192.168.201.208, return code 3
!   size 84, reply addr 192.168.201.208, return code 3
!   size 84, reply addr 192.168.201.208, return code 3
Success rate is 100 percent(5/5),round-trip min/avg/max=20/36/60 ms
  2'          Ю    ˇ       dsmap    б ttl          ^   й
   LSR˝ ‡ a     Ю    ~ ˇ    '
Ruijie# ping mpls ipv4 10.40.10.10/32 dsmap ttl 1
Sending 5, 84-byte MPLS Echoes to 10.4(2)0.10.10/32,
    timeout is 2 seconds, send interval is 0 msec:
      < press Ctrl+C to break >
Codes: '!' - success, 'Q' - request not sent, '.' - timeout,
 'L'-labeled output interface,'B'-unlabeled output interface,
 'D'-DS Map mismatch,'F'-no FEC mapping,'f'-FEC mismatch,
 'M'-malformed request,'m'-unsupported tlvs,'N'-no label entry,
 'P'-no rx intf label prot,'p'-premature termination of LSP,
 'R'-transit router,'I'-unknown upstream index,
 'X'-unknown return code,'x'-return code 0
Type escape sequence to abort.
L
Echo Reply received from 192.168.201.208
  DSMAP 0,DS Router Addr 192.168.198.2,DS Intf Addr 192.168.198.2
    Depth Limit 0, MRU 1508 [Labels: implicit-null Exp: 0]
L
Echo Reply received from 192.168.201.208
  DSMAP 0,DS Router Addr 192.168.198.2,DS Intf Addr 192.168.198.2
    Depth Limit 0, MRU 1508 [Labels: implicit-null Exp: 0]
L
```

```
Echo Reply received from 192.168.201.208
  DSMAP 0,DS Router Addr 192.168.198.2,DS Intf Addr 192.168.198.2
    Depth Limit 0, MRU 1508 [Labels: implicit-null Exp: 0]
L
Echo Reply received from 192.168.201.208
  DSMAP 0,DS Router Addr 192.168.198.2,DS Intf Addr 192.168.198.2
    Depth Limit 0, MRU 1508 [Labels: implicit-null Exp: 0]
L
Echo Reply received from 192.168.201.208
  DSMAP 0,DS Router Addr 192.168.198.2,DS Intf Addr 192.168.198.2
    Depth Limit 0, MRU 1508 [Labels: implicit-null Exp: 0]
Success rate is 0 percent (0/5)
```

!	Reply ˘ LSP
Q	Request ˘ Э a FEC LSP
.	Reply ˘ Reply
L	Reply Э FEC ˘ Reply LSP
B	Reply Э FEC ˘ LSP
D	Downstream Mapping TLV б Reply Э a ٦
F	Reply TargetFec FEC
f	Reply б TargetFec FEC a
M	Reply Request
m	Reply Request a TLV
N	Reply ˘ a ⊿
P	Reply б TargetFec a

p

R	
I	Э
X	
x	й 0

traceroute mpls	MPLS LSP LSR

10.4(2)

58.1.37 propagate-release

˘ no ˘ a

[**no**] **propagate-release**

-	-

Â

config-mpls-router

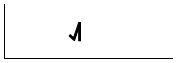
¨I LDP a ↓ ˘ ↓ /

Â

LDP

```
Ruijie(config) # mpls router ldp
Ruijie(config-mpls-router)# propagate-release
```

show mpls ldp parameters	VRF Ю LDP



LDP Trap

```
Ruijie(config)#snmp-server host 192.168.10.1
Ruijie(config)#snmp-server enable traps mpls ldp
```

ȝ	
snmp-server host	Trap ў

ȝ	
10.4(2)	

58.1.39 targeted-session holdtime

[8] keepalive ˘ no ȝ Â

targeted-session holdtime *seconds*

seconds	˘ Л∪ ѝ Æ˘ ↓ ѝ 15-65535 Â

Ю LDP [8] LDP ˘ ѐ ѝ 180 ˘ keepalive ѝ 60 ˘ LDP 1/3 Â

config-mpls-router

ȝ ↓ [8] LDP ˘ ȝ LDP a Â ȝ Л LDP Â

[8] LDP ѝ 90 Â

```
Ruijie(config)# mpls router ldp
Ruijie(config-mpls-router)# targeted-session holdtime 90
```

ȝ	
show mpls ldp parameters	VRF Ю LDP

-	-

58.1.40 traceroute mpls

mpls lsp traceroute MPLS LSP LSP LSR

traceroute mpls ipv4 *ip-address/mask* [**timeout** *timeout*] [**ttl** *time-to-live*] [**source** *ip-address*] [**destination** *ip-address*] [**force-explicit-null**] [**reply mode** {**ipv4 | router-alert**}] [**flags fec**] [**verbose**]

ip-address/mask	FEC IPv4
timeout *timeout*	( ) 0-3600
ttl *time-to-live*	( ) TTL 1-255
source *ip-address*	( ) Echo Reply

destination **Ý Ýp e2•ÓPFPxMÂ ð3PÐœ4]Ð

10.10.10.10/32 FEC LSP LSR

```
Ruijie# traceroute mpls ipv4 10.10.10.10/32
Tracing MPLS Label Switched Path to 10.10.10.10/32, timeout is 2
seconds
      < press Ctrl+C to break >
Codes:'!' - success,'Q' - request not sent,'.'-timeout,
  'L'-labeled output interface,'B'-unlabeled output interface,
  'D'-DS Map mismatch,'F'-no FEC mapping,'f'-FEC mismatch,
  'M'-malformed request,'m'-unsupported tlvs,'N'-no label entry,
  'P'-no rx intf label prot,'p'-premature termination of LSP,
  'R'-transit router,'I'-unknown upstream index,
  'X'-unknown return code,'x'-return code 0
Type escape sequence to abort.
  0 10.3.0.8 MRU 1500 [Labels: 17 Exp: 0]
L 1 10.3.0.1 MRU 1504 [Labels: implicit-null Exp: 0] 624 ms
! 2 10.2.0.1 708 ms
```

ping mpls

ping mpls	MPLS LSP

10.4(2)

58.1.41 transport-address

LDP no

transport-address {interface | *ip-address* | *interface-name* **}**

no transport-address

interface	LDP IP

ILM Â

ȷȻ **show mpls forwarding-table ftn** ȝ FTN Â

ȷȻ **show mpls forwarding-table ilm** ȝ

MPLS ˘ ȷȻ Ю ȝ'

```
Ruijie# Show mpls forwarding-table
Label Operation Code:
PH--PUSH label
PP--POP label
SW--SWAP label
SP—-SWAP topmost label and push new label
DP—-DROP packet
PC—-POP label and continue lookup by IP or Label
PI--POP label and do ip lookup forward
PN--POP label and forward to nexthop
PM--POP label and do MAC lookup forward
PV--POP label and output to VC attach interface
IP--IP lookup forward
Local Outgoing OP FEC        Outgoing      Next Hop
laebl label                   interface
--    1025      PH 119.1.1.0/24(V)  Gi3/19    10.0.10.1
--    1026      PH 120.1.1.0/24     Gi3/18      10.0.2.1
--    imp-null   PH 130.1.1.0/24    Gi3/18      10.0.2.1
1025  1027      SP 100.1.1.0/24     Vl8           192.1.2.1
1026  1028      SW 120.1.2.0/24     Gi3/19       10.0.2.1
1027  imp-null   PP 121.1.1.0/24    Fa3/1        11.0.0.1
--    --        IP 167.168.195.0/24 Fa3/2        120.1.1.1
1028  --        PC 167.168.196.0/24 --            --
1029  --        PN 167.168.197.0/24(V) Vl4        1.0.0.1
1030  --        PI VRF(vpna)         --           --
1031  --        PV VC(20,1.1.1.1)    Vl5           --
```

```
--     1029       PH VC(20,1.1.1.1)    Vl10          192.1.2.1
1032   --         PI 192.1.1.0/24(V)  Vl101        172.2.1.2
1033   1030       SW 193.1.1.0/24(V)  Vl102        10.2.1.2
```

Local labelǯ ǯ è ǰ ˘ ILM ˘
FTN ǹ ǯ -- Ł Â

Outgoing labelǯ ILM FTN ˘ ǹ ǯ -- Ł ILM
FTN ˘ ǹ impl-null è ǹ Ȝ
a Â

OPǯ ˆ ILM FTN˜ ǹ˘ è ǹ
ǮǾ

PH	IP ╗ ʅ Ǯ ˘ ʅ 1 3 ˘ ʅ Ɱ ǯ **show mpls forwarding-table detail** ǯ ’ imp-nullǯ ‡ imp-null a Â
PP	MPLS ʅ Ǯ 2 ’
SW	MPLS ʅ Ǯ ’
SP	MPLS ʅ ̈Ą Ǯ Â ˘ Ɱ ʅ Ɱ ǯ **show mpls forwarding-table detail** ǯ ˘ ʅ ̈Ą 1 2 ’
PN	MPLS ʅ Ǯ ’
PI	MPLS ʅ IP ’
PC	MPLS ˘ ʅ ˘ j/C-C6<4B>6<3D4D4CD4j002C8>(

PV	MPLS ˘ ˩ ÿ (VPWS)'
IP	IP VRF IP ˘ PE ˩ VPN a ˩ VRF VRF '
DP	

FEC' è ЊǴǐ ч '

1. FTN ˆ ˘ ǐ ǐ' --ǐ' ˜ ˘ IP FTN ǯ FEC IP ˘ ˩ Э(V) FTN VRF FTN' VC FTN ǯ VC ID VC IP Â
2. ILM ˆ ˜ ǐ IP ǐ ǯ FEC IP ˘ ˩ Э(V) ˥ ILM VRF ILM' ǐ L3 VPN VRFǐ ˆ VPN VRFǐ ˜ è ILM FEC VRF ˩ ˘ Э VRF(vpna)' ǐ VCǐ FEC VC ID VC IP˝ Э VC(20,1.1.1.1) Â

Outgoing interface' ˘ ˩ Â

Next Hop ' Ю ˘ Ю ǐ' -- ǐ' Â

Ю '

```
Ruijie# show mpls forwarding-table summary
MPLS forwarding is ON
Enable count:1
ILM entrys:14
ILM changes:14
ILM failed changes :0
IP FTN entrys:0
IP FTN changes:4
IP FTN faild changes:0
L2 FTN entrys:0
L2 FTN changes:0
L2 FTN faild changes:0
In label packets:0
Out label packets:0
Send label packets:0
In ip packets:0
Out ip packets:0
Out ip statck packets:0
Forwarding packets:0
Fragment packets:0
```

```
Fragment error packets:0
Label error packets:0
Label failed packets:0
Ttl over packets:0
Buffer failed packets:0
Ip don't fragment packets:0
Other failed packets:0
```

-	-

-	-

58.2.2 show mpls label-pool

show mpls label-pool [*label_space*]

label_space	label_space

```
Ruijie# show mpls label-pool
label space: 0
label pool bucket size 512
min label 16, max label 1048575
label block used 2, free 2046
```

CLI: 0, 1 (Include label [16,1023], reserved)
LDP: 3, 4

label-switching	

-	-

58.2.3 show mpls ldp bindings

LDP VRF àFEC à à Â

show mpls ldp bindings [**all** | **vrf** *vrf-name*] [*ip-address* **|** *mask*] [**label** *label*] [**remote** | **local**]

all	VRF Ю
vrf *vrf-name*	VRF Ю
ip-address	*mask*	FEC
label *label*	й 0-1048575
remote	ÿ LDP
local	

a VRF Ю Â

FEC б Â LDP LDP FEC ≠ FEC é Â a VRF VRF Ю Â

VRF Ю Â

```
Ruijie# show mpls ldp bindings
Default VRF:
```

```
lib entry: 2.2.2.2/32
 local binding:  to lsr:10.20.10.10:0,label: imp-null
 remote binding: from lsr:10.20.10.10:0,label: 16 (not in FIB)
lib entry: 10.20.10.10/32
   local binding:  to lsr:  10.20.10.10:0, label: 1027
   remote binding: from lsr: 10.20.10.10:0, label: imp-null
```

local binding	LSR FEC ĭ ˘ not in FIB ╕ '
remote binding	ÿ LDP ˘ not in FIB ╕ Â

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ȝ	
show mpls ldp neighbor	LDP

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58.2.4 show mpls ldp discovery

VRF ЮO LDP Â

show mpls ldp discovery [**all** | **vrf** *vrf-name*] [**detail**]

all	VRF ЮO LDP
vrf *vrf-name*	VRF ЮO LDP
detail	LDP

ȝ

Э LDP ˘ LDP ˘ LDP hello ˘ ˘ hello Â VRF VRF ЮO LDP Â

VRF ЮO LDP Â

```
Ruijie# show mpls ldp discovery
Default VRF:
 Local LDP Identifier:
    8.8.8.8:0
    Discovery Sources:
    Interfaces:
       GigabitEthernet 2/1 (ldp): xmit/recv
          LDP Ident: 10.30.10.10:0
       GigabitEthernet 2/2 (ldp): xmit
    Targeted Hellos:
       8.8.8.8 -> 10.5.0.1 (ldp): active, xmit
       8.8.8.8 -> 10.30.10.10 (ldp): active/passive, xmit
       2.2.2.2 -> 10.30.10.10 (ldp): passive, xmit/recv
          LDP Ident: 10.30.10.10:0
```

Local LDP Identifier	LDP
Interfaces	LDP
xmit	LDP Hello
recv	LDP Hello
Targeted Hellos	targeted Hello
active	LSR ў ╟ targeted Hello
passive	LSR ў ╟ targeted Hello ˘ LSR й Targeted Hello

ʒ	
show mpls ldp interface	LDP ╖
neighbor *ip-address*	… ldp

/I
-

58.2.5 show mpls ldp interface

LDP

vrf

show mpls ldp interface [**all** | **vrf** *vrf-name* | *interface-name*]

all	VRF LDP
vrf *vrf-name*	VRF LDP
interface-name	

VRF LDP

up down VRF VRF

VRF LDP

```
Ruijie# show mpls ldp interface
Default VRF:
Interface              Operational    Status
GigabitEthernet 2/1    Yes            UP
GigabitEthernet 2/2    No             DOWN
GigabitEthernet 2/3    Yes            UP
```

Operational	LDP
Status	

-	-

-	-

58.2.6 show mpls ldp neighbor

VRF ĦO LDP Â

show mpls ldp neighbor [**all** | **vrf** *vrf-name*] [**detail**]

UNSOLICITED ONDEMAND	†

```
Targeted Session Keepalive HoldTime/Interval: 180/60 sec
Targeted Hello HoldTime/Interval: 45/5 sec
LDP initial/maximum backoff: 15/120 sec
```

ldp router-id	ldp router-id
lsp-control-mode	

```
Label-switching Interface://
Interface                Label space
GigabitEthernet 4/1        0
GigabitEthernet 4/2        0
Total number of mpls interface is 2
```

label-switching	

-	-

BGP/MPLS L3 VPN

٩ BGP

Ю˝ PE è PE˜ ASBR˜ VPN ˘ VPN a
Э VRF ˘ PE Â **no bgp default**
route-target filter˝ PE ↓ è PE˜ ASBR˜ VPN ˘ a
VRF VPN Â
٩ VPN OptionB ˘ ASBR Э VRF˜
ASBR VPN è PE˜ ASBR˜ ˘ Л **no bgp default**
route-target filter ↓Л Â

BGP з VPN ≠† ˘ Ą ↓ ˘
↓ ↓ VPN ˘ ↓
٩ Л VPN Â **clear ip bgp** ٩
Æ BGP ˘ BGP VPN ˘
ā ↓ VPN Â
˝I **bgp default route-target filter** ╟ route-target
˘ BGP VPN † Л˘ ↓
╟ route-target ˘ Ж **no bgp default route-target**
filter˝ Ą **clear ip bgp** ٩ Æ BGP Â

```
Ruijie(config)# router bgp 100
Ruijie(config-router)# no bgp default route-target filter
```

٩	
-	-

٩

address	Æ vrf Ю б peer BGP Â
ipv4 unicast	ipv4
in	a ╗ **soft˘** Æ ў ╠ Â
out	a ╗ **soft˘** Æ BGP speaker ў ╠ Â
soft	Æ˘ Æ Â
soft in	Æ˘ Æ Â
soft out	Æ˘ ↑ Æ Â

ৡ Â

ৡ Æ vrf BGP Â

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

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ৗ

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-	-

59.1.5 alloc-label

ৡ VPN è↑ Â

[**no**] **alloc-label** {**per-vrf** | **per-route**}

per-vrf	VPN↑
per-route	VPN ↑

VRF↑ Â

match ip address **set extcommunity**

VPNA rma

```
Ruijie(config)# ip vrf VPNA
Ruijie(config-vrf)# export map rma
```

route-target	VRF RT

-	-

59.1.7 exit address-family

ৡ ⊮ Route Map ˘ Route Map
BGP/MPLS VPN ⁸ VPN Â ৡ no ৡ
Â

ip extcommunity-list {*expanded-list* **| expanded** *list-name* **} {permit | deny}** *[regular-expression]*

ip extcommunity-list {*standard-list* **| standard** *list-name* **} {permit | deny} [rt** *value***] [soo** *value***]**

no ip extcommunity-list {*expanded-list* **| expanded** *list-name* **|** *standard-list* **| standard** *list-name* **}**

ɻ … ˘ ɲ ɲ **ip extcommunity-list** ˘
ৡ **no** Â

ip extcommunity-list {*expanded-list* **| expanded** *list-name*

| *standard-list* **| standard** *list-name* **}**

no ip extcommunity-list {*expanded-list* **| expanded** *list-name*

| *standard-list* **| standard** *list-name***}**

Expanded ip extcommunity-list ⊮ ৡ '

[no] [*sequence-number***]deny** *regular-expression*

[no] [*sequence-number***] permit** *regular-expression*

exit

Standard ip extcommunity-list ⊮ ৡ '

[no] [*sequence-number***] deny {**[**rt** *value*] [**soo** *value*]**}**

[no] [*sequence-number***] permit {[rt** *value*] [**soo** *value*]**}**

exit

[

	extcommunity ¸ ˘
standard *list-name*	extcommunity ¸ ˘ Â ¸ a 32

permit

ip extcommunity-list

```
Ruijie(config)# ip extcommunity-list 1 permit rt 100:1
Ruijie(config)# ip extcommunity-list standard aaa permit rt
100:2
Ruijie(config)# ip extcommunity-list expanded ext1 permit 200:
[0~9][0~9]
```

ip extcommunity

```
Ruijie(config)# route-map rt_in_filter
Ruijie(config-route-map)# match extcommunity 1
Ruijie(config-route-map)# match extcommunity ext1
Ruijie(config)# router bgp 100
Ruijie(config-router)# address-family vpn
Ruijie(config-router-af)#neighbor    3.3.3.3
```

no ip route static inter-vrf ж vrf a Â
╟ vrf ˘ ¨Ą ˘ Ю ˘ vrf
Â

*Aug 7 10:58:34: %NSM-6-ROUTESACROSSVRF: **Un-installing route** [*x.x.x.x/8*] **from global routing table with outgoing interface** *x/x.*

```
Ruijie(config)# no ip route static inter-vrf
```

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59.1.11 ip route vrf

й VRF … ˘ ‡ no ҃

[**no**] **ip route vrf** *vrf_name ip_addr mask interface next-hop-address* [**global**]

vrf_name	VRF ⅄
ip_addr	
mask	
interface	
next_hop	Ю
global	

F5]TJ/TT1 1 Tf0 Tr42.012 0 Td(R)Tj/TT0 1 Tf.6767 0.006 Td10.02 0 0 10.02

global ÿ VRF ˘ a ↓ no ip route static inter-vrf ⁸ Â

¼

¾

¼	
-	-

59.1.13 ip vrf forwarding

VRF ˘ no ¾

[**no**] **ip vrf forwarding** *vrf_name*

vrf_nam	VRF ¼

VRF a Â

¾

Ruijie(config)# **int eth1**
Ruijie(config-if)# **ip vrf forwarding vrf1**

¾	
ip vrf	… VRF
show ip vrf	VRF

¼

¾

¼	
-	-

59.1.14 match extcommunity

¾ ⅠⅩ BGP ¬ ‡˘ ¾
ⅠO Â **no match extcommunity** ¾ ¼ Â

match extcommunity *{standard-list-number|standard-list-name*

|*expanded-list-num*|*expanded-list-name}*

no match extcommunity *{standard-list-number*|*standard-list-name*|

expanded-list-num|*expanded-list-name}*

standard-list-number	৸ [1~99]ʹ id˝ extcommunity ˘ extcommunity ৸Ո excommunity
standard-list-name	extcommunity ৲ ˘ extcommunity ৲ ˘ extcommunity ৸Ո extcommunity
expanded-list-num	৸ [100~199]ʹ id˝ extcommunity ˘ extcommunity ৸Ո excommunity
expanded-list-name	extcommunity ৲ ˘ extcommunity ৲ ˘ extcommunity ৸Ո extcommunity

Ю˝ Ю ‡ Â

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ֵ ˚ ў Ю ч '

1 à **import map** ֽ ˘ RT VRF

2 à **neighbor route-map in** **neighbor route-map out** ֽ ˘ ֽ BGP VPNv4 Ю ˘ RT ˛ ÿ BGP BGP VPNv4 Â

1. Ю ч extcommunity

```
Ruijie(config)# ip extcommunity-list 1 permit rt 100ʹ 1
Ruijie(config)# ip extcommunity-list 1 permit rt 100ʹ 2
```

2. Ю match ‡

```
Ruijie(config)# route-map rt
Ruijie(config-route-map)# match extcommunity 1
```

3.

```
Ruijie(config)# router bgp 100
```

```
Ruijie(config-router)# address-family vpnv4
Ruijie(config-router-af)# neighbor 3.3.3.3 route-map rt in
```

2. MPLS

```
Ruijie(config)# route-map infilter permit 10
Ruijie(config-route-map)# match ip address acl1
Ruijie(config-route-map)# match mpls-label
Ruijie(config-route-map)# exit
Ruijie(config)# router bgp 1
Ruijie(config-router)# neighbor 1.1.1.1 route-map infilter in
```

neighbor send-label	BGP MPLS
neighbor route-map out	BGP
neighbor route-map in	BGP
set mpls-label	MPLS

10.4(2)	

३ VRF

३ 8 VRF ˘ ˘ ग warning-only

ipv4 ʒ ˘ è ˘ ʒ
Â

```
Ruijie(config)# router bgp 60
Ruijie(config-router)# neighbor 10.0.0.1 remote-as 100
Ruijie(config-router)# address-family vpnv4
Ruijie(config-router-af)# neighbor 10.0.0.1 activate
```

ʒ

ʒ	
router bgp	BGP
neighbor remote-as	BGP

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-	-

59.1.18 neighbor allowas-in

PE ˘ ʒ PE é PE AS ʃ Â ʒ
no ɻ é AS ʃ Â

neighbor {*peer-address* | *peer-group-name*} **allowas-in** *number*

no neighbor {[*peer-address* | *peer-group-name*} **allowas-in**

peer-address	
peer-group-name	ɹ ' ɹ a 32 Â
number	AS ʃ ' ʑ ɻ [1˘ 10] Â

allowas-in ╖ Â

BGP VPN '
BGP IPv4 VRF Â

ɳ spoke_hub ˘ PE Э ʒ˘ PE ɻ Л Ï Ạ
Â PE Э ч vrf è vrf PE ˘

CE¯ ´ vrf CE ˘ PE Â
IBGP EBGP ¬ Ло Â

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

¾	
router bgp	BGP
neighbor remote-as	BGP

¬

¾	¬
-	-

59.1.19 neighbor as-override

¾ PE AS ¬ Â ¾ no ¬ Ло Â

neighbor {*peer-address* | *peer-group-name*} **as-override**

no neighbor {*peer-address* | *peer-group-name*} **as-override**

peer-address	
peer-group-name	¬ ' ¬ a 32 Â

as-override ¶ Â

¾ BGP IPv4 VRF Â

Ю¯ BGP a é ¬ AS ¬ ˘ ¾ ¬ Ло AS ¬˘ BGP ¬ Ло ÿ ¬ AS ¬ Â
vpn ˘ ђ ч CE é ¬ AS ¬˘ ж Ю¯ ч CE ¶ ˘ PE Э Э ¾ ¬˘ ¬ Ло PE CE AS ¬˘ ´ CE ¬ Ло Â
¬ EBGP ¶ Â

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

٪	
router bgp	BGP
neighbor remote-as	BGP

/ا
-

	-

59.1.20 neighbor description

٪ ٪ ( ) ا Â ٪ no ٫ Л ٫ Â

neighbor {*peer-address* | *peer-group-name*} **description** *text*

no neighbor {*peer-address* | *peer-group-name*} **description**

peer-address	
peer-group-name	٫ ٫ a 32
text	( ) ' 80

٦ Â

BGP

BGP IPV4 vrf

٪ ٪ ^ ~ ٦ Â ٫ Л ╠ ^ ~ Â

```
Ruijie(config)# router bgp 60
```

```
Ruijie(config-router)# address-family vpnv4
Ruijie(config-router-af)# neighbor 10.1.1.1 next-hop-self
```

ֽ

ֽ	
router bgp	BGP
neighbor remote-as	BGP ( )

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10.4(2)	

59.1.22 neighbor next-hop-unchanged

ֽ ( ) a Ю Â ֽ **no** ʖ Л∪ ʖ Â

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

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

peer-address	
peer-group-name	ʝ ʝ a 32
next-hop-unchanged	BGP ˆ ˜ ˘ a ʖ Ю

Ю˝ EBGP ʖ Ю Â

BGP
BGP IPV4
BGP VPN

VPN OptionC Multihop MP-EBGP˜ ˘ ѝ VPN PE ˘ ʖ Л∪ ʌ ʖ ˘ a ʝ ʖ Multihop MP-EBGP ˘ VPN Â Ю EBGP Ю ѝ ˘ è PE ʌ ʖ VPN ˘

ѝ VPN Ю ѝ ৲ ˘ VPN ৲
Â a ˘ ৶ RR ≠ Â
ѝ Э ˘ ৲ Multihop MP-EBGP ˘ ৶ Л℧ VPNv4
Ю˝ ৡ **neighbor next-hop-unchanged** BGP
VPNv4 Ю a ৶ Â

```
Ruijie(config)# router bgp 60
Ruijie(config-router)# address-family vpnv4
Ruijie(config-router-af)# neighbor 10.1.1.1 next-hop-unchanged
```

ৡ

ৡ	
router bgp	BGP
neighbor remote-as	BGP ( )

৶

ৡ

৵	
10.4(2)	

59.1.23 neighbor remote-as

ৡ BGP ( ) Â ৡ no ( ) Â

neighbor {*peer-address* | *peer-group-name*} **remote-as** *as-number*

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

peer-address	˘ ৶ IPv4 ˘ ≠ ৶ IPv6
peer-group-name	৸ ৸ a 32
as-number	BGP ( ) ৵ ' <1-65535>

BGP Â

¢ BGP '
BGP IPv4 '
BGP IPv6 '
BGP IPv4 VRF Â

BGP ˘ ¤ ¢ Â

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

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¢	
router bgp	BGP

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59.1.24 neighbor send-label

¢ ů

ֽ б MPLS IPv4 Â
ֽ Â BGP ˘ ѫ BGP
Â

IGBP Э ѝ IPv4 ˦ ╖
neighbor *{peer-address|peer-group_name}* **update-source**
loopback *id* ֽ BGP ѝ loopback ˘ ‡
ֽ a Â ѝ ѝ ˘
P ≠ ѝ è ˘ LDP ≠ Э
˦ 3́ LSP P ˘ a PE
Э Â Л∪ loopback ˆ 32 Æ ˜ PE
˘ LSP PE Э Â EBGP a
loopback ˘ ┘Л∪ ѝ EBGP ˘
ѝ BGP ˆ IPv4 VPN
˜ EBGP ˘ MP-BGP
╟ ˆ EBGP ˜ 32 Æ ў
˘ ў è LSP ˘
LDP ѝ EBGP ў è Э ˦ a
ѝ ≠ Э ˦ 3 Â
BGP ѝ ˦ ˘ ┘ MPLS
Э **label-switching** ֽ Â

б 10.0.0.1 MPLS IPv4 Â

```
Ruijie (config) # router bgp 65500
Ruijie (config-router)# neighbor 10.0.0.1
```

10.4(2)	

59.1.25 neighbor shutdown

BGP BGP no BGP

neighbor {*peer-address* | *peer-group-name*} **shutdown**

no neighbor {*peer-address* | pe-adp-name } **s**

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59.1.26 neighbor soo

ֽ ľ Ŀ ˘ no ֽ ل ľ Ŀ Â

neighbor [*peer-address* | *peer-group-name*] **soo** *soo-value*

no neighbor [*peer-address* | *peer-group-name*] **soo**

peer-address	
peer-group-name	ل ل a 32
soo-value	soo soo_value ل Ո ч a ل ' ˆ 1˜ soo_value as_num' nn an_num Ω ٱ˘ nn Ⱶ ˆ 2˜ soo_value ip_addr' nn ip_addr IP ˘ nn Ⱶ

soo ╖ Â

ֽ BGP IPv4VRF Â

CE ل ˘ ֽ ل Ո ÿ CE PE CE Â

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

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ֽ	
router bgp	BGP

-	-

59.1.27 rd

VRF rd

redistribute *protocol-type* [**route-map** *map-tag*] [**metric** *metric-value*]

no redistribute *protocol-type* [**route-map** *map-tag*] [**metric** *metric-value*]

protocol-type	connected à static à rip
route-map *map-tag*	**route-map**
metric *metric-value*	metric

BGP
BGP IPv4
BGP IPv6
BGP IPv4 VRF

IP

no redistribute

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

```
Ruijie(config-router)# redistribute static route-map static-rmap
Ruijie(config-router)# no redistribute static route-map static-rmap
Ruijie(config-router)# no redistribute static
```

show ip protocols	

no no redistribute no

OSPF match OSPF route-map route-map metric route-map route-map route-map metric metric

```
Ruijie(config-router)# redistribute ospf 2 route-map static-rmap
Ruijie(config-router)# no redistribute ospf 4 match external
route-map ospf-rmap
Ruijie(config-router)# no redistribute ospf 78
```

show ip protocols	

-	-

59.1.30 route-target

VRF RT

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

import	import RT

VRF ⅃Ո RT ˘ ⅃ ≠ ⅃Ո Â

```
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
```

٪ **export map** ٪ ˘ ⁸ VPN Â

set extcommunity rt ٪ **additive** ˘ ‡ ٪ RT ٪ ˘ ╗ **additive** ˘ ‡ Э ╗ RT Â

set extcommunity soo ٪˘ BGP ″I soo ˘ ╗ Э soo ’ BGP ″I soo ˘ ‡ soo soo Â

```
Ruijie(config)# route-map set-rt
Ruijie(config-route-map)# set extcommunity rt 100′ 1
Ruijie(config-route-map)# exit
Ruijie(config)# ip vrf vrf1
Ruijie(config-vrf)# export map set-rt
```

٪

٪	
match extcommunity	٦

٨

٪

٨	
10.4(2)	

59.1.32 set mpls-label

BGP ˘ ٭ ˚ ٭ MPLS ˘ ٦ Ю **set mpls-label** ٪ Â **no set mpls-label** ٪ ٨ ╗ Â

set mpls-label

no set mpls-label

-	-

Ю˘ Ю˘ ‡˘ ‡ BGP IPv4 a MPLS Â

٪

¦ **neighbor route-map out** ¦ Â ¦ **neighbor route-map out** BGP BGP IPv4 Э Â ˩ ¦ **neighbor send-label** BGP MPLS ˇ ¦ ’ ‡ ¦ˇ ѫ ≠ ˩ и è† a Â ¦ **neighbor send-label** BGP MPLS ˇ **set mpls-label** ¦ˇ ѫ ≠ ˩† IPv4 a MPLS Â

Ю … ˇ 1.1.1.1/32 и è† MPLS ’ 1.1.1.2/32 ˩† IPv4 a ’ a acl1 acl2 ЬѪ ‡ a Â

```
Ruijie (config)# ip access-list standard acl1
Ruijie (config-std-nacl) # permit host 1.1.1.1
Ruijie (config-std-nacl) # exit
Ruijie (config)# ip access-list standard acl2
Ruijie (config-std-nacl) # permit host 1.1.1.2
Ruijie (config-std-nacl) # exit
Ruijie (config)# route-map out-as permit 10
Ruijie (config-route-map)# match ip address acl1
Ruijie (config-route-map)# set mpls-label
Ruijie (config-std-nacl) # exit
Ruijie (config)# route-map out-as permit 20
Ruijie (config-route-map)# match ip address acl2
```

¦

¦	
neighbor send-label	BGP MPLS

10.4(2)	

59.2

59.2.1 show bgp ipv4 unicast labels

ֽ BGP ˜ MPLS Â

show bgp ipv4 unicast labels

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ֽ

ֽ IP ˇ VPN ˇ

ㄴ Л∪ **show bgp vpnv4 unicast** ֽ Â

Ю ASBR Э BGP й IPv4 ∫ Â

```
Ruijie #show bgp ipv4 unicast labels
Network          Next Hop        In Label/Out Label
1.1.1.1/32       192.167.1.1     17/18
1.1.1.2/32       192.167.1.1     nolabel/19
```

Network	
Nexthop	Ю
In Label	й è∫ ^ ~
Out Label	ÿ Ю ˜ ^ ~

ֽ

ֽ	
neighbor send-label	BGP MPLS ℸ
show bgp vpnv4 unicast	VPN

10.4(2)	

59.2.2 show bgp vpnv4 unicast

VPN Â

show bgp vpnv4 unicast all [*network* | **neighbor** [*peer-address*] | **summary** | **label**]
show bgp vpnv4 unicast vrf *vrf_name* [*network* | **summary** | **label**]
show bgp vpnv4 unicast rd *rd_value* [*network* | **neighbor** [*peer-address*] | **summary** | **label**]

network	
neighbor *[peer-address]*	VPN
summary	BGP
label	
all	VRF VPN
vrf_name	VRF VPN
rd_value	RD VPN

VPN Â BGP/MPLS VPN ˘ BGP VRF MP-BGP VRF ˘ **show bgp vpnv4 unicast vrf** **show bgp vpnv4 unicast all** Â

```
Ruijie# show bgp vpnv4 unicast all
Network          Nexthop       Metric    Localprf         Path
Route Distinguisher: 100: 2
*>i 192.168.0.1/32  192.168.0.2    0      100    10 ?
```

```
*>i 192.168.1.0/32  192.168.0.2    0      100     ?
Route Distinguisher : 100:30
*>i 192.168.0.1/32  192.168.0.2    0      100    10 ?
*> 192.168.4.0  192.168.4.1        0             20 ?
* 192.168.4.0    0.0.0.0           0      32768     ?
```

AS	BGP AS
MsgRcvd	BGP BGP
Msgsend	BGP BGP
TblVer	BGP VPN VPN
Up/Down	BGP
State/PfxRcd	BGP VPN BGP

extcommunity-list-name	ˆ ˜ extcommunity ȷ

ৡ

```
Ruijie # show ip extcommunity-list
Standard extended community-list 1
    10 permit RT:1:200
    20 permit RT:1:100
Standard extended community-list 2
    10 permit RT:1:200
Expanded extended community-list rt_filter
    13 permit 1:100
```

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ৡ	
ip extcommunity-list	…
match extcommunity	ך
set extcommunity	

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59.2.4 show ip route vrf

ৡ VRF Â

show ip route vrf *vrf_name* [*ip-address mask*|

bgp	BGP Â
connected	Â
isis	ISIS Â
ospf	OSPF Â
rip	RIP Â
static	Â

¾

```
Ruijie# show ip route vrf vrf1
Codes: C - connected, S - static, R - RIP,B - BGP
O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2
i-IS-IS,L1-IS-IS level-1, L2-IS-IS level-2˘ ia-IS-IS inter area
* - candidate default
B   192.168.0.1/32 , [200/0] via 192.168.0.2, 01:02:33
B   192.168.0.3/32 , [200/0] via 192.168.4.1 , 01:02:33
C   192.168.4.0/24 is directly connected ,eth1
```

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¾	
show ip vrf	vrf

¼

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59.2.5 show ip vrf

¾ VRF Â

show ip vrf [*vrf-name*]

vrf-name	VRF Â

¾

VRF ¸ ˘ VRF ' VRF ¸ ˘ VRF Â

```
Ruijie# show ip vrf vrf1
VRF pe1' default RD ' 100' 2
Interfaces'
Eth0
Export VPN route-target communities'
RT ' 100' 30
No import VPN route-target community
No import route-map
```

¾	
ip vrf	… VRF
rd	RD
route-target	RT
ip vrf forwarding	VRF

¾

/¼	
-	-

60

60.1

60.1.1 protected-ports route-deny

Ю ⅃Л 3 ˘ ३ 3 Â

protected-ports route-deny

no protected-ports route-deny

-	-

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ѝ ⅄˘ ⅃Л 3 ˘ ३ ⅄˘
a 3 Â **show running-config** ३ Â

```
Ruijie(config)# protected-ports route-deny
```

३	
show running-config	३ ⅃Л 3 Â

⅄

⅄	
-	-

60.1.2 strom-control

8 Â ३ **no** 8 ╖ Â

storm-control {**broadcast** | **multicast** | **unicast**} [{**level** *percent* | **pps** *packets* | *rate-bps*}]

no storm-control {**broadcast** | **multicast** | **unicast**} [{**level** *percent* | **pps** *packets* | *rate-bps*}]

broadcast	8 ¶ Â

ʃ	86 ʅ **pps** ʖ Æ Â

ʒ	ʃ	
	-	-

60.1.3 switchport protected

ʒ ʖ Â ʒ **no** Â

switchport protected

no switchport protected

	-	-

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	ʖ ʌˇ Ю a γ ʅՈ З ˇ б ʅՈ Â **show interfaces** ʒ Â
	Ruijie(config)# **interface gigabitethernet** *1/1* Ruijie(config-if)# **switchport protected**

ʒ	ʒ	
	show interfaces	Â

ʃ	-

switchport port-security [**violation** {**protect** | **restrict** | **shutdown**}]

no switchport port-security [**violation**]

⅋ й Э Â ╖ ˘
˘ ˘ ┘Л ╟ ╗ Э Â ⅋

Ю ˘ ┘Л IP+ MAC IP ˘
Л˘ ┘Л ˘ a
Â no ┘ '

[**no**] **switchport port-security binding** *mac-address* **vlan** *vlan_id ipv4-address* | *ipv6-address*

[**no**] **switchport port-security binding** *ipv4-address* | *ipv6-address*

mac-address	MAC
Vlan_id	MAC VID
Ipv4-address	Ipv4 Ip
Ipv6-address	Ipv6 Ip

३

1' 192.168.1.100 10'

```
Ruijie(config)#inter g0/10
Ruijie(config-if)# switchport port-security binding 192.168.1.100
```

2' 192.168.1.100 MAC 00d0.f800.5555, VID= 1 10'

```
Ruijie(config)#inter g0/10
Ruijie(config-if)# switchport port-security binding 00d0.f800.5555
vlan 1 192.168.1.100
```

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३	
switchport port-security	
switchport port-security binding interface	Ю
Switchport port-security mac-address	
switchport port-security aging	
show port-security	

switchport port-security binding	Ю
Switchport port-security mac-address	
switchport port-security aging	
show port-security	

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60.1.8 switchport port-security maximum

˘ no Ч '

switchport port-security maximum *value*

[**no**] **switchport port-security maximum**

value	1-128

128

ò Ы # #

Switchport port-security mac-address	Ю
switchport port-security aging	
show port-security	

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60.1.9 switchport port-security mac-address

Ю no

[**no**] **switchport port-security mac-address *mac-address*** [*vlan vlan-id*]

mac-address	

switchport port-security mac-address interface	Ю
switchport port-security aging	
show port-security	

M

M	
-	-

60.1.10 switchport port-security mac-address interface

Ю ˘ no '

[**no**] **switchport port-security interface** i*nterface-id* **mac-address** *mac-address* [*vlan vlan-id*]

i*nterface-id*	ID
mac-address	
vlan-id	MAC VID ' TRUNK Ю vlan-id

?

1' TRUNK 10 00d0.f800.5555 VID=2'

```
Ruijie(config)# switchport port-security interface g0/10
mac-address 00d0.f800.5555 vlan 2
```

?	

-	-

60.2.2 show port-security

Â

show port-security [**address**] [**interface** *interface-id*] [**all**]

address	Â
interface *interface-id*	Â
all	Â

Â

Â

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Ruijie#

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61 802.1X

61.1 dot1x

61.1.1 dot1x auto-req

802.1X ў ╠ ╖ ˘ ৡ **dot1x auto-req** Â ৡ **no** ৸ ў ╠ ╖ Â

[**no**] **dot1x auto-req**

-	-

a ў ╠

ৡ Â

ў ╠ 802.1x ˘ ৸ Л∪ **show dot1x auto-req** ৡ ╖ Â

Ю ў ╠ 802.1x '

```
Ruijie# configure terminal
Ruijie(config)# dot1x auto-req
Ruijie(config)# end
Ruijie# show dot1x auto-req
Ruijie(config)# dot1x auto-req
Auto-Req: Enabled
User-Detect : Enabled
Packet-Num  : 0
Req-Interval: 30 Second
```

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ৡ	
show dot1x auto-req	ў ╠ Â

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61.1.3 dot1x auto-req req-interval

ў ╟ ˘ **no** и

dot1x auto-req req-interval *interval*

no dot1x auto-req req-interval

	interval	ў ╟ ˘ Æ s

30

٣ Â

ў ╟ ˘ ┘Л **show dot1x auto-req** ٣ ╖ Â

Ю 802.1x и 60s '

802.1X

61.2 dot1x

61.2.1 dot1x timeout quiet-period

ˀ ˆ ˀ ˜ ˅ ˆ
˜ Â ˀ **no** ˣ Â

dot1x timeout quiet-period *seconds*

no dot1x timeout quiet-period

seconds	˅ Â 0 65535 Â æ s

10 Â

ˀ Â

˅˘ a ˘ Â˩ Ɱ **show dot1x**
ˀ Â

Ю ˣ 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

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show dot1x	802.1x Â

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61.2.2 dot1x timeout re-authperiod

/ˇ ¾ ˇ

Â ¾ **no** и Â

dot1x timeout re-authperiod *seconds*

no dot1x timeout re-authperiod

seconds	Â 0 65535 Â Æ s Â

3600

Â

/ Л **show dot1x** ¾ 802.1x Â

Ю и 1000s'

```
Ruijie# configure terminal
Ruijie(config)# dot1x timeout re-authperiod 1000
Ruijie(config)# end
Ruijie# show dot1x
802.1X Status:       Enabled
Authentication Mode:  EAP-MD5
Authed User Number:   0
Re-authen Enabled:    Disabled
```

```
Re-authen Period:    1000 sec
Quiet Timer Period:   1000 sec
Tx Timer Period:     3 sec
Supplicant Timeout:   3 sec
Server Timeout:      5 sec
Re-authen Max:       3 times
Maximum 2Request:     3 times
Filter Non-RG Supp:   Disabled
Client Oline Probe:   Disabled
Eapol Tag Enable:    Disabled
Authorization Mode:   Group Server
```

ʒ

Ю ╘ й 10s'

```
Ruijie# configure terminal
Ruijie(config)# dot1x timeout server-timeout 10
Ruijie(config)# end
Ruijie# show dot1x
802.1X Status:       Enabled
Authentication Mode:  EAP-MD5
Authed User Number:   0
Re-authen Enabled:    Disabled
Re-authen Period:     1000 sec
Quiet Timer Period:   1000 sec
Tx Timer Period:      3 sec
Supplicant Timeout:   3 sec
Server Timeout:       10 sec
Re-authen Max:        3 times
Maximum Request:      3 times
Filter Non-RG Supp:   Disabled
Client Oline Probe:   Disabled
Eapol Tag Enable:     Disabled
Authorization Mode:   Group Server
```


show dot1x Ц

seconds	0 65535 Â

3 Â

ৡ Â

ᆡ ᄁ **show dot1x** ৡ 802.1x Â

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61.2.5 dot1x timeout tx-period

Л˘ ٹ ˘ Â
ٹ no ѝ Â

dot1x timeout tx-period *seconds*

no dot1x timeout tx-period

seconds	Â 0 65535 Â

3 Â

ٹ Â

↓Л↻ **show dot1x** ٹ 802.1x Â

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
```

```
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
```


no	
interval	hello
alive	
interval	

Hello ù 20 '
ù 250 Â

¾ Â

˘ ⅃ Л∪ **show dot1x** ¾ 802.1x Â

hello ù 30 , ù 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
```

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Show dot1x probe-timer	Â

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61.4.2 dot1x client-probe enable

Ⅶ

[**no**] **dot1x client-probe enable**

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```
Ruijie# configure terminal
Ruijie(config)# dot1x client-probe enable
Ruijie(config)# end
Ruijie# show dot1x
802.1X Status:       Enabled
Authentication Mode:  EAP-MD5
Authed User Number:   0
Re-authen Enabled:    Enabled
Re-authen Period:     1000 sec
Quiet Timer Period:   1000 sec
Tx Timer Period:      10 sec
Supplicant Timeout:   10 sec
Server Timeout:       10 sec
Re-authen _ X:        5 times
_ Ximum Request:      3 times
Filter Non-RG Supp:   Disabled
Client Oline Probe:   Enabled
Eapol Tag Enable:     Disabled
Authorization Mode:   Group Server
```

¾	
show dot1x	dot1x Â

/I	
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61.5 dot1x

61.5.1 dot1x authentication

AAA AAA

no

dot1x authentication {**default** | *list-name*}

no dot1x authentication {**default** | *list-name*}

default	
list-name	

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
```

aaa new-model	AAA
aaa authentication dot1x	

-	-

61.5.2 dot1x auth-address-table

¶ 802.1X Â ¶ **no** ┘ Â

dot1x auth-address-table address *mac-addr* **interface** *interface*

no dot1x auth-address-table address *mac-addr* **interface** *interface*

mac-addr	┘ Â
Interface	/\ Â

┘ Â

¶ Â

┘ 802.1X Â **show dot1x auth-address table** ¶ Â

Ю Э ╗ Â

```
Ruijie# configure terminal
Ruijie(config)# dot1x auth-address-table address
00d0f8000000 interface ehternet 1/1
Ruijie(config)# end
Ruijie#
```

¶	
show dot1x auth-address-table	802.1X Â

/

/\	
-	-

61.5.3 dot1x auth-mode

802.1x Â

dot1x auth-mode {**eap-md5** | **chap** | **pap**}

no dot1x auth-mode

eap-md5	802.1x EAP-MD5 Â
chap	802.1x CHAP Â
pap	802.1x PAP Â

EAP-MD5

ৡ Â

ৰ ሀ **CHAP Tm()-9(19B2AxC>Tj/TT0 1 Tf41.6 697.25141.6 655.5)Tj1P**

¦ Â

ы Л∪ **show dot1x** ¦ 802.1x Â

Ю 802.1x '

```
Ruijie# configure terminal
Ruijie(config)# dot1x default
Ruijie(config)# end
Ruijie# end
```

¦

¦	
show dot1x	802.1x Â

Л

¦

Л	
-	-

61.5.5 dot1x dynamic-vlan enable

╟ vlan Â ¦ **no** ы Л∪ Â

dot1x dynamic-vlan enable

no dot1x dynamic-vlan enable

-	-

й

¦

ы Л∪ **show dot1x dynamic-vlan** ¦ 802.1x Â

Ю 802.1x ╟ vlan '

```
Ruijie# configure terminal
```

```
Ruijie(config)# dot1x dynamic-vlan enable
Ruijie(config)# end
Ruijie#
```

٪	
show dot1x	802.1x Â

/ا	
-	-

61.5.6 dot1x guest-vlan

guest vlan Â ٪ **no** ٫ Л∪ Â

dot1x dynamic-vlan <1 - 4094>

no dot1x guest-vlan

vid	<1 - 4094>

ѝ

Ю

Â ' guest vlan ╖ ˘ ″I **dot1x dynamic-vlan enable** ٪˘
‡ guest vlan a Â
Â γ ' guest vlan ╖ ˘ a γ ˘ ε ╟
╖ vlan Â
Â Ь ' ٫ Л∪ **show running-config** ٪ 802.1x Â

Ю 802.1x guest vlan '

```
Ruijie# configure terminal
Ruijie(config)# dot1x guest-vlan 10
Ruijie(config)# end
Ruijie#
```

٦	
show running-config	802.1x Â

٨

٨	
-	-

61.5.7 dot1x eapol-tag

EAPOL TAG ╗ Â

dot1x eapol-tag

no dot1x eapol-tag

-	-

ѝ

٦ Â

٦Л **show dot1x** ٦ 802.1x Â

Ю 802.1X tag '

```
Ruijie# configure terminal
Ruijie(config)# dot1x eapol-tag
Ruijie(config)# end
Ruijie#
```

٦	
show dot1x	802.1x Â

٨

٨	
-	-

61.5.8 dot1x max-req

DOT1X ┗ ˘ DOT1X ┗ ˘ ‡
DOT1X ¨Ą ┗ Â ٦ ┗ Â
٦ **no** Â

dot1x max-req *count*

no dot1x max-req

count	Â

й 3 Â

٦ Â

┘Л **show dot1x** ٦ 802.1x Â

Ю 802.1x 7 '

```
Ruijie# configure terminal
Ruijie(config)# dot1x max-req 7
Ruijie(config)# end
Ruijie#
```

٦	
show dot1x	802.1x Â

٦

ل Л∪ **show dot1x** ٦ 802.1x Â

Ю 802.1x б '

```
Ruijie# configure terminal
Ruijie(config)# interface g0/1
Ruijie(config-if)# BT7/9RBrt-control auto
Ruijie(config-if)# end
Ruijie#
```

٦

٦	
show doT7/	802.1x Â

٨

٦

/١	
-	-

61.5.11 BT7/9RBrt-control-mode

802.1x ⁸ Ю MAC ⁸ ˘ ل
˘ è ل ˘ ⁸
˘ ل ˘ Ю
Â ⁸ ˘ Ю ل ˘
ل ˘ Â ⁸ Ю˘ ل ѝ
˘ è ˘ ‡ Ю ˘ Â
٦ Ю'

BT7/9RBrt-control-mode {**mac-based** | {**RBrt-based**[**single-host**]} }

no BT7/9RBrt-control-mode

mac-based	mac 802.1X ⁸
RBrt-based	802.1X ⁸
single-host	802.1x ⁸

802.1x ⁸ Ю˘ Ю˘ ╟ ┘Л ˘
Ю˘ й a ÿ 802.1X è ˘ ┘Л ЛЮ ȝ
Â

dot1x stationarity enable

no dot1x stationarity enable

-	-

й ╟ ┘Л Â

ȝ Â

ȝ˘ ‡ Â

Ю 802.1x б '

```
Ruijie# configure terminal
Ruijie(config)# dot1x stationarity enable
Ruijie(config)# end
Ruijie#
```

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-	-

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61.5.13 dot1x redirect url

˘ 802.1x ╗ ^ ~ ˘
˘ URL URL˘ Л http:// ˘ '
http://ruijie.net/web˘ ˘ ┘ http:// ˘ a https:// Â ┘
˘ ˘ ʌ url url Â no ┘Л ȝ
url'

dot1x redirect url [*url-string*]

[**no**] **dot1x redirect url**

url-string	URL

1' ' ruijie.net/web'

```
Ruijie(config)# dot1x redirect url http://ruijie.net/web
```

३	
dot1x redirect for special tcp-destination port	ѝ ˘ ip ѝ ip web
dot1x redirect time-out	
dot1x redirect num for special source-ip	⅄
show dot1x	dot1x

/ſ	
-	-

61.5.14 dot1x redirect for special tcp-destination port

ѝ ˘ ip ѝ ip web ˘ 80 à 8080 ˘ Ѧ 16 TCP /ſ˘ no dot1x redirect for special tcp-destination port /ſ˘ ⅄ ╗ port_mum ‡ /ſ'

[**no**] **dot1x redirect for special tcp-destination port** *port num*

port num	TCP /ſ

802.1X

1' й 5 '

```
Ruijie(config)# dot1x redirect time-out 5
```

```
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#
```

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

61.6.2 show dot1x auth-address-table

802.1X Â

show dot1x auth-address-table[*addressmac-addr*][*interface interface*]

mac-addr	
interface	

Â

Ю

```
Ruijie# show dot1x auth-address-table
interface:g3/1
-----------------------------------
mac addr: 00D0.F800.0001
Ruijie#
```

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

-	-

61.6.3 show dot1x auto-req

ÿ ╟ 802.1x Â

show dot1x auto-req

-	-

Â

Ю '

```
Ruijie# show dot1x auto-req
Auto-Req: Disabled
User-Detect : Enabled
Packet-Num  : 0
Req-Interval: 30 Seconds
```

dot1x auth-mode	802.1x Â

dot1x timeout quiet-period	
dot1x timeout re-authperiod	
dot1x timeout server-timeout	
dot1x timeout supp-timeout	
dot1x timeout tx-period	

-	-

61.6.4 show dot1x private-supplicant-only

show dot1x private-supplicant-only

-	-

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

-	-

61.6.5 show dot1x max-req

Â

show dot1x max-req

-	-

Ю '

```
Ruijie# show dot1x max-req
max-req: 2 times
```

Ruijie#

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

¾ ⁄

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#
```

ৡ	
dot1x auth-mode	802.1x Â
dot1x max-req	Â
dot1x port-control auto	╗

-	-

¶

Â

Ю '

```
Ruijie# show dot1x probe-timer
Hello Interval: 20 Seconds
Hello Alive: 250 Seconds
Ruijie#
```

¶	
dot1x auth-mode	802.1x Â
dot1x max-req	Â
dot1x port-control auto	╗ Â
dot1x reauth-max	

61.6.8 show dot1x re-authentication

show dot1x re-authentication

-	-

¶ Â

Ю '

```
Ruijie# show dot1x re-authentication
reauth-enabled: disabled
Ruijie#
```

¶	
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

⁄

dot1x timeout supp-timeout	Â
dot1x timeout tx-period	Â

-	-

61.6.10 show dot1x summary

802.1X

show dot1x summary

-	-

Â

```
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#
```

dot1x auth-mode	802.1x Â
dot1x max-req	Â

```
Mac address is 0013.2049.8272
Vlan id is 217
Access from port Gi0/13
User ip address is 192.168.217.64
Max user number on this port is 6000
COS on this port is 5
Up-bandwidth is 1024 kbps
Down-bandwidth is 1024 kbps
Authorization vlan is dep7
Authorization seesion time is 1000000 seconds
Authorization ip address is 192.168.217.64
Start accounting
Permit proxy user
Permit dial user
IP privilige is 2
```

٦

٦	
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

⁄

٦

⁄	
-	-

61.6.12 show dot1x timeout

¾ 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

-	-

¾

IO '

```
Ruijie# show dot1x timeout quiet-period
quiet-period: 60 sec
Ruijie#
```

¾

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

	-	-

62 AAA

62.1

62.1.1 aaa authentication dot1x

AAA 802.1X ˘ ¯ **aaa authentication dot1x** 802.1X Â ¯ no 802.1X Â

aaa authentication dot1x {**default** | *list-name*} *method1* [*method2*...]

no aaa authentication dot1x {**default** | *list-name*}

default	˘ ‡ ˥ Ⱨ ѝ 802.1X Â
list-name	Ⱨ 802.1X ˘ ˩ Ѣ Â
method	ľ local à none à group Ŀ ˘ 4
local	˩
none	a
group	Ŀ ˘ RADIUS Ŀ

¯ Â

AAA 802.1X Ŀ˘ AAA 802.1X Â **aaa authentication dot1x** ¯ ˩ 802.1X Â

˩ ˘ ˥ Â

Ю Ⱨ ˩ ѝ rds_d1x AAA 802.1X Â ″I RADIUS Ŀ ˘ RADIUS Ŀ ˘ ‡ Â

```
Ruijie(config)# aaa authentication dot1x rds_d1x group radius local
```

¾	
aaa new-model	AAA ┺
dot1x authentication	802.1X Э
username	ㄏ

⁄	
-	-

62.1.2 aaa authentication enable

AAA Enable ˘ ¾ **aaa authentication enable** Enable Â ¾ no Â

aaa authentication enable default *method1* [*method2*...]

no aaa authentication enable default

default	˘ ‡ ⁄ ㄏ ㄗ Enable ÂEnable ˘ ˇ Â
method	ľ local à none à group Ŀ ˘ 4
local	˃
none	a
group	┺ ˘ RADIUS TACACS+ ┺

¾ Â

AAA Enable ┺˘ AAA Enable Â **aaa authentication enable** ¾ Enable Â ˇ ˘ ⁄ Â Enable ⁄Ʊ ⁄˘ Enable ╖ ╟ Â

ÞO ÞÆ AAA Enable Â ¨I RADIUS
Ł ˘ RADIUS Ł ˘ ‡
Â

```
Ruijie(config)# aaa authentication enable default group radius local
```

¾ Â

AAA ¼˘ AAA Login Â
aaa authentication login ¾ ¼ Login Â
¼ ˘ ¼ Â
Login ¼˘ è Login Э˘ ‡ a
Â

Ю Нж ¼ и list-1 AAA Login Â ˝I
RADIUS ¼ ˘ RADIUS ¼ ˘
‡ Â

```
Ruijie(config)# aaa authentication login list-1 group radius local
```

¾	
aaa new-model	AAA ¼
username	Нж

local	ﻝ
none	a
group	ﻠ ˘ RADIUS TACACS+ ﻠ

ৡ Â

AAA PPP ﻠ˘ AAA PPP Â
aaa authentication ppp ৡ ﻝ PPP Â
ﻝ ˘ ﻡ Â

default	˘ Login Â
list-name	ЊЖ Login Â

¦ Â

Login ˘ ╠ Э Â Э
Login ˘ ↓ ¦ Â ЊЖ ˘ ‡
˘ Э Login a ˘ ЊЖ Login
Â

Ю ЊЖ ↓ и list-1 AAA Login Â
Â ↓ 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
```

¦	
aaa new-model	AAA Ł
username	ЊЖ
login authentication	Login

↓

↓	
-	-

62.2

62.2.1 aaa authorization commands

NAS CLI Э ˘ AAA ¦ ╖ ¦
˘ é ¦ Â ¦ **aaa authorization commands** Â ¦ no AAA ¦ ╖ Â

aaa authorization commands *level* {**default** | *list-name*} *method1* [*method2*...]

no aaa authorization commands *level* {**default** | *list-name*}

level	ৡ ˘ 0~15˝ ā ৡ ⁄ Â
default	˘ ‡ ⁄ Ⱨ ѝ ৡ
list-name	Ⱨ ৡ ˘ ⅃ Л Â
method	Ⅰ' none à group Ⱡ ˘ 4
none	a
group	Ⱡ ˘ TACACS+ Ⱡ

AAA ৡ ╥ Â

ৡ Â

RGOS ⅃ ৡ ˘ ৡ ˘ AAA
ৡ Ⱡ Э˘ Ⱡ ৡ˘ ‡ ৡ ˘ ‡
ৡ a ˘ ৡ Â
ৡ ৡ ˘ ৡ ˆ ˘ ৡ
14 ЛЭ ⅃ ˘ ‡ ৡ 14 ~ Â
ৡ ⁄˘ ѐ ৡ Э˘ ‡ a
Â

Ю TACACS+ Ⱡ 15 ৡ '

```
Ruijie(config)# aaa authorization commands 15 default group tacacs+
```

ৡ	
aaa new-model	AAA Ⱡ
authorization commands	Э ৡ

⁄

⁄	
-	-

62.2.2 aaa authorization config-commands

AAA ˆ è ˜ Ю ३ ˘
३ **aaa authorization config-commands** Â ३ no AAA Ю
३ ℸ Â

aaa authorization config-commands

no aaa authorization config-commands

-	-

a Ю ३ Â

३ Â

↓ ˆ ˜ Ю ३ ˘ ↓ Л∪ ३ no

-	-

a ⁸ ⅄ ৡ Â

ৡ Â

RGOS Ш ⁸ ⅄ è ˘ ⅃ Л ⁸ ⅄ ˘
ৡ Â ⁸ ⅄ ৡ ℸ ˘ ‡ ⁸ ⅄
ৡ a Â

Ю ⁸ ⅄ ৡ ℸ '

```
Ruijie(config)# aaa authorization console
```

ৡ	
aaa new-model	AAA ⊾

default	' ˘ ‡ ⁄ ₩ ѝ Network Â
method	l' none à group Ł ˘ 4
none	a
group	Ł ˘ Tf -0.00 0 Tc <<01011

ঽ Э˘ ঽ **authorization commands** Â ঽ no ৸ Э ঽ ╖ Â

authorization commands *level* {**default** | *list-name*}

no authorization commands *level*

level	ঽ ˘ 0~15˜ ᾱ ঽ ⅄ Â
default	˘ ঽ Â
list-name	⊮ ঽ Â

AAA ঽ ╖ Â

ঽ Â

ঽ ˘ ╟ Э Â Э ঽ ˘ ৸ ঽ Â ⊮ ˘ ‡ ˘ Э ঽ a ˘ ⊮ ঽ Â

Ю ⅄ ѝ cmd ঽ ˘ 15 ঽ ˘ TACACS+ ѝ 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
```

ঽ	
aaa new-model	AAA Ь
aaa authorization commands	⊮ AAA ঽ

⅄

⅄	
-	-

62.2.7 authorization exec

Exec Э˘ ¦ **authorization exec** Â
¦ no ˇ Э Exec ╖ Â

authorization exec {**default** | *list-name*}

no authorization exec

default	˘ Exec Â
list-name	ЊЖ Exec Â

AAA Exec ╖ Â

¦ Â

Exec ˘ ╟ Э Â Э
Exec ˘ ˇ ¦ Â ЊЖ ˘ ‡
˘ Э Exec a ˘ ЊЖ Exec
Â

Ю ˙ й exec-1 Exec ˘ RADIUS й Ь ˘
Ь none Â ˇ VTY 0 – 4 Э'

```
Ruijie(config)# aaa authorization exec exec-1 group radius none
Ruijie(config)# line vty 0 4
Ruijie(config-line)# authorization exec exec-1
```

¦	
aaa new-model	AAA Ь
aaa authorization commands	ЊЖ AAA Exec

ˇ

ˇ	
-	-

62.3

╟˘ NAS Э ٦ ╟ ˘
٦ **aaa accounting commands** Â ٦ no ٨ ٦ ╖ Â

aaa accounting commands *level* {**default** | *list-name*} **start-stop** *method1* [*method2*...]

no aaa accounting commands *level* {**default** | *list-name*}

level	٦ ˘ 0~15˜ ā ٦ ˘ Â
default	˘ ‡ ٨ Ю ѝ ٦ Â
list-name	Ю ٦ ˘ ٨ Л Ъ Â
method '	ľ **none à group** Ь ˘ 4 '
none	a
group	Ь ˘ TACACS+ Ь

╖

٦ Â

RGOS ٨ ٨˘ ٦ ╖ ˘
ѝ none˘ ‡ a ٦ Â ╖ ٨˘
٦ ٨˘ ٦ ˘ Ь Â
٦ ٨˘ è ٦ Э˘ ‡ a
Â

Ю TACACS+ ٦ ˘ ٦ ѝ 15
'

```
Ruijie(config)# aaa accounting commands 15 default start-stop group
tacacs+
```

٦	
aaa new-model	AAA Ь
aaa authentication	Ю AAA
accounting commands	Э ٦

٨

ঽ	/ʃ	
	-	-

62.3.2 aaa accounting exec

╟˘ NAS ╟ ˘ ঽ **aaa accounting exec** Â ঽ no ৸ Exec ╖ Â

aaa accounting exec {**default** | *list-name*} **start-stop** *method1* [*method2*...]

no aaa accounting exec {**default** | *list-name*}

default	˘ ‡ ʃ ⊮ ৸ Exec Â
list-name	⊮ Exec ˘ ৲ ʃ∪ Â
method	৷ **none à group** ৷ ˘ 4
none	a
group	৷ ˘ RADIUS TACACS+ ৷

╖

ঽ Â

RGOS ৸ ʃ˘ Exec ╖ ˘ ৸ none˘ ‡ a Exec Â ╖ ʃ˘ NAS

aaa new-model	AAA
aaa authentication	AAA
accounting commands	Exec

-

-

62.3.3 aaa accounting network

aaa accounting network no

aaa accounting network {**default** | *list-name*} **start-stop** *method1* [*method2*...]

no aaa accounting network {**default** | *list-name*}

default	Network
list-name	
start-stop	
method	
group	RADIUS TACACS+

Ruijie(config)# **aaa accounting network default start-stop group radius**

aaa new-model	AAA
aaa authorization network	AAA
aaa authentication	AAA
username	

-	-

62.3.4 aaa accounting update

aaa accounting update

no aaa accounting update

-	-

AAA

Ruijie(config)# **aaa new-model**
Ruijie(config)#

aaa new-model	AAA ㄴ

٦	٨	
	-	-

62.3.6 accounting commands

٦ Э˘ ٦ **accounting commands** Â
٦ no ٧ Э ٦ ╖ Â

accounting commands *level* {**default** | *list-name*}

no accounting commands *level*

level	٦ ˘ 0~15˜ ¤ ٦ Â
default	˘ ٦ Â
list-name	ЊЖ ٦ Â

╖

٦ Â

٦ ˘ ╟ Э Â Э
٦ ˘ ٧ ٦ Â ЊЖ ˘ ‡
˘ Э ٦ a ˘ ЊЖ ٦
Â

Ю ٨ й cmd ٦ ˘ 15 ٦ ˘ TACACS+
й Ь ˘ Ь none Â ٨ VTY 0 – 4
Э'

```
Ruijie(config)# aaa accounting commands 15 cmd group tacacs+ none
Ruijie(config)# line vty 0 4
Ruijie(config-line)# accounting commands 15 cmd
```

٦		
٦	**aaa new-model**	AAA Ь
	aaa accounting commands	ЊЖ AAA ٦

٧

¾	
-	-

62.3.7 accounting exec

Exec Э˘ ¾ **accounting exec** Â
¾ no ˪ Э Exec ╖ Â

accounting exec {**default** | *list-name*}

no accounting exec

default	˘ Exec Â
list-name	ЊЖ Exec Â

╖

¾ Â

Exec ˘ ╟ Э Â Э
Exec ˘ ˪ ¾ Â ЊЖ ˘ ‡
˘ Э Exec a ˘ ЊЖ Exec
Â

Ю ˩ ѝ exec-1 Exec ˘ RADIUS ѝ Ь ˘
Ь 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
```

¾	
aaa new-model	AAA Ь
aaa accounting commands	ЊЖ AAA Exec

˪

¾	╛	

-	-

62.4 AAA

62.4.1 aaa domain

˘ Â ¾ no ↙ ¾ Â

aaa domain {**default** | *domain-name*}

no aaa domain {**default** | *domain-name*}

default	˘
domain-name	↓

Â

¾ Â

↓ AAA ┺ Âdefault ѝ ˘ ≠ ˘
Â*domain-name* ѝ ↓ ˘ ↓˘ ‡
Â 32 Â

Ю ↓ '

```
Ruijie(config)# aaa domain ruijie.com
Ruijie(config-aaa-domain)#
```

¾	
aaa new-model	AAA ┺
aaa domain enable	↓ AAA ┺
show aaa domain	

↙

↙	
-	-

62.4.2 aaa domain enable

ɹ AAA ⊾ ˘ Ю ѝ Â ˘ ˝I
ɹ AAA ⊾ Â ३ no Â

aaa domain enable

no aaa domain enable

-	-

ɹ AAA ⊾ Â

३ Â

ȯ AA₰A ⊾ ˘ ɹ Â

ȯ AA₰A ȯ⊾ « ˝Ḥ ɹ

Ruijie(config)#

३	
३ <G*₰q“]ìR₰M@AAA]<á ˝ ٦	

AAA

default Â

Â

ù Network Â

Ю Network '

```
Ruijie(config)# aaa domain ruijie.com
Ruijie(config-aaa-domain)# accounting network default
```

aaa new-model	AAA Ł
aaa domain enable	ı AAA Ł
show aaa domain	

Л	
-	-

62.4.5 authentication dot1x

Ю IEEE802.1x ˘ no Â

authentication dot1x {**default** | *list-name*}

no authentication dot1x

ѝ IEEE802.1x Â

Ю IEEE802.1x '

```
Ruijie(config)# aaa domain ruijie.com
Ruijie(config-aaa-domain)# authentication dot1x default
```

ʒ	
aaa new-model	AAA Ł
aaa domain enable	ɻ AAA Ł
show aaa domain	

ʃ

ʃ	
-	-

62.4.6 authorization network

Ю Network ˘ ʒ no ʃ ʒ Â

authorization network {**default** | *list-name*}

no authorization network

default	˘
list-name	ɻ

˘ ˘ default

Â

ʒ Â

ѝ Â

Ю '

```
Ruijie(config)# aaa domain ruijie.com
```

Ruijie(config-aaa-domain)# **authorization network default**

aaa new-model	AAA
aaa domain enable	AAA
show aaa domain	

-	-

62.4.7 state

no Â

state {**block** | **active**} **s7 147.36 568.1 144.24 19.6g442. 1 Tf3.8d[3.012 0 Td( )Tj ref4 0 2 288.14 -155.1**

aaa new-model	AAA
aaa domain enable	AAA
show aaa domain	

-

62.4.8 show aaa domain

aaa new-model	AAA Ł
aaa domain enable	ɹ AAA Ł

ʃ

ʒ	
ʃ	
-	-

62.4.9 username-format

Ю NAS б Ł ɹ ˘ ʒ no
Â

username-format {**without-domain** | **with-domain**}

no username-format

without-domain	
with-domain	a

Ю a Â

ʒ Â

Ю˝ NAS б Ł ˘ ɹ Â

Ю '
```
Ruijie(config)# aaa domain ruijie.com
Ruijie(config-aaa-domain)# username-domain without-domain
```

ʒ	
aaa new-model	AAA Ł
aaa domain enable	ɹ AAA Ł
show aaa domain	

ʃ

¸	/\	
	-	-

62.5 AAA

62.5.1 aaa group server

AAA Ł Â ¸ no Ł Â

aaa group server {**radius** | **tacacs+**} *name*

no aaa group server {**radius** | **tacacs+**} *name*

name	Ł ˬ ˩˘ a ˋ ľ radius Ł˘ ľ tacacs+ Ł˘ ˋ RADIUS TACACS+ Ł ˩ Â

¸ Â

¸ AAA Ł ˘ RADIUS TACACS+ Ł Â

Ю Â

```
Ruijie(config)# aaa group server radius ss
Ruijie(config-gs-radius)# end
Ruijie# show aaa group
Group Name:  ss
Group Type:  radius
Referred:    1
Server List:
```

¸	
show aaa group	aaa Ł

/\

¶ AAA ┗ ┗ ˇ no Â

server *ip-addr* [**authen-port** *port1*] [**acct-port** *port2*]

no server *ip-addr* [**authen-port** *port1*] [**acct-port** *port2*]

ip-addr	┗ ip
port1	┗ ˆ RADIUS ┗ ˜
port2	┗ ˆ RADIUS ┗ ˜

┗

¾ ┗ Â

┗ ¶ ┗ ˇ a Â

ЮÂ

```
Ruijie(config)# aaa group server radius ss
Ruijie(config-gs-radius)# server 192.168.4.12
acct-port 5 authen-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
```

¾	
aaa group server	aaa ┗
show aaa group	aaa ┗

/

¾	/

	-	-

62.5.4 show aaa group

AAA ┗ Â

show aaa group

62.6.1 aaa local authentication attempts

login

aaa local authentication attempts *max-attempts*

max-attempts'	˘ ৸ 1~2147483647 Â

й 3

ৡ Â

ৡ Login

¾ Â

login ˘

Ю '

```
Ruijie# configure terminal
Ruijie(config)# aaa local authentication lockout-time 5
```

¾	
Show running-config	
Show aaa lockout	login

¼

¼	
-	-

62.6.3 aaa new-model

RGOS AAA ┗╖ ˘ ¾ **aaa new-model** AAA Â
¾ **no** AAA ┗ Â

aaa new-model

no aaa new-model

-	-

AAA ┗

¾ Â

¾ AAA ¾˘ AAA ┗˘ **aaa new-model**
AAA ┗ Â AAA˘ ‡ AAA ¾ a ┘ Â

Ю AAA ┗ Â

```
Ruijie(config)# aaa new-model
```

ৡ	
aaa authentication	⊮
aaa authorization	⊮
aaa accounting	⊮

/ı	
-	-

62.6.4 clear aaa local user lockout

clear aaa local user lockout {**all** | **user-name** <*word*>}

<*word*>	ID

ৡ Â

˘ ⊣ ⎍ ≠ ⊣ ⎍

Ю '

```
Ruijie# clear aaa local user lockout all
```

ৡ	
show running-config	
show aaa lockout	login

/ı	
-	-

62.6.5 debug aaa

AAA ┗ Â ३ **no** Â

debug aaa event

no debug aaa event

¾ AAA Â

Ю 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
```

¾	
aaa authentication	ЧЖ
aaa authorization	ЧЖ
aaa accounting	ЧЖ

/I	

˘ Л∪ Â

Ю '

```
Ruijie# show aaa user lockout all
```

३	
show running-config	
show aaa lockout	login

✓

/\	
-	-

63 RADIUS

63.1 RADIUS

63.1.1 ip radius source-interface

radius ˘ ٦ **ip radius source-interface** Â ٦

no RADIUS Â

ip radius source-interface *interface*

no radius source-interface

Interface	radius

radius Â

٦ Â

ѝ radius Ь Э nas ˘ ٨ Л٥ ٦ radius

Â ٦ ip ѝ radius ˘ ٦

П uñÖÂÅ,Ґ@ È,3A¹ Q ¸

ƒ˜°šÅ,F@ ð R@ÚÖÂ ðÂ— #V‡'u²Å,F@ #" •¥ KŠQ(@qV<üd= U0 T*Ñ â"p

63.1.2 radius attribute

radius ttribute{*<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**

id	╖ id <1-255>
type	type

ɻ ʌ '

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

٦	
radius set qos cos	radius Ю qos ѝ cos

٨

٨	
-	-

63.1.3 radius-server deadtime

٨˘ t ˘ ‡ ѝ Ь ˘ t ѝ
ˆ deadtime˜ ˘ RGOS RADIUS ˘ ٦
radius-server deadtime Â ٦ **no** ˘ Â

radius-server deadtime *minnutes*

no radius-server deadtime

minnutes	ˆ Æ ѝ† ˜ Â ٧ ѝ 1-1000 Â

5†

٦ Â

٦ Â

Ю ЊѪ ѝ 10† '
Ruijie(config)# **radius-server deadtime** *10*

RADIUS

radius-server key	RADIUS
radius-server retransmit	RADIUS
radius-server timeout	RADIUS

٦	/ا	
	-	-

63.1.6 radius-server retransmit

ù RADIUS ˙ ˛ ˘ ٦
radius-server retransmit Â ٦ **no** Â

radius-server retransmit *retries*

no radius-server retransmit

	retries	RADIUS Â

ù 3 Â

٦ Â

AAA Ю ˙ ˛ Â
˙ ˛ ˙ RADIUS
˘ Â

Ю ù 4'

```
Ruijie(config)# radius-server retransmit 4
```

٦		
٦	**radius-server host**	ĦX RADIUS ˙ ў
	radius-server key	ĦX RADIUS ٦
	radius-server timeout	ĦX RADIUS

ا

٦	/ا	
	-	-

63.1.7 radius-server timeout

RADIUS L ˘ ぅ

qos ѝ dscp

٦ Â

٦˘ ٦Л Ю qos ѝ cos ˘ ѝ dscp

Ю '

```
Ruijie(config)# radius set qos cos
```

٦	
radius vendor-specific extend	Radius ѝ a ѡ id

٨

٨	
-	-

63.1.9 radius vendor-specific extend

ѝ a ѡ id Â

radius vendor-specific extend

no radius vendor-specific extend

-	-

٦ ٨ id

٦ Â

٦ ٦ id Â

Ю '

```
Ruijie(config)# radius vendor-specific extend
```

٦	٦

radius attribute	/I
radius set	qos cos

/I	
-	-

63.2 RADIUS

63.2.1 debug radius

RADIUS Â ٦ no RADIUS Â

debug radius [**event | detail**]

no debug radius [**event | detail**]

RADIUS ¼ Â

show radius parameter

-	-

¾ Â

¾ radius ¼ Â

```
Ruijie# show radius parameter
Server Timout:   5 Seconds
Server Deadtime: 5 Minutes
Server Retries:  3
Server Key:      ******
```

¾	
radius-server host	¤¾ RADIUS ¼ ÿ
radius-server retransmit	¤¾ RADIUS
radius-server key	¤¾ RADIUS ¾
radius-server timeout	¤¾ RADIUS

¼

¼	
-	-

63.2.3 show radius server

RADIUS ¼ Â

show radius server

-	-

¾ Â

¾ radius ¨ Â

```
Ruijie# show radius server
server ip : 192.168.4.12
acct  port: 23
authen  port: 77
server state: ready
server ip : 192.168.4.13
acct  port: 45
authen  port: 74
server state: ready
```

¾

¾	
radius-server host	¤¾ RADIUS ¨ ÿ
radius-server retransmit	¤¾ RADIUS
radius-server key	¤¾ RADIUS ¾
radius-server timeout	¤¾ RADIUS

¼

¾

¼	
-	-

63.2.4 show radius vendor-specific

RADIUS Â

show radius vendor-specific

-	-

ৡ Â

ৡ radius

-	-

64 TACACS+

64.1 TACACS+

64.1.1 aaa group server tacacs+

ৡ TACACS+ ┗ ˘ a ┛ TACACS+ ┗ ˚ a ┛ Â

aaa group server tacacs+ *group-name*

no aaa group server tacacs+ *group-name*

group-name	TACACS+ ┗ ┛

TACACS+ ┗ Â

ৡ Â

TACACS+ ┗ ˚ ˘ à à ┛Ո a ┛ ┗ Â

Ю ┛ й tac1 TACACS+ ┗ ˘ з 1.1.1.1

TACACS+ ┗ '

```
Ruijie(config)#
```

64.1.2 ip tacacs source-interface

٦ TACACS+ Â

ip tacacs source-interface *interface*

no ip tacacs source-interface

Interface	TACACS+

TACACS+ Â

٦ Â

ŭ TACACS+ Ł Э nas ˘ ˩Л∪ ٦
TACACS+ Â ٦ ip ŭ TACACS+
˘ ٦ Ь Â

Ю TACACS+ ÿ fastEthernet 0/0 ˩ ip ŭ TACACS+
'

```
Ruijie(config)# ip tacacs source-interface fastEthernet 0/0
```

٦

vrf-name	vrf ﻝ

٣ TACACS+ ﻠ Â

ﻯ TACACS+ ﻠ vrf ﻝ Â

Ю ﻯ TACACS+ ﻠ VRF ﻝ ﻯ 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
```

٣	
aaa group server tacacs+	TACACS+ ﻠ
server	TACACS+ ﻠ server

ﻤ

-0 1 Tf6 3T0 1 Tf0.16_0 1 Tf0 Tc 3.024 0 Td0.16_0>Tj-15.144 -1.563 Td< h

¾ ˘ ¾ **aaa group server tacacs+** TACACS+ Â
TACACS+ Ł Ł ˘ Ю **tacacs-server**
host ¾ Ł Â

й Ь a ┘ ˘ host ¦ key ˘
┘Л key Ь key Â

Ю Ьж TACACS+ Ь ¦ й aaa'
Ruijie(config)#**tacacs-server key** *aaa*

¦	
tacacs-server host	Ьж TACACS+ Ь ў
tacacs-server timeout	Ьж TACACS+

┘

Л	
-	-

64.1.7 tacacs-server timeout

¦ б TACACS+ Ь ˘ Ь Â

tacacs-server timeout *seconds*

no tacacs-server timeout

seconds	^ Æ й ~ Â ┘ й 1-1000 Â

5

¦ Â

¦ Â й Ь a ┘
˘ host ¦ timeout ˘ ┘Л
timeout Ь timeout Â

Ю Ьж й 10 '
Ruijie(config)# **tacacs-server timeout** *10*

¦	¦	

tacacs-server host	ÞÝ TACACS+ ¦ ÿ
tacacs-server key	ÞÝ TACACS+ ¾

¼

¾	
-	-

64.2 TACACS+

64.2.1 debug tacacs+

TACACS+ Â ¾ no TACACS+ Â

debug tacacs+

no debug tacacs+

-	-

¾ EXEC Â

¾	
-	-

¼

¾	
-	-

64.2.2 show tacacs

TACACS+ ⊾ Â

show tacacs

-	-

65 SSH

65.1 SSH

65.1.1 crypto key generate

Ł Ὼ ˘ ЮЎ ȝ'

crypto key generate {**rsa | dsa**}

rsa	RSA
dsa	DSA

Ю SSH Server Ὼ Â

ȝ

SSH Server Ł ˘ ȝ SSH Ł Ὼ Â ɹ
enable service ssh-server ȝ˘ SSH Server ╖ ÂSSH 1 RSA ' SSH 2 RSA DSA Â ˘ RSA ˘ ‡ SSH1 б SSH2 ɹ Лυ ' DSA ˘ ‡ SSH2 ɹ Лυ Â

˘ a ȝ **no crypto key generate**˘ ȝ **crypto key zeroize** ȝ Â

```
Ruijie# configure terminal
Ruijie(config)# crypto key generate rsa
```

ȝ	
show ip ssh	SSH Server Â
crypto key zeroize {**rsa	dsa**}	DSA б RSA ˘ SSH Server ╖ Â

ɻ ˚ RGOS10.1 ЛυЭ

ȝ	ɻ	

-	-

65.1.2 crypto key zeroize

SSH Ł Ὼ ˘ ЮЎ ٪'

crypto key zeroize {**rsa** | **dsa**}

rsa	RSA
dsa	DSA

٪

٪ Ł Ὼ Â ˇ SSH Server ѝ ѝ DISABLE Â
SSH Serverě **no enable service ssh-server** ٪ Â

```
Ruijie# configure terminal
Ruijie(config)# crypto key zeroize rsa
```

٪	
show ip ssh	SSH Server Â
crypto key generate {**rsa|dsa**}	DSA б RSA Â

¾

¾ SSH Server Â ÿ ↓ ˘
120s ╖ ˘ ‡ ѝ Â **show ip ssh** ¾ SSH server
Â

ѝ 100s'
```
Ruijie# configure terminal
Ruijie(config)# ip ssh time-out 100
```

¾

¾	
show ip ssh	ssh-server Â

↓ ˚ RGOS10.1 Л Э

¾

Л	
-	-

65.1.5 ip ssh version

SSH server Â ¾ no ѝ Â

ip ssh version {**1** | **2**}

no ip ssh version

1	SSH Server SSH1
2	SSH Server SSH2

Ю SSH 1 2 Â Л˘ ↓ ↓ SSH
Â **no ip ssh version** ¾ ≠ ↓ Л ѝ Â

¾

¾ ⁸ SSH Server SSH Â Ю˘ SSH Server
SSH1 б SSH2˝ SSH 1 SSH 2 ↓ Л Â
1 ˡ SSH

```
Ruijie# configure terminal
Ruijie(config)# ip ssh version 2
```

show ip ssh	SSH Server Â

RGOS10.1 Л Э

	Clear line vty *line_number*	VTY Â

¼	RGOS10.1 Л Э

¾	¼	
	-	-

65.2.2 show crypto key mypubkey

show ip ssh

-	-

SSH Server Â ' à SSH Server à à Â

SSH ˘ Ь ˘ ÿ
SSH й a ┘ Â

```
Ruijie# show ip ssh
```

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

˚ RGOS10.1 Л Э

Л	
-	-

65.2.4 show ssh

SSH Â

show ssh

-	-

?

SSH Â ' ´ VTY /I à SSH à ╗
à à à ⅃ Â

Ruijie# **show ssh**

?

?	
-	-

/I ˚ RGOS10.1 Л∪Э

?

/I	
-	-

CPU

CPU ″I Â

cpu-protect type { **arp** | **bpdu** | **dhcp** | **ipv6mc** | **igmp** | **rip** | **ospf** | **vrrp** | **pim** | **ttl1** | **unknown-ipmc** | **dvmrp** | …} **pri** *pri_num*

pri_num	ID˘ ↓ ѝ 0¯ 7

ѝ 0Â

¾ Â

Ю BPDU 7 '

```
Ruijie(config)# cpu-protect type bpdu pri 7
Set packet type bpdu pri 7.
```

¾	
cpu-protect type packet-type pps *pps_value*	Â

↓

/↑	
-	-

66.2

66.2.1 show cpu-protect mboard

CPU Â

show cpu-protect mboard

-	-

३

slot_num	¼ ½ 1-16 Â

¾ Â

¾ ´ CPP Â

Ю ´ 2 CPU Â

```
Ruijie(config)# show cpu-protect slot 2
Type        Pps      Total    Drop
------------ --------- --------- ---------
```

67 DoS

67.1

67.1.1 ip deny invalid-l4port

¶ Â ¶ **no** ¶ Â

ip deny invalid-l4port

no ip deny invalid-l4port

-	-

Ю ¶ Â

¶ Â

1' Э ¶ '

```
Ruijie(config)# ip deny invalid-l4port
```

2' Э ¶ '

```
Ruijie(config)# no ip deny invalid-l4port
```

¶	
show ip deny invalid-l4port	

-

/I	
-	-

67.1.2 ip deny invalid-tcp

TCP ¶ Â ¾ **no** TCP ¶ Â

ip deny invalid-tcp

no ip deny invalid-tcp

-	-

ЮЎ TCP ¶ Â

¾ Â

1' Э Land ¶ '
```
Ruijie(config)# ip deny land
```
2' Э Land ¶ '
```
Ruijie(config)# no ip deny land
```

¾	
show ip deny land	Land

-

/¼	
-	-

67.2

67.2.1 show ip deny invalid-l4port

Â

show ip deny invalid-l4port

-	-

¾ Â

```
Ruijie# show ip deny invalid-l4port
 DoS Protection Mode                  State
 -------------------------------      -----
```

protect against invalid l4port attack Off

३	
-	-

67.2.3 show ip deny land

Land Â

show ip deny land

-	-

¾ Â

```
Ruijie# show ip deny land
DoS Protection Mode              State
-------------------------------  -----
protect against land attack      On
```

¾	
(**no**) **ip deny land**	Land ¶

/¼	
-	-

68 DAI

68.1 VLAN DAI

68.1.1 ip arp inspection vlan

३˘ ⊣ Л∪ *vlan-id* VLAN DAI ╖ Â ३ no ⊣ Л∪
vlan-id VLAN DAI ╖ ˘ *vlan-id*ď ‡ VLAN
Э DAI ╖ Â

ip arp inspection vlan *vlan-id*

no ip arp inspection vlan [*vlan-id*]

vlan-id	vlan /ו Â

VLAN Э DAI ╖ Â

३ Â

68.2

68.2.1 ip arp inspection trust

γ ↲ ˘ ३ **ip arp inspection trust** Â ३ **no** γ ѝ a Â

ip arp inspection trust

no ip arp inspection trust

-	-

a Â

३ Â

ARP ˚ DAI ˘ ↲ Л ὲ ↲ ˘ a ARP ˘ Â

NFPP( ) ˘ ⁸ NFPP ˘ a ¨Ạ

& DAI ˘ ३ **show ip arp inspection interface** ↲ Â

VLAN DAI ╖ ˘ ɜ ARP γ a ↓ ˘
ARP ‡ ˘ DHCP Snooping .
˘ ‡ ÂDHCP Snooping ê DHCP
Snooping Ì Â

69 IP Source Guard

69.1 IP Source Guard

69.1.1 ip source binding

IP ╗ ˘ **no** Â

[**no**] **ip source binding** *mac-address* **vlan** *vlan-id ip-address* **interface** *interface-id*

mac-address	╗ MAC ’
vlan-id	╗ vlan id’
ip-address	╗ IP ’
interface-id	╗ Â

╗ Â

¾ Â

¾ ┘Л∪ ǂ ┘Л∪ IP Source Guard ˘ a DHCP ⁸ Â

Ю 1 ’

```
Ruijie# configure terminal
Ruijie(config)# ip source binding 0000.0000.0001 vlan 1 1.1.1.1
interface FastEthernet 0/1
Ruijie(config)# end
Ruijie# show ip source binding
MacAddress    IpAddress  Lease(sec)  Type    VLAN  Interface
------------- --------- ----------  ----    ----  ------------
0000.0000.0001 1.1.1.1   infinite   static   1  FastEthernet 0/1
Total number of bindings: 1
```

¾

show ip source binding	IP

३	
-	-

69.2 IP Source Guard

69.2.1 ip verify source

Э IP Source Guard ╖ ˘ **no** ╖ Â

[**no**] **ip verify source** [**port-security**]

port-security	IP Source Guard ╖ IP+MAC Â

Â

Â

३ IP Source Guard ╖ ˘ ⊿Л IP ˘ IP+MAC ’

IP Source Guard ╖ DHCP Snooping Э ˘ ≠ ˘ Trust ЛЬ DHCP Snooping ⁸ Э IP Source Guard ╖ ˘ IP Source Guard ╖ a Â

Ю 1 Э IP Source Guard ╖ ’

```
Ruijie# configure terminal
Ruijie(config)# interface fastEthernet 0/1
Ruijie(config-if)# ip verify source
Ruijie(config-if)# end
```

३	
show ip source binding	IP Source Guard

¾	/\	
	-	-

69.3 IP Source Guard

69.3.1 show ip source binding

¾ IP Â

show ip source binding [*ip-address*] [*mac-address*] [**dhcp-snooping**] [**static**] [**vlan** *vlan-id*] [**interface** *interface-id*]

ip-address	ip '
mac-address	mac '
dhcp-snooping	╟ '
static	'
vlan-id	vlan '
interface-id	Â

Â

¾ Â

Â

Ю '

```
Ruijie# show ip source binding static DBD84140005T Tc 1 T 0 Tl 0.24 20.1 ref296.7 4
```

/I	
-	-

69.3.2 show ip verify source

¾ IP Source Guard

show ip verify source [**interface** *interface-id*]

interface-id	Â

Â

interface IP Source Guard ╖ ˘
ЮО ' "IP source guard is not configured on the interface FastEthernet 0/10" Â
IP Source Guard (**mode**) ЮО'
Â **inactive-no-snooping-vlan** ' DHCP Snooping ⁸ '
Â **inactive-trust-port** ' DHCP Snooping ⁸ Э'
Â **active** ' DHCP Snooping ⁸ Э Â

ЮО '

```
Ruijie # show ip verify source
Interface Filter-type Filter-mode Ip-address Mac-address    VLAN
--------- ----------- ----------- ---------- -------------- ----
FastEthernet 0/3   ip         active      3.3.3.3                    1
FastEthernet 0/3   ip         active      deny-all
FastEthernet 0/4    ip+mac    active       4.4.4.4   0000.0000.0001   1
FastEthernet 0/4    ip+mac    active       deny-all
```

¾	
ip verify source	IP Source Guard ╖ Â

-	-

70 NFPP

70.1

70.1.1 cpu-protect sub-interface {manage|protocol|route} pps

¾ Â

cpu-protect sub-interface {*manage*|*protocol*|*route*} pps *pps_vaule*

٦ ´ ¦ Â

cpu-protect sub-interface {*manage*|*protocol*|*route*} **percent** *percent_vaule*

percent_vaule	¦ ˘ ٧ 1 100

(Manage)´ ă ʁ ¦ ѝ 30˝
(Route)´ ă ʁ ¦ ѝ 25˝
(Protocol)´ ă ʁ ¦ ѝ 45 Â

٦

Ruijie(config)# **cpu-protect sub-interface manage percent** 60

٦	
cpu-protect sub-interface { *manage*	*protocol*	*route* } **pps**	´ ¦

٧

٦

٨	
-	-

70.3 ARP

70.3.1 arp-guard attack-threshold

70.3.2 arp-guard enable

¾ ARP ¶ Â

arp-guard enable

-	-

ARP ¶

NFPP

k¨s6Ñ@

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# arp-guard enable
```

٣ NFPP

Ruijie(config)# **nfpp**
Ruijie(config-nfpp)# **arp-guard isolate-period** 180

٣	
nfpp arp-guard isolate-period	Э
show nfpp arp-guard summary	

ل

٣	
-	-

70.3.4 arp-guard monitor-period

٣ Â

arp-guard monitor-period *seconds*

seconds	˘ Æ ˘ ل [180, 86400] Â

600 Â

٣ NFPP

Â ˘ ѝ Ơ ˚ ˘ ѝ
Â ˚ ˘ ѝ ˘ ╟ ˚
ل ˚ ˘ з ѝ Â ѝ 0 Ю
Ю Â
Â ÿ ˘ ˘ a
˚ Â

Ruijie(config)# **nfpp**

```
Ruijie(config-nfpp)# arp-guard monitor-period 180
```

show nfpp arp-guard summary	
show nfpp arp-guard hosts	
clear nfpp arp-guard hosts	

	show nfpp arp-guard summary	
⁄		
३	⁄	
	-	-

¾	/ı	
	-	-

70.3.7 arp-guard scan-threshold

Â

arp-guard scan-threshold *pkt-cnt*

	pkt-cnt	˘ ↓ [1,9999] Â

15˜ Æ 10 Â

¾ NFPP

10 15 ЛЪЭ ARP ˘ MAC IP ↓ ˘ MAC IP IP a ↓ ˘ ѝ Â

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# arp-guard scan-threshold 20
```

¾	¾	
	nfpp arp-guard scan-threshold	Э
	show nfpp arp-guard summary	
	show nfpp arp-guard scan	ARP
	clear nfpp arp-guard scan	ARP

↓

¾	/ı	
	-	-

70.3.8 clear nfpp arp-guard hosts

↓ ў ˘ ў ˘ Â

clear nfpp arp-guard hosts [**vlan** *vid*] [**interface** *interface-id*] [*ip-address* | *mac-address*]

vid	/ा
interface-id	ɹ
ip-address	IP
mac-address	MAC

३

a ˘ ў Â

VLAN 1 g 0/1 ў Â

```
Ruijie# clear nfpp arp-guard hosts vlan 1 interface g0/1
```

३	
arp-guard attack-threshold	
nfpp arp-guard policy	
show nfpp arp-guard hosts	↓ ў

३

/ा

/ा	
-	-

70.3.9 clear nfpp arp-guard scan

ARP Â

clear nfpp arp-guard scan

-	-

٦

Ruijie# **clear nfpp arp-guard scan**

٦	
arp-guard scan-threshold	
nfpp arp-guard scan-threshold	
show nfpp arp-guard scan	ARP

٦

/I	
-	-

70.3.10 nfpp arp-guard enable

٦ Э ARP ٦ Â

nfpp arp-guard enable

-	-

ARP ˘ Â

٦

ARP ″I ARP Â

Ruijie(config)# **interface G0/1**
Ruijie(config-if)# **nfpp arp-guard enable**

٦	
arp-guard enable	ARP ٦
show nfpp arp-guard summary	

¾	/¶	
	10.4	¾

70.3.11 nfpp arp-guard isolate-period

¾ Э Â

nfpp arp-guard isolate-period {*seconds* | **permanent**}

seconds	˘ Æ ˘ ¶ 0 [30, 86400]˝ 0 a Â
permanent	

Э Â

nfpp arp-guard policy {**per-src-ip** | **per-src-mac** | **per-port**} *rate-limit-pps attack-threshold-pps*

per-src-ip	IP Â
per-src-mac	MAC Â
per-port	Â
rate-limit-pps	˘ ↓ 1 9999 Â
attack-threshold-pps	˘ ↓ 1 9999 Â

˘ Â

ʒ

a Â

```
Ruijie(config)# interface G 0/1
Ruijie(config-if)# nfpp arp-guard policy per-src-ip 2 10
Ruijie(config-if)# nfpp arp-guard policy per-src-mac 3 10
Ruijie(config-if)# nfpp arp-guard policy per-port 50 100
```

ʒ

ʒ	
arp-guard attack-threshold	
arp-guard rate-limit	
show nfpp arp-guard summary	
show nfpp arp-guard hosts	↓ ў
clear nfpp arp-guard hosts	ў

↓

ʒ

/ı	
10.4	ʒ

70.3.13 nfpp arp-guard scan-threshold

Э Â

nfpp arp-guard scan-threshold *pkt-cnt*

pkt-cnt	˘ ↓ [1,9999] Â

ARP ˘ ARP Â

३

```
Ruijie(config)# interface G 0/1
Ruijie(config-if)# nfpp arp-guard scan-threshold 20
```

	pps	˘ Æ ˘ ↓ [1,9999] Â
	MAC	10 ˘ 300 Â
¾	NFPP	

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# dhcp-guard attack-threshold per-src-mac 15
Ruijie(config-nfpp)# dhcp-guard attack-threshold per-port 200
```

¾	
nfpp dhcp-guard policy	
show nfpp dhcp-guard summary	
show nfpp dhcp-guard hosts	↓ ÿ
clear nfpp dhcp-guard hosts	↓ ÿ

¾	/I
-	-

70.4.2 dhcp-guard enable

¾ DHCP ╖ Â

dhcp-guard enable

-	-

DHCP ˘ Â

¾	NFPP

Ruijie(config)# **nfpp**
Ruijie(config-nfpp)# **dhcp-guard enable**

३	
nffp dhcp-guard enable	Э DHCP ℼ
show nfpp dhcp-guard summary	

/ſ	
-	-

70.4.3 dhcp-guard isolate-period

३ Â

dhcp-guard isolate-period {*seconds* | **permanent**}

seconds	˘ Æ ˘ ﻯ 0 [30, 86400]ˇ 0 a Â
permanent	

0ˇ a Â

३ NFPP

ſ ﻯ ˆ ˜ Â
˘ ˘ ﻯ , ‡ˇ
Â

Ruijie(config)# **nfpp**
Ruijie(config-nfpp)# **dhcp-guard isolate timeout** *180*

३	
nfpp dhcp-guard isolate-period	Э

show nfpp dhcp-guard summary	

¶

¾	
¶	
-	-

70.4.4 dhcp-guard monitor-period

¾ Â

dhcp-guard monitor- period *seconds*

seconds	˘ Æ ˘ ¶ [180, 86400] Â

600 Â

¾ NFPP

Â ˘ ù Ơ ˚ ˘ ù
Â ˚ ˘ ù ˘ ╟ ˚
¶ ˚ ˘ з ù Â ù 0 Ю
Ђ Â
Â ÿ ˘ ˘ a
˚ Â

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# dhcp-guard monitor-period 180
```

¾	
show nfpp dhcp-guard summary	
show nfpp dhcp-guard hosts	¶ ў
clear nfpp dhcp-guard hosts	ў

¶

¾	
¶	

	-	-

70.4.5 dhcp-guard monitored-host-limit

ʒ ↓ ў Â

dhcp-guard monitored-host-limit *number*

	number	↓ ў ˘ ↓ й 1 4294967295

↓ ў й 1000

ʒ NFPP

↓ ў 1000 ˘

dhcp-guard rate-limit { **per-src-mac** | **per-port**} *pps*

per-src-mac	MAC
per-port	
pps	˘ ↓ [1,9999] Â

MAC 5 ˘ 150 Â

¾ NFPP

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# dhcp-guard rate-limit per-src-mac 8
Ruijie(config-nfpp)# dhcp-guard rate-limit per-port 100
```

¾	
nfpp dhcp-guard policy	
show nfpp dhcp-guard summary	

↓

/↑	
-	-

70.4.7 clear nfpp dhcp-guard hosts

˘ Â

clear nfpp dhcp-guard hosts [*vlan vid*] [**interface** *interface-id*] [*mac-address*]

vid	/↑
interface-id	↓

३	

70.4.10 nfpp dhcp-guard policy

Э Â

nfpp dhcp-guard policy { **per-src-mac** | **per-port**} *rate-limit-pps attack-threshold-pps*

per-src-mac

70.5.1 dhcpv6-guard attack-threshold

˘ ˘ ѝ ѝ Â

dhcpv6-guard attack-threshold { **per-src-mac** | **per-port**} *pps*

per-src-mac	MAC Â
per-port	Â

pps

-	-

DHCPv6 ˘ Â

٣ NFPP

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# dhcpv6-guard enable
```

٣	
nffp dhcpv6-guard enable	Э DHCPv6 ٦
show nfpp dhcpv6-guard summary	

٨

٨	
10.4	٣

70.5.3 dhcpv6-guard isolate-period

٣ Â

dhcpv6-guard isolate-period {*seconds* | **permanent**}

seconds	˘ Æ ˘ ٨ 0 [30, 86400] 0 a Â
permanent	

0 a Â

٣ NFPP

† ѝ ˆ ˜ Â

˘ Bue ¿

Ruijie(config)# **nfpp**
Ruijie(config-nfpp)# **dhcpv6-guard isolate timeout** *180*

¾	
nfpp dhcpv6-guard isolate-period	Э
show nfpp dhcpv6-guard summary	

¼

¼	
10.4	¾

70.5.4 dhcpv6-guard monitor-period

¾ Â

३	
show nfpp dhcpv6-guard summary	
show nfpp dhcpv6-guard hosts	↓ ў
clear nfpp dhcpv6-guard hosts	ў

↓

/!	
10.4	३

70.5.5 dhcpv6-guard monitored-host-limit

३ ↓ ў Â

dhcpv6-guard monitored-host-limit *number*

number	↓ ў ˘ ↓ и 1 4294967295

↓ ў и 1000

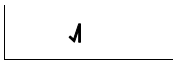
NFPP

↓ ў 1000 ˘ ↓ ў 1000ˆ a ↓ ў ˘ ľ %ERROR' The value that you configured is smaller than current monitored hosts 1000ˆ ↓ ў ~ ˘ please clear a part of monitored hosts. Ł ˘ ĺ ў Â

↓ ў ˘ ľ % NFPP_DHCP_GUARD-4-SESSION_LIMIT: Attempt to exceed limit of 1000ˆ ↓ ў ~ monitored hosts. Ł Â

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# dhcp-guard monitored-host-limit 200
```

३	
show nfpp dhcpv6-guard summary	



˘ Â

clear nfpp dhcpv6-guard hosts [*vlan vid*] [**interface** *interface-id*] [*mac-address*]

vid	/ʃ
interface-id	ɹ
mac-address	MAC

ʒ

a ˘ Â

VLAN 1 g 0/1 Â

```
Ruijie# clear nfpp dhcpv6-guard hosts vlan 1 interface g0/1
```

ʒ

ʒ	
dhcpv6-guard attack-threshold	
nfpp dhcpv6-guard policy	
show nfpp dhcpv6-guard hosts	ў

ʃ

ʒ

ʃ	
10.4	ʒ

¾

DHCPv6 ¨I DHCP Â

```
Ruijie(config)# interface G0/1
Ruijie(config-if)# nfpp dhcpv6-guard enable
```

¾	
dhcpv6-guard enable	DHCPv6 ¶
show nfpp dhcpv6-guard summary	

¼

¼	
10.4	¾

70.5.9 nfpp dhcpv6-guard isolate-period

¾ Э Â

nfpp dhcpv6-guard isolate-period {*seconds* | **permanent**}

seconds	˘ Æ ˘ ¼ 0 [30, 86400]˜ 0 a Â
permanent	

˘ Â

¾

```
Ruijie(config)# interface G 0/1
Ruijie(config-if)# nfpp dhcpv6-guard isolate-period 180
```

¾	¾	

dhcpv6-guard isolate-period	
show nfpp dhcpv6-guard summary	

ʃ

ʃ	
10.4	ʒ

70.5.10 nfpp dhcpv6-guard policy

Э Â

nfpp dhcpv6-guard policy { **per-src-mac** | **per-port**} *rate-limit-pps attack-threshold-pps*

per-src-mac	MAC Â
per-port	Â
rate-limit-pps	˘ ɹ 1 9999 Â
attack-threshold-pps	˘ ɹ 1 9999 Â

˘ Â

ʒ

a Â

```
Ruijie(config)# interface G 0/1
Ruijie(config-if)# nfpp dhcpv6-guard policy per-src-mac c 08
Ruijie(config-if)# nfpp dhcpv6-guard policy per-port 50 108
```

ʒ

ʒ	
dhcpv6-guard attack-threshold	
dhcpv6-guard rate-limit	
show nfpp dhcpv6-guard summary	
show nfpp dhcpv6-guard hosts	ɹ ў
clear nfpp dhcpv6-guard hosts	ў

¾	¼
10.4	¾

70.6 ICMP

70.6.1 icmp-guard attack-threshold

˘ ˘ ¸ ¸ Â

icmp-guard attack-threshold { **per-src-ip** | **per-port**} *pps*

per-src-ip	IP Â
per-port	Â
pps	˘ Æ ˘ ¼ [1,9999] Â

IP 1200 ˘ 1500 Â

¾ NFPP

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# icmp-guard attack-threshold per-src-ip 600
Ruijie(config-nfpp)# icmp-guard attack-threshold per-port 1200
```

¾ NFPP	

˘ Æ ˘ ˬ 0 [30, 86400˽

seconds

Â ˚ ˘ ѝ ˘ ╟ ˚
Ↄ ˚ ˘ з ѝ Â ѝ 0 Ю
ЊЖ Â
Â ÿ ˘ ˘ a
˚ Â

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# icmp-guard monitor-period 180
```

ʒ

ʒ	
show nfpp icmp-guard summary	
show nfpp icmp-guard hosts	Ↄ ў
clear nfpp icmp-guard hosts	ў

Ↄ

ʒ

Л	
-	-

70.6.5 icmp-guard monitored-host-limit

ʒ Ↄ ў Â

icmp-guard monitored-host-limit *number*

number	Ↄ ў ˘ Ↄ ѝ 1 4294967295

Ↄ ў ѝ 1000 Â

ʒ NFPP

Ↄ ў 1000 ˘ Ↄ ў
1000ˆ a Ↄ ў ˘ ľ %ERROR' The value that you configured is smaller than current monitored hosts 1000ˆ Ↄ ў ~ ˘ please clear a part of monitored hosts. Ł ˘ ť
ў Â
Ↄ ў ˘ ľ % NFPP_ICMP_GUARD-4-SESSION_LIMIT: Attempt to

exceed limit of 1000 monitored hosts.

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# icmp-guard monitored-host-limit 200
```

show nfpp icmp-guard summary	

-	-

70.6.6 icmp-guard rate-limit

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ȝ	ȷ	
	-	-

70.6.7 icmp-guard trusted-host

a ȷ ў Â

icmp-guard trusted-host *ip mask*

no icmp-guard trusted-host {**all |** *ip mask*}

ip	IP
mask	IP
all	no ˘ ȷ ў

ȷ ў Â

ȝ NFPP

ȷ ў a ˘ ў ˘ ‡ ȷ Л ȝ Â
ȷ ў CPU ICMP CPU a Â
ȷ Л ў a Â
500 ȷ ў Â

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# icmp-guard trusted-host 1.1.1.0 255.255.255.0
```

ȝ	
show nfpp icmp-guard trusted-host	

ȷ

ȝ	ȷ	
	-	-

70.6.8 clear nfpp icmp-guard hosts

ɻ ў ˘ ў ˘ Â

clear nfpp icmp-guard hosts [*vlan vid*] [**interface** *interface-id*] [*ip-address*]

ICMP ˘ Â

¾

ICMP ¨I ICMP Â

```
Ruijie(config)# interface G0/1
Ruijie(config-if)# nfpp icmp-guard enable
```

¾

¾	
icmp-guard enable	ICMP ¶
show nfpp icmp-guard summary	

¼

¾

¼	
10.4	¾

70.6.10 nfpp icmp-guard isolate-period

¾ Э Â

nfpp icmp-guard isolate-period {*seconds* | **permanent**}

seconds	˘ Æ ˘ ¼ 0 [30, 86400]˜ 0 a Â
permanent	

˘ Â

¾

```
Ruijie(config)# interface G 0/1
Ruijie(config-if)# nfpp icmp-guard isolate-period 180
```

३	
icmp-guard isolate-period	
show nfpp icmp-guard summary	

⁄ı	
10.4	३

70.6.11 nfpp icmp-guard policy

Э Â

nfpp icmp-guard policy { **per-src-ip** | **per-port**} *rate-limit-pps attack-threshold-pps*

per-src-ip	IP Â
per-port	Â
rate-limit-pps	˘ ↓ 1 9999 Â
attack-threshold-pps	˘ ↓ 1 9999 Â

˘ Â

a Â

```
Ruijie(config)# interface G 0/1
Ruijie(config-if)# nfpp icmp-guard policy per-src-ip 5 10
Ruijie(config-if)# nfpp icmp-guard policy per-port 100 200
```

३	
icmp-guard attack-threshold	
icmp-guard rate-limit	
show nfpp icmp-guard summary	
show nfpp icmp-guard hosts	↓ ў

show nfpp ip-guard hosts	৸ ў
clear nfpp ip-guard hosts	ў

৸

ৡ	
10.4	ৡ

70.7.2 ip-guard enable

ৡ IP ╖ Â

ip-guard enable

-	-

IP ╖ ৳

¾ Â

ip-guard isolate-period {*seconds* | **permanent**}

seconds	˘ Æ ˘ ˇ 0 [30, 86400] Â
permanent	

0˝ a Â

¾ NFPP

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# ip-guard isolate-period 180
```

¾	
nfpp ip-guard isolate-period	Э
show nfpp ip-guard summary	

ˇ

/ˇ	
10.4	¾

70.7.4 ip-guard monitor-period

¾ Â

ip-guard monitor-period *seconds*

seconds	˘ Æ ˘ ˇ [180, 86400] Â

600 Â

¾ NFPP

Â ˘ ѝ Ơ ˚ ˘ ѝ
Â ˚ ˘ ѝ ˘ ╟ ˚
ы ˚ ˘ з ѝ Â ѝ 0

ˬ ў ˘ ľ % NFPP_IP_GUARD-4-SESSION_LIMIT: Attempt to exceed limit of 1000ˆ ˬ ў ˜ monitored hosts. Ł Â

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# ip-guard monitored-host-limit 200
```

ȝ

ȝ	
show nfpp ip-guard summary	

ʌ

ȝ

ʌ	
10.4	ȝ

70.7.6 ip-guard rate-limit

Â

ip-guard rate-limit {per-src-ip | per-port} *pps*

per-src-ip	IP
per-port	
pps	˘ ˬ [1,9999] Â

IP 20 ˘ 100 Â

ȝ NFPP

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# ip-guard rate-limit per-src-ip 2
Ruijie(config-nfpp)# ip-guard rate-limit per-port 50
```

show nfpp ip-guard summary	

٦	
10.4	٦

70.7.7 ip-guard scan-threshold

Â

ip-guard scan-threshold *pkt-cnt*

pkt-cnt	[1,9999] Â

10 100 Â

NFPP

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# ip-guard scan-threshold 20
```

٦	
nfpp ip-guard scan-threshold	Э
show nfpp ip-guard summary	

٦	
10.4	٦

70.7.8 ip-guard trusted-host

a ŭ ŭ ŭ ‡ Л ٦ Â

ip-guard trusted-host *ip mask*

no ip-guard trusted-host {**all** | *ip mask*}

ip	IP
mask	IP
all	no ˘ ٦ ў

٦ NFPP

٦ ў a ˘ ў ˘ ‡ ٦ Л Ъ ٦ Â
٦ ў CPU IP CPU a Â
500 ٦ ў Â

1.1.1.0/24 ў й ٦ ў Â

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)#ip-guard trusted-host 1.1.1.0 255.255.255.0
```

٦

٦	
show nfpp ip-guard trusted-hosts	٦ ў

٨

٦

٨	
10.4	٦

70.7.9 clear nfpp ip-guard hosts

٦ ў ˘ ў ˘ Â

clear nfpp ip-guard hosts [**vlan** *vid*] [**interface** *interface-id*] [*ip-address*]

vid	٨
interface-id	٦
ip-address	IP

ʒ

a ˘ ў Â

VLAN 1 g 0/1 ў Â

```
Ruijie# clear nfpp ip-guard hosts vlan 1 interface g0/1
```

ʒ

¾		
¾	**ip-guard enable**	IP ¶
	show nfpp ip-guard summary	

¼

¾	¼	
	10.4	¾

70.7.11 nfpp ip-guard isolate-period

¾ Э Â

nfpp ip-guard isolate-period {*seconds* | **permanent**}

seconds	˘ Æ ˘ ¼ 0 [30, 86400˘ 0 a Â
permanent	

˘ Â

¾

Ruijie(config)# **interface** *G 0/1*
Ruijie(config-if)# **nfpp ip-guard isolate-period** 180

¾		
¾	**ip-guard isolate-period**	
	show nfpp ip-guard summary	

¼

¾	¼	
	10.4	¾

70.7.12 nfpp ip-guard policy

nfpp ip-guard scan-threshold *pkt-cnt*

pkt-cnt	˘ ¼ [1,9999] Â

IP ˘ ARP Â

¾

```
Ruijie(config)# interface G 0/1
Ruijie(config-if)# nfpp ip-guard scan-threshold 20
```

¾	
ip-guard scan-threshold	
show nfpp ip-guard summary	

¼

¼	
10.4	¾

70.8 ND

70.8.1 nd-guard attack-threshold

˘ ˘ и и Â

nd-guard attack-threshold per-port {**ns-na**

/Ω 30 ˘

30

show nfpp nd-guard summary	

¼

¾	
¼	¾
10.4	¾

70.8.4 nfpp nd-guard enable

¾ Э ND ¶ Â

nfpp nd-guard enable

-	-

ND ˘ Â

¾

ND ¨I Â

```
Ruijie(config)# interface G0/1
Ruijie(config-if)# nfpp nd-guard enable
```

¾	
nd-guard enable	ND ¶
show nfpp nd-guard summary	

¼

¾	
¼	¾
10.4	¾

70.8.5 nfpp nd-guard policy

Э Â

nfpp nd-guard policy per-port {**ns-na** | **rs** | **ra-redirect**} *rate-limit-pps attack-thresh old-pps*

ns-na	Ὼ
rs	
ra-redirect	Ὼ
rate-limit-pps	ˇ ↊ 1 9999 Â
attack-threshold-pps	ˇ ↊ 1 9999 Â

ˇ Â

३

a Â

ND snooping ˦ ѝ ˇ ў ˇ
Â ˇ Л
ˇ ND snooping ╖ ˇ ˇ ND snooping
ND guard Ь 800 ˇ
900 Â
ND guard ↊ ND snooping ˇ ↋
ˮI ˇ з ˚ Â ND snooping Â

```
Ruijie(config)# interface G 0/1
Ruijie(config-if)# nfpp nd-guard policy per-port ns-na 50 100
Ruijie(config-if)# nfpp nd-guard policy per-port rs 10 20
Ruijie(config-if)# nfpp nd-guard policy per-port ra-redirect 10 20
```

३	
nd-guard attack-threshold	
nd-guard rate-limit	
show nfpp nd-guard summary	

३

↋

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↋	

10.4	ৡ

70.9 NFPP

70.9.1 clear nfpp log

NFPP ă ʁ Â

clear nfpp log

-	-

ৡ

Ruijie# **clear nfpp log**
32 log-buffer entries were cleared.

ৡ	
show nfpp log	NFPP ă ʁ

ৗ

ৗ	
10.4	ৡ

70.9.2 log-buffer entries

NFPP ă ʁ Â

log-buffer entries *number*

	number	ă ʁ ˘ Æ ˘ ˬ [0,1024]

ă ʁ ѝ 256 Â

ʒ NFPP

NFPP ă ʁ ѝ 50 Â

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# log-buffer entries 50
```

ʒ

ʒ	
log-buffer logs number_of_message **interval** length_in_seconds	NFPP ÿ ă ʁ ˬ Â
show nfpp log	NFPP ă ʁ

ˬ

ʒ

ʃ	
10.4	ʒ

70.9.3 log-buffer logs

NFPP ÿ ă ʁ ˬ Â

log-buffer logs *number_of_message* **interval** *length_in_seconds*

number_of_message	ѝ 0-1024ˇ 0 ж ă ʁˇ a Â
length_in_seconds	ѝ 0-86400ˆ 1 ˜ ˘ 0 a ă ʁˇ Â number_of_message length_in_seconds ѝ 0 a ă ʁˇ Â number_of_message /length_in_second ˬ Â

number_of_message ѝ 1˜ *length_in_seconds* ѝ 30 Â

३ NFPP

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# log-buffer logs 2 interval 12
```

३

३	
log-buffer entries *number*	NFPP ă ѡ Â
show nfpp log summary	NFPP ă ѡ Â

Ѵ

३

Ѵ	
10.4	३

70.9.4 logging

NFPP VLAN Â

logging vlan *vlan-range*

logging interface *interface-id*

vlan-range	VLAN ˘ Ґ 1-3,5 Ł Â
interface-id	Â

Â

३ NFPP

३ ѧ Л∪ ˘ ѧ VLAN Â ч ˘ ѧ è ‡˘ ă ѡ Â

ɻ VLAN 1 à VLAN 2 à VLAN 3 VLAN 5 ˇ ƗƠ

```
Ruijie(config)# nfpp
Ruijie(config-nfpp)# logging vlan
```

NFPP Â

```
Ruijie#show nfpp log summary
Total log buffer size : 10
Syslog rate : 1 entry per 2 seconds
Logging:
  VLAN  1-3, 5
  interface Gi 0/1
  interface Gi 0/2
```

NFPP

Â RS ND ~

Â RA-REDIRECT ND Ω ~

Reason ˘ 5 ٧ '

Â DoS Ł

Â ISOLATED ˚ ٦

Â ISOLATE_FAILED

Â SCAN

Â PORT_ATTACKED

٦	
clear nfpp log	NFPP ά ш

٧

٨	
10.4	٦

70.10 ARP

70.10.1 show nfpp arp-guard hosts

٧ ў Â

show nfpp arp-guard hosts [**statistics** | [[*vlan vid*] [**interface** *interface-id*] [*ip-address* | *mac-address*]]]

statistics	٧ ў
vid	٨
interface-id	١
ip-address	IP
mac-address	MAC

३

1' ↓ ў Â

```
Ruijie# show nfpp arp-guard hosts statistics
success   fail   total
-------   ----   -----
100       20      120
```

120 ↓ ў ˘ è 100 ↓ ў ˚ ˘ 20 ↓ ў ˚
ˆ a ˘ ˚ a ~ Â

2' ↓ ў ˘ l' remain-time(seconds) L ⅓ Â

```
Ruijie# show nfpp arp-guard hosts
If column 1 shows '*', it means "hardware do not isolate user" .
VLAN  interface IP address   MAC address     remain-time(s)
----  --------  ---------    -----------     -------------
1     Gi0/1     1.1.1.1      -               110
2     Gi0/2     1.1.2.1      -               61
*3    Gi0/3     -            0000.0000.1111  110
4     Gi0/4     -            0000.0000.2222  61
Total' 4 hosts
```

३

३	
clear nfpp arp-guard hosts	↓ ў

↓

vid	/ा
interface-id	ɹ
ip-address	IP
mac-address	MAC

३

```
Ruijie# show nfpp arp-guard scan statistics
ARP scan table has 4 record(s).
```

' ľ ARP 4 Ŀ Â

```
Ruijie# show nfpp arp-guard scan
VLAN    interface   IP address   MAC address      timestamp
----    --------    ----------  -----------      ----------
1       Gi0/1       N/A         0000.0000.0001   2008-01-23
16:23:10
2       Gi0/2       1.1.1.1     0000.0000.0002   2008-01-23
16:24:10
3       Gi0/3       N/A         0000.0000.0003   2008-01-23
16:25:10
4       Gi0/4       N/A         0000.0000.0004   2008-01-23
16:26:10
Totalˈ 4 record(s)
```

ľ timestamp Ŀ ARP ˘ ľ 2008-01-23 16:23:10 Ŀ
2008 1 23 16 23† 10 ARP Â

```
Ruijie# show nfpp arp-guard scan vlan 1 interface G 0/1
0000.0000.0001
VLAN    interface   IP address   MAC address      timestamp
----    --------    ----------    -----------      ----------
1       Gi0/1       N/A          0000.0000.0001   2008-01-23
16:23:10
Totalˈ 1 record(s)
```

arp-guard scan-threshold	
nfpp arp-guard scan-threshold	
clear nfpp arp-guard scan	ARP

-

70.10.3 show nfpp arp-guard summary

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show nfpp arp-guard summary

-	-

ˆ 3˜ Rate-limit ѝˆ IP / MAC
/ ˜ ˘ Attack-threshold Â Ľ - Ł
Â

٩	
arp-guard attack-threshold	
arp-guard enable	ARP ╖
arp-guard isolate-period	
arp-guard monitor-period	
arp-guard monitored-host-limit	↓ ў
arp-guard rate-limit	
arp-guard scan-threshold	
enable	Э ARP ╖
isolate-period	
policy	

ʒ

↓ ў Â

Ruijie# **show nfpp dhcp-guard hosts statistics**

success fail total

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

100 20 120

120

-	-

३

३ ↓Л∪ Â

```
Ruijie# show nfpp dhcp-guard summary
ˆ Format of column Rate-limit and  Attack-threshold is per-src-ip
/per-src-mac/per-port.˜
Interface  Status  Isolate-period Rate-limit Attack-threshold
Global     Enable  300            -/5/150    -/10/300
Gi 0/1      Enable  180            -/6/-      -/8/-
Gi 0/2      Disable 200            -/5/30     -/10/50

Maximum count of monitored hosts: 1000
Monitor period  300s
```

ˆ 1˜ Interface и Global Â

ˆ 2˜ Status ╗ Â

ˆ 3˜ Rate-limit й IP / MAC / ˜ ˇ Attack-threshold Â ľ - Ł Â

३	
dhcp-guard attack-threshold	
dhcp-guard enable	DHCP ╗
dhcp-guard isolate-period	
dhcp-guard monitor-period	
dhcp-guard monitored-host-limit	↓ ў
dhcp-guard rate-limit	
nfpp dhcp-guard enable	Э DHCP ╗
nfpp dhcp-guard isolate-period	
nfpp dhcp-guard policy	

10.4	

70.12 DHCPv6

70.12.1 show nfpp dhcpv6-guard hosts

show nfpp dhcpv6-guard hosts [**statistics** | [[**vlan** *vid*] [**interface** *interface-id*] [*mac-address*]]]

statistics	
vid	
interface-id	
mac-address	MAC

VLAN interface MAC address remain-time(seconds)
---- --------- ----------- ------------------
1 gi0/2 0000.0000.0001 10
*2 gi0/1 0000.0000.0002 20
Total‛ 2 host(s)

ৡ	
clear nfpp dhcpv6-guard hosts	↓ ў

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10.4	ৡ

70.12.2 show nfpp dhcpv6-guard summary

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show nfpp dhcpv6-guard summary

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```
Ruijie# show nfpp dhcpv6-guard summary
ˆ Format of column Rate-limit and  Attack-threshold is per-src-ip
/per-src-mac/per-port.˜
Interface  Status  Isolate-period Rate-limit Attack-threshold
Global     Enable  300            -/5/150    -/10/300
Gi 0/1      Enable  180            -/6/-      -/8/-
Gi 0/2      Disable 200            -/5/30     -/10/50

Maximum count of monitored hosts: 1000
```

Monitor period: 300s

1) Interface Global
2) Status
3) Rate-limit IP / MAC / Attack-threshold

dhcpv6-guard attack-threshold	
dhcpv6-guard enable	DHCPv6
dhcpv6-guard isolate-period	
dhcpv6-guard monitor-period	
dhcpv6-guard monitored-host-limit	
dhcpv6-guard rate-limit	
nfpp dhcpv6-guard enable	DHCPv6
nfpp dhcpv6-guard isolate-period	
nfpp dhcpv6-guard policy	

10.4	

interface-id	
ip-address	IP

Ruijie#**show nfpp icmp-guard hosts statistics**

success fail total

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

100 20 120

120

-	-

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Ruijie# show nfpp icmp-guard summary

ˆ Format of column Rate-limit and Attack-threshold is per-src-ip /per-src-mac/per-port.˜

Interface	**Status**	**Isolate-period**	**Rate-limit**	**Attack-threshold**
Global	Enable	300	4/-/60	8/-/100
Gi 0/1	Enable	180	5/-/-	8/-/-
Gi 0/2	Disable	200	4/-/60	8/-/100

Maximum count of monitored hosts: 1000

Monitor period՝ 300s

ˆ 1˜ Interface ѝ Global Â

ˆ 2˜ Status ℸ Â

ˆ 3˜ Rate-limit ѝˆ IP / MAC / ˜ ˇ Attack-threshold Â ľ - Ł Â

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10.4	٣

70.13.3 show nfpp icmp-guard trusted-host

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show nfpp icmp-guard trusted-host

-	-

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ل ÿ Â

```
Ruijie# show nfpp icmp-guard trusted-host
```

70.14 IP

70.14.1 show nfpp ip-guard hosts

৶ ў Â

show nfpp ip-guard hosts [**statistics** | [[**vlan** *vid*] [**interface** *interface-id*] [*ip-addres s*]]]

statistics	৶ ў
vid	৸
interface-id	৷
ip-address	IP

ৡ

Ruijie#**show nfpp ip-guard hosts statistics**

success fail total

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

100 20 120

' ľ 120 ৸ ў ˘ è 100 ৸ ў ╖˘ 20 ৸ ў Ŀ Â

Ruijie#**show nfpp ip-guard hosts**

If column 1 shows '*', it means "hardware do not isolate host" .

VLAN interface IP address Reason remain-time(s)

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

1 Gi0/1 1.1.1.1 ATTACK 110

2 Gi0/2 1.1.2.1 SCAN 61

Total' *n023 T 9CD0Total(K)220.2196>T053.683 0 Td[<47219A34556<-09C4>6<040F1D0<350Ɛm[97*

	clear nfpp ip-guard hosts	↓ ў

↓		

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	10.4	ȝ

70.14.2 show nfpp ip-guard summary

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show nfpp ip-guard summary

ip-guard attack-threshold	
ip-guard enable	IP
ip-guard isolate-period	
ip-guard monitor-period	
ip-guard monitored-host-limit	
ip-guard rate-limit	
nfpp ip-guard enable	IP
nfpp ip-guard isolate-period	
nfpp ip-guard policy	

1.1.2.0 255.255.255.0

Total' 2 record(s)

ৡ	
ip-guard trusted-host	a ৶ ў

৶

৶	
10.4	ৡ

70.15 ND

70.15.1 show nfpp nd-guard summary

Â

show nfpp nd-guard summary

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Ruijie# **show nfpp nd-guard summary**

ˆ Format of column Rate-limit and Attack-threshold is NS-NA/RS/RA-REDIRECT.˜

Interface Status Rate-limit Attack-threshold

Global Enable 20/5/10 40/10/20

Gi 0/1 Enable 15/15/15 30/30/30

Gi 0/2 Disable -/5/30 -/10/50

'

ˆ 1˜ Interface и Global Â

ˆ 2˜ Status ٦ Â

ˆ 3˜ Rate-limit ٭ /Ω /

/ Ω / ˜˘ Attack-threshold Â

Ի - Ł Â

' Ի -/5/30 Ł G 0/2 Э /Ω ˘

5˝ Ω / 30 Â

٦

٦	
nd-guard attack-threshold	
nd-guard enable	ND ٦
nd-guard rate-limit	
nfpp nd-guard enable	Э ND ٦
nfpp nd-guard policy	

٨

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10.4	٦

71 ACL

ЛЬЮ ꝛ ⊣ ЛЬЮ ꝛ

	Ⱨ
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 ⅄
sn	ACL /ſ (˝I)
start-sn	/ſ
inc-sn	/ſ
deny	ꓶ ˘ ‡
permit	ꓶ ˘ ‡
prot	/ſ˘ IPv6 ⊣ ѝ ipv6 icmp˘ tcp˘ udp 0-255 IPv4 ⊣Л eigrp˘ gre˘ ipinip˘ igmp˘ nos˘ ospf icmp˘ udp˘ tcp˘ ip ˘ ≠ ⊣Л ꝛ IP 0-255 /ſ˘ icmp/tcp/udp
interface idx	ꓶ
src	ˆ ў ~
src-wildcard	Â ⊣Л a ˘ 0.255.0.32

src-ipv6-pc 394.98 0.480dx 1sG!0Ѝ0E4Ѓ,X

precedence precedence	″I ˆ 0-7˜
range	/ﾊ
time-range tm-rng-name	Ꮗ˘ ɻ ﾍ tm-rng-name
tos tos	Ꮮ 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 ﾍ ˆ lt- ˘ eq- ˘ gt- ˘ neq- a ˘ range- ˜ port /ﾊ˘ γ ч /ﾊ ˘ è ﾈ /ﾊ
src-mac-addr	ў
dst-mac-addr	ў
VID vid	vlan id
VID inner vid	tag vid
ethernet-type	Ⅱ ˘ ﾈ Ⅱ 0x
match-all tcpf	ﾇ tcp flag Æ
text	
in	
out	ÿ
{rule mask offset}+	rule Ὼ ⁸ ˘ mask Ὼ ⁸ offset ﾍ ˘ ﾈ “+” /ﾊ

ﾛ'

AA AA AA AA AA AA BB BB BB BB BB BB CC CC DD DD

DD DD EE FF GG HH HH HH II II JJ KK LL LL MM MM

NN NN OO PP QQ QQ RR RR RR RR SS SS SS SS TT TT

UU UU VV VV VV VV WW WW WW WW XY ZZ aa aa bb bb

ﾛ

	ﾐ			ﾐ	
A	MAC	0	O	TTL	34

	B	MAC	6	P	/I	35
	C		12	Q	IP	36
	D	VLAN tag	14	R	ip	38
	E	DSAP(ʟ)	18	S	ip	42
	F	SSAP(ʟ)	19	T	TCP	46
	G	Ctrl	20	U	TCP	48
	H	Org Code	21	V	/I	50
	I		24	W		54
	J	IP /I	26	XY	IP Æ	58
	K	TOS	27	Z	Æ flags Æ	59
	L	IP	28	a	Windows size	60
	M	ID /I	30	b	ὲ	62
	N	Flags	32			

Э SNAP¯ tag 802.3 Â

71.1

71.1.1 access-list

ʒ… ‡˘ Â ʒ **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**] [**range** *lower upper*] [**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*][**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**] [**range** *lower upper*] [**time-range** *time-range-name*]

Â Ѧ Ethernet-type cos '

access-list *id* {**deny** | **permit**} {*ethernet-type*| **cos** [*out*][**inner** *in*]} [**VID** [*out*][**inner** *in*]] {**s***ource 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*]

Â Protocol '

access-list *id* {**deny** | **permit**} **protocol** [**VID** [*out*][**inner** *in*]] {*source source-wildcard* | **host** *source* | **any**} {**host** *source-mac-address* | **any** }{*destination destination-wildcard* | **host** *destination* | **any**} {**host** *destination-mac-address* | **any**} [**precedence** *precedence*] [**tos** *tos*] [**fragments**] [**range** *lower upper*] [**time-range** *time-range-name*]

Â Expert '

Internet Control Message Protocol (ICMP)'

access-list *id* {**deny** | **permit**} **icmp** [**VID** [*out*][**inner** *in*]] {*source source-wildcard* | **host** *source*
any

id	/ı Â ˩ ˆ 1-99˝ 100-199˝ 1300-1999˝ 2000-2699˝ 2700 – 2899˝ 700 - 799˜ Â
Deny	٦ ˘ ‡ Â
Permit	٦ ˘ ‡ Â
Source	ˆ ў ˜

27(l)TT0 1 Tf0.0011.1980.45d()Tj/C2_022 Tc 41.976 0 64 .329

match-all	ʔ *tcp flag* Æ
tcp-flag	tcp flag

ACL

ʒ

ѝ ˘ ″I ʒ **access-list** ЬЖ
‡ ≠ Â ≮ Л Ъ é a ≮ '
IP ^ 1-99ᵹ 1300-1999˜ ≮ ⁸ Â
IP ^ 100-199ᵹ 2000-2699˜ ˘ ≮ Л Ъ ⁸ Â
MAC ^ 700-799˜ ˘ ≮ Л Ъ MAC Л Ъ Л Ъ
Expert ^ 2700-2899˜ ˘ Э ˘ ≮ Л Ъ VLAN ID ʔ
Â
TCP Flag ЛЪЮ ʃ '
Â urg
Â ack
Â psh
Â rst
Â syn
Â fin
″I ⌠ '
Â critical
Â flash
Â flash-override
Â immediate
Â internet
Â network
Â priority
Â routine
Ь
Â max-reliability
Â max-throughput
Â min-delay
Â min-monetary-cost
Â normal
ICMP ≯
Â administratively-prohibited

- Â dod-host-prohibited
- Â dod-net-prohibited
- Â echo
- Â echo-reply
- Â fragment-time-exceeded
- Â general-parameter-problem
- Â host-isolated
- Â host-precedence-unreachable
- Â host-redirect
- Â host-tos-redirect
- Â host-tos-unreachable
- Â host-unknown
- Â host-unreachable
- Â information-reply
- Â information-request
- Â mask-reply
- Â mask-request
- Â mobile-redirect
- Â net-redirect
- Â net-tos-redirect
- Â net-tos-unreachable
- Â net-unreachable
- Â network-unknown
- Â no-room-for-option
- Â option-missing
- Â packet-too-big
- Â parameter-problem
- Â port-unreachable
- Â precedence-unreachable
- Â protocol-unreachable
- Â redirect
- Â router-advertisement
- Â router-solicitation
- Â source-quench
- Â source-route-failed
- Â time-exceeded
- Â timestamp-reply
- Â timestamp-request

Â

Â vines-echo

Â xns-idp

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 '

```
Ruijie(config)# access-list 102 permit tcp any any eq domain
Ruijie(config)# access-list 102 permit udp any any eq domain
Ruijie(config)# access-list 102 permit icmp any any echo
Ruijie(config)# access-list 102 permit icmp any any echo-reply
```

3' MAC

Ю ˘ MAC й 00d0f8000c0c ў й 100 Лъ ˘ 1Â '

```
Ruijie(config)# access-list 702 deny host 00d0f8000c0c any aarp
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# mac access-group 702 in
```

4' Expert

Ю … Expert Extended ACL˘ ж ACL IP й 192.168.12.3 з MAC й 00d0.f800.0044 TCP Â

```
Ruijie(config)# access-list 2702 deny tcp host
192.168.12.3 mac 00d0.f800.0044 any any
Ruijie(config)# access-list 2702 permit any any any any
Ruijie(config)# show access-lists
expert access-list extended 2702
10 deny tcp  host  192.168.12.3 mac 00d0.f800.0044 any any
10 permit any any any any
```

ʒ	
show access-lists	
mac access-group	Э MAC

/I	
V10.0	˘ V10.0 ЛъЭ

71.1.2 deny

(deny) ˚ Л ᾱ 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**] [**range** *lower upper*] [**time-range** *time-range-name*]

IP 8 '

Â **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*]

Â **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**] [**range** *lower upper*] [**time-range** *time-range-name*] [**match-all** *tcp-flag*]

Â **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**] [**range** *lower upper*] [**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**] [**range** *lower upper*] [**time-range** *time-range-name*]

a) 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*]

b) protocol

[*sn*] **deny protocol** [[**VID**

[[*icmp-type* [*icmp-code*]] | [*icmp-message*]] [**dscp** *dscp*] [**flow-label** *flow-label*] [**fragments**] [**time-range** *time-range-name*]

Â **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**] [**range** *lower upper*] [**time-range** *time-range-name*] [**match-all** *tcp-flag*]

Â **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**] [**range** *lower upper*] [**time-range** *time-range-name*]

```
192.168.4.12 host 0013.0049.8272 any any
Ruijie(config-exp-nacl)# permit any any any any
Ruijie(config-exp-nacl)# show access-lists
expert access-list extended 2702
10 deny tcp  host  192.168.4.12 host 0013.0049.8272 any any
20 permit any any any any
Ruijie(config-exp-nacl)#
```

2' Ю IP ACL ˘ IP й 192.168.4.12 ў TCP й 100 ┺˘ 1 Â

```
Ruijie(config)# ip access-list extended ip-ext-acl
Ruijie(config-ext-nacl)# deny tcp host 192.168.4.12 eq 100 any
Ruijie(config-ext-nacl)# show access-lists
ip access-list extended ip-ext-acl
10 deny tcp host 192.168.4.12 eq 100 any
Ruijie(config-ext-nacl)# exit
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# ip access-group ip-ext-acl in
Ruijie(config-if)#
```

1Â '

```
Ruijie(config)# ipv6 access-list extended v6-acl
Ruijie(config-ipv6-nacl)# 11 deny ipv6 host 192.168.4.12 any
Ruijie(config-ipv6-nacl)# show access-lists
ipv6 access-list extended v6-acl
11 deny ipv6 host 192.168.4.12 any
Ruijie(config-ipv6-nacl)# exit
Ruijie(config)# interface gigabitethernet 1/1
Ruijie(config-if)# ipv6 traffic-filter v6-acl in
```

¾

¾	
show access-lists	
ipv6 traffic-filter	Э IPV6
ip access-group	IP ACL
mac access-group	MAC ACL
ip access-list	IP ACL Ыж
mac access-list	MAC ACL Ыж
expert access-list	ж ACL Ыж
ipv6 access-list	IPV6 ACL Ыж
permit	Ыж ¾

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ﻝ	
V10.0	˚ V10.0 ЛЪЭ˜ arp ˚ V10.2(3) ЛЪЭ Â

71.1.3 expert access-group

EXPERT ACL Â ¾ **no** ﻝ Â

expert access-group {*id* | *name*} {**in** | **out**}

no expert access-group {*id* | *name*} {**in** | **out**}

id	Expert ﻡˆ 2700-2899˜
name	Expert ﻝ

in	
out	ÿ

Expert ACL

ৡ

ACL Э˘ ⁸ Â **show access-group** ৡ

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
```

ৡ j7.C2_0 1 Tf0 Tc 0 Tw 17.100.2952 Td[<11DA180E>6<0F9B7>Tj/T602D

¾ ┘Л **show expert access-lists** ¾ Â

1' … 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)#
```

2' … 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)#
```

¾	

ip access-group

Ю fastEthernet0/0 Э 120

```
Ruijie(config)# interface fastEthernet 0/0
Ruijie(config-if)#ip access-group 120 in
```

access-list	
show access-lists	
show ip access-list	IP 1-199 1300 – 2699 3000 3199

V10.0	V10.0

71.1.6 ip access-list

... IP ACL IP ACL ACL **no** ACL

ip access-list

1' ... 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)#
```

2 ' ... ACL'

```
Ruijie(config)# ip access-list extended 123
Ruijie(config-ext-nacl)# show ip access-lists
ip access-list extended 123
```


¾ ¬Л **show access-lists** ¾ Â

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
```

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¾	
show access-lists	

¬

¾

Л	
V10.0	˚ V10.0 ЛЪЭ

71.1.8 ipv6 traffic-filter

IPV6 ACL Â ¾ no ¬ Â

ipv6 traffic-filter *name* {**in** | **out**}

no ipv6 traffic-filter *name* {**in** | **out**}

name	IPV6 ¬
in	
out	ÿ

IPV6 ACL

¾

ACL Э˘ ⁸ Â **show ipv6 traffic-filter** ¾

Ю access-list v6-acl Gigabit 1 Э'

```
Ruijie(config)# interface GigaEthernet 0/1
Ruijie(config-if)# ipv6 traffic-filter v6-acl in
```

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¾	
show access-group	Э ACL Â

Л

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V10.0	˚ V10.0 Л∪Э

71.1.9 ipv6 access-list

¾ … IPV6 ACL˘ Â ¾ **no**

३	३	
	show ipv6 access-lists	IPV6

४	
३	V10.0

71.1.10 list-remark text

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¼	
V10.0	˚ V10.0 ЛЪЭ Â

71.1.11 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**}

id	MAC ¼^ 700-799˜
name	MAC ¸
in	
out	ÿ

ACL

¾

¾ ¼Ъ **show running-config** ¾ Â

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
```

¾

¾	
show access-group	Э ACL Â

¼

¾

¼	
V10.0	˚ V10.0 ЛЪЭ

71.1.12 MAC access-list

¾ … MAC ACL˘ Â ¾ **no** ACL

mac access-list extended {*id* | *name*}

sn	ѝ ACL Л

ʒ ACL Ю

ACL Ю ACL

```
Ruijie(config)# ipv6 access-list extended v6-acl
Ruijie(config-ipv6-nacl)# permit ipv6 host ::192.168.4.12 any
Ruijie(config-ipv6-nacl)# 12 deny ipv6 host any any
Ruijie(config-ipv6-nacl)# show access-lists
ipv6 access-list extended v6-acl
10 permit ipv6 host ::192.168.4.12 any
12 deny ipv6 any any
Ruijie(config-ipv6-nacl)# no 12
Ruijie(config-ipv6-nacl)# show access-lists
ipv6 access-list extended v6-acl
10 permit ipv6 host ::192.168.4.12 any
Ruijie(config-ipv6-nacl)#
```

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show access-lists	
ip access-list	ip ACL Ьѫ
ipv6 access-list	IPV6 ACL Ьѫ
deny	Ьѫ Ьѫ ACL
permit	Ьѫ Ьѫ ACL

Л

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Л	
V10.0	˚ V10.0 ЛЪЭ

71.1.14 permit

(**permit**) ˚ ЛЪ ᾱ Â

[*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**] [**range** *lower upper*] [**time-range** *time-range-name*]

Expert '

Â **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*]

Â **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**] [**range** *lower upper*] [**time-range** *time-range-name*] [**match-all** *tcp-flag*]

Â **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*]] [**precedenceprecedence**] [**tos** *tos*] [**fragments**] [**range** *lower upper*] [**time-range** *time-range-name*]

Â **Address Resolution Protocol** (ARP)

[*sn*] **permit arp** {**vid** *vlan-id***}** [**host** *source-mac-address* | **any**] [**host** *destination –mac-address* | **any**] {*sender-ip sender-ip–wildcard* | **host** *sender-ip* | **any**} {*sender-mac sender-mac-wildcard* | **host** *sender-mac* | **any**} {*target-ip target-ip–wildcard* | **host** *target-ip* | **any**}

5) IPV6

[*sn*]

Â **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**] [**range** *lower upper*] [**time-range** *time-range-name*] [**match-all** *tcp-flag*]

Â **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** *destination-ipv6-address* | **any**} [*operator* **port** [**port**]] [**dscp** *dscp*] [**flow-label** *flow-label*] [**fragments**] [**range** *lower upper*] [**time-range** *time-range-name*]

ip access-group	IP ACL
mac access-group	MAC ACL
ip access-list	IP ACL
mac access-list	MAC ACL
expert access-list	ж ACL
ipv6 access-list	IPV6 ACL
deny	ACL

V10.0	V10.0 arp V10.2(3) Â

71.2

71.2.1 show access-group

Э ACL

show access-group [**interface** <*interface*>]

<*interface*>	

Э ACL a Э ACL

```
Ruijie# show access-group
ip access-list standard ipstd3
Applied On interface GigabitEthernet 0/1.
ip access-list standard ipstd4
Applied On interface GigabitEthernet 0/2.
ip access-list extended 101
```

```
Applied On interface GigabitEthernet 0/3.
ip access-list extended 102
Applied On interface GigabitEthernet 0/8.
```

ip access-group	ip
mac access-group	MAC
expert access-group	Expert
ipv6 traffic-filter	IPV6

V10.0	V10.0

71.2.2 show access-lists

ACL ACL

show access-lists [*id* | *name*]

id	
name	

acl *id* *name* ACL

```
Ruijie# show access-lists n_acl
ip access-list standard n_acl
Ruijie# show access-lists 102
ip access-list extended 102
Ruijie# show access-lists
ip access-list standard n_acl
```

```
ip access-list extended 101
mac access-list extended mac-acl
expert access-list extended exp-acl
ipv6 access-list extended v6-acl
```

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¾	
ip access-list	IP ACL Â
mac access-list	MAC ACL
expert access-list	Expert ACL
ipv6 access-list	IPv6 ACL

¼

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V10.0	V10.0

71.2.3 show expert access-group

Expert Â

show expert access-group [**interface** <*interface*>]

<*interface*>	

¾

Expert ACL Â

```
Ruijie# show expert access-group interface gigabitethernet 0/2
expert access-group ee in
Applied On interface GigabitEthernet 0/2.
```

¾

¾	

V10.0	V10.0

71.2.4 show ip access-group

IP ACL

show ip access-group[**interface** <*interface*>]

<*interface*>	

IP ACL

```
Ruijie# show ip access-group interface gigabitethernet 0/1
ip access-group aaa in
Applied On interface GigabitEthernet 0/1.
```

ip access-list	IP ACL

V10.0	V10.0

<interface>	

IPv6 ACL IPv6 ACL

```
Ruijie# show ipv6 traffic-filter interface gigabitethernet 0/4
ipv6 traffic-filter v6 in
Applied On interface GigabitEthernet 0/4.
```

ipv6 access-list	IPV6 ACL

V10.0	V10.0

71.2.6 show mac access-group

MAC

show mac access-group[**interface** <*interface*>]

<interface>	

MAC ACL MAC ACL

```
Ruijie# show mac access-group interface gigabitethernet 0/3
```

```
mac access-group mm in
Applied On interface GigabitEthernet 0/3.
```

mac access-list	MAC ACL

71.3

71.3.1 security access-group

security access-group {*id*|*name*}

no security access-group

id	ACL id
name	ACL

```
Ruijie(config-if)#security access-group 1
```

show secu-acl	

V10.2	V10.2

71.3.2 security global access-group

security global access-group {*id*|*name*}

no security global access-group

id	ACL id
name	ACL

```
Ruijie(config)#security global access-group 1 config)#
```

-	-

Ruijie(config-if)#**security uplink enable**

72 VACL

72.1

Vlan access map ч ˘ è *map_name* ў a ˩ ˘ *map_sn*
˘ ˩Л∪ Â ˩ ˩ mapˆ ˜ ˧ ў map Â

1˜ … **vlan access map** Э … mapˇ a *map_sn* ˘
map з ˩ ў map

no action redirect{GigabitEthernet | Aggregateport | FastEthernet } {*port_id* }

actions forward	
actions drop	
actions redirect	

map forward map

vacl

```
Ruijie(config-access-map)# action forward
Ruijie(config-access-map)# action drop
Ruijie(config-access-map)# action redirect gigabitEthernet 0/50
```

Q – DæhDY˜ A^ñAdY˜E™•ñ2 E d")x•ñ0…#a8 " , ï R)x,6! QfB.ð³ !ÉB! C“$F	

-

-

acl_id	numbered acl;

३ Config-access-map ˘ vacl

+ acl, 8 acl Â

&	Â map ৲ ip acl map acl˘ ч ৲ è ˘ a ’ Â map ৲ 8 acl’ Â map a a acl’ Â map a ace acl˘ acl’ Â map ip acl (mac acl)˘ ¨Ą ip acl (mac acl)˘ ৱ ip acl (mac acl) ip acl (mac acl) ৱ ’ Â map ip acl (mac acl)˘ ¨Ą mac acl (ip acl)˘ ‡ ¨I ╟ ip acl (mac acl)˘ ৱ mac acl (ip acl)’

Ю ˘ map match ‘

```
Ruijie(config)# vlan access-map dd
Ruijie(config-access-map)# match ip address 10 20 sp1 30 sp2
Ruijie(config-access-map)# exit
Ruijie(config)# vlan access-map dd 20
Ruijie(config-access-map)# match mac address 710 720 m1 760
Ruijie(config-access-map)# exit
Ruijie(config)#
```

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[redacted]

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˘ a 100 ˘ a ˩ ’	
˘ [0 - 65535] ˩ ’	

[redacted]

-

map_name	ў map Â
vlan_id	vlan id Â

¾

vlan access map vlan Э ˘ /I ˘ vlan ˘ ' vlan filter aa vlan-list 1-33˝ map 1-33 vlan Э Â

Ю ў map и ff vlan access map vlan 5 Э Â

```
Ruijie(config)# vlan filter ff vlan-list 5
```

¾

¾	
-	-

/I

¾

/I	
-	-

72.2

72.2.1 show vlan access map

ў map ˘ ¾ Â

show vlan access map

ў map ˘ ¾ Â

show vlan access map *map_name*

map_name	ў map '

¾

1' Ю **show vlan access map** '

```
Ruijie(config)# show vlan access-map
Vlan access-map aa  10
match mac address:   700, 710, m1, 720,
action: forward
Vlan access-map aa  20
match ip address:   10, 20, 30, sp1, sp2, 60, 50, 80,
action: drop
Vlan access-map dd  20
match mac address:   710, 720, m1, 760,
action: forward
Ruijie(config)#
```

2' Ю **show vlan access map** { *map_name* } '

```
Ruijie(config)# show vlan access-map dd
Vlan access-map dd  20
match mac address:   710, 720, m1, 760,
action: forward
Ruijie(config)#
```

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-	-

Ñ

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-	-

72.2.2 show vlan filter

ў map vlan Э ˘ Ю ¾ Â

show vlan filter

?

?

Ю **Show vlan filter access-map** *aa*

```
Ruijie(config)# show vlan filter
VLAN Map aa
Configured on VLANs: 1,  5,  6,
Ruijie(config)#
```

?

?	
show vlan filter *access-map map_name*	ў map vlan Э
show vlan filter vlan *vlan_id*	vlan Э ў map

?

/\	
-	-

?

73 QOS

73.1

QoS ˘ QoS ЛЬЮ '

1 policy-map'

policy-map ˩ Л Ь class-map'

class-map 1 ACL˘ ACL ACE ɛ ˩ '

Э ACE ÿ “ ACL” ⁸ Â

Ю˘ QoS ╖ Â ˩ Â Policy Map

Э˘ ˘ QoS ╖ Â

QoS ╖ ˘ ᾱ Policy Map ˘ ѝ Off

˩ Â Л ЬЮ ѝ 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
1	2
2	3
3	4
4	5
5	6
6	7
7	8

Cos

CoS to DSCP

CoS	DSCP
0	0
1	8
2	16
3	24
4	32
5	40
6	48

73.2.1 class maps

… ACL'

ip access-list {**extended** | **standard**} { *acl-id* | *acl-name* }

mac access-list extended {*acl-id* | *acl-name*}

expert access-list extended {*acl-id* | *acl-name*}

ipv6 access-list extended *acl-name*

access-list acl-id ৡˆ ACL ˜

… class map˘ class map '

[**no**] **class-map** *class-map-name*

… class map ৭ '

[**no**] **match access-group** *acl-name*| *acl-id*

acl-name	… ACL ৯
acl-id	… ACL id
class-map-name	… class map ৯
no class-map *class-map-name*	class map
no match access-group *acl-name*| *acl-id*	৭

ৡ

1' … MAC ACL, ৯ me

```
Ruijie(config)# mac access-list extended me
```

2' ACL ‡

```
Ruijie(config-ext-macl)# permit host 1111.2222.3333 any
```

3' ACL

```
Ruijie(config-ext-macl)# exit
```

4' … class-map, ৯ cm

```
Ruijie(config)# class-map cm
```

5' ACL

```
Ruijie(config-cmap)# match access-group me
  6'      class-map
Ruijie(config-cmap)# exit
```

show mac access-lists	-
show ip access-lists	-
show class-map	-

-	-

73.2.2 drr-queue bandwidth

DRR

drr-queue bandwidth *weight1...weight8*

no drr-queue bandwidth

weight1...weight8	
no	

```
Ruijie(config)# drr-queue bandwidth 1 2 3 4 5 6 7 8
```

show mls qos queueing	-

-	-

73.2.3 interface rate-limit

8

rate-limit {**input** | **output**}

CoS

mls qos cos

Ruijie(config)# **mls qo map cos-dscp** *8 10 16 18 24 26 32 34*

show mls qos maps	dscp-cos maps,dscp-cos maps ip-prec-dscp maps

-	-

73.2.6 mls qos map dscp-cos

DSCP CoS

mls qos map dscp-cos *dscp-list* to *cos*

no mls qos map dscp-cos

dscp-list	a a
cos	0 7
no	

Ruijie(config)# **mls qos map dscp-cos** 8 10 16 18 to 0

-	-

a

ৡ

Ruijie(config)# **interface gigabitethernet** *1/1*
Ruijie(config-if)# **mls qos trust cos**

ৡ

ৡ	
show mls qos interface *interface-id*	-

ৣ S8600 **cos dscp ip-precedence**

ৡ

ৣ	
-	-

73.2.10 policy maps

… policy map policymap

[**no**] **policy-map** *policy-map-name*

… policy map class-map ৲ , ৲

[**no**] **class** *class-map-name*

IP ipdscp ˘ IP a

set ip dscp *new-dscp*

no set ip dscp

8 ѝ ৲ ╟

police *rate-bps burst-byte*[**exceed-action** {**drop** | **dscp** *dscp-value*}]

no police

policy-map-name	… policymap ৸
no policy-map *policy-map-name*	policy map

class-map-name	… class map
no class *class-map-name*	
new-dscp	DSCP
rate-bps	kbps
burst-byte	kbyte
drop	
dscp-value	DSCP

1' … policy map, po

```
Ruijie(config)# policy-map po
```

2' class-map cm

```
Ruijie(config-pmap)# class cm
```

3' dscp 10

```
Ruijie(config-pmap-c)# set ip dscp 10
```

4' 1M, 4096k, dscp 16

```
Ruijie(config-pmap-c)# police 1000000 4096 exceed-action dscp 16
```

show policy-map	-

S8600 20. -3 Td<08ref66.84 338.18 63.12 0.24 rB0318211.40 1 Tf0 Tc 10.5 029 Tf.7 j/

priority-queue	й SP
no priority-queue	й WRR

й WRR

ʒ

Ruijie(config)# **no priority-queue**

ʒ	
show mls qos queueing	-

ʌ

ʌ	
-	-

73.2.12 priority-queue cos-map

CoS

priority-queue cos-map *qid cos0* [*cos1* [*cos2* [*cos3* [*cos4* [*cos5* [*cos6* [*cos7*]]]]]]]

no priority-queue cos-map

id *qid*	й id

Ruijie(config)# **priority-queue cos-map** *1 0 1*

show mls qos queueing	-

a a

-	-

73.2.13 service-policy

policy map

service-policy {**input** | **output**} *policy-map-name*

no service-policy {**input** | **output**}

policy-map-name	… policymap
no	policy map

Ruijie(config)# **interface fastEthernet** *0/1*
Ruijie(config-if)# **service-policy input po**

show mls qos interface	-

S8600 input output

	-	-

73.2.14 wfq-queue bandwidth

wfq

73.2.15 wfq-queue sp

wfq Ю˘ ֳ ш ˝l (sp) Â

wfq-queue *queue-id* **sp**

no wfq-queue *queue-id* **sp**

queue-id	/l
sp	ш ˝l

a sp

ֳ

wfq Э˘ ֳ ˩ Л℧ Л℧ sp+wfq Â

wfq '

```
Ruijie(config)# mls qos scheduler wfq
Ruijie(config)# show mls qos scheduler
```

1 3 ѝ ш '

```
Ruijie(config)# wfq-queue 1 sp
Ruijie(config)# wfq-queue 3 sp
Ruijie(config)# show running
```

ֳ

ֳ	
show mls qos scheduler	QOS

/l ˘ RGOS10.1 Л℧Э

ֳ

/l	
-	-

73.2.16 wrr-queue bandwidth

WRR

wrr-queue bandwidth *weight1 ... weightn*

no wrr-queue bandwidth

weight1...weightn	ӣ n ˘ n ৸
no	

weight1: ...: weightn = 1:...:1

ৡ

```
Ruijie(config)# wrr-queue bandwidth 1 2 3 4 5 6 7 8
```

ৡ

ৡ	
show mls qos queueing	-

৸ a ৯ a ৯˘ Â

ৡ

৸	
-	-

73.3

73.3.1 show class-map

class map

show class-map [*class-name*]

class-name	class map ৯

Ruijie# **show class-map**

ʔ	

73.3.3 show mls qos interface

QoS

show mls qos interface *interface-id* [**policers**]

interface-id	
policers	police

QOS

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QOS ¶

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Ruijie# **show mls qos maps**

¶

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- -

¶

/¶

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- -

73.3.5 show mls qos queueing

QoS (cos-to-queue map,wrr weight,drr weight)

show mls qos queueing

- -

¶

Ruijie# **show mls qos queueing**

¶

¶

- -

¶ S8600 ' cos-to-queue map,wrr weight,drr weight Â

¶ /¶

-	-

73.3.6 show mls qos rate-limit

8

show mls qos rate-limit [**interface** *interface-id*]

interface	interface-id rate-limit

Ruijie# **show mls qos rate-limit**

-

-

73.3.7 show mls qos scheduler

"|

show mls qos scheduler

-

-

Ruijie# **show mls qos scheduler**

-	-

S8600

-	-

WRED ३१

… ˘ ৡ Â

˘ ৡ no Â

wrr-queue random-detect max-threshold *queue_id thr1* [*thr2 thr3*]

no wrr-queue random-detect max-threshold *queue_id*

queue_id	৸
thr1	
thr2	৻
thr3	৳

ৡ

1

WRED Ю ৸ Â WRED

WRED ৸ Â ৸ WRED

˘ ≠ ৸ è Â

S86 à 96 t a ৸ ˘ ৷Ƴ ৶ Â x @

queue_id	৸
thr1	æ
thr2	ɣ æ
thr3	Ь æ

ৡ

WRED Ю ɻ Â WRED
WRED ɻ Â

prob1	
prob2	γ
prob3	Ь ˆ S86 ˜

¾

˩ Л∪ DSCP-CoS CoS-threshold DSCP б threshold
Â
Э CoS ˩ threshold ˘ Э WRED
RED Â

Ю cos ѝ 1 à 6 γ ˘ γ ˆ
cos б ˘ Ю priority-queue cos-map ¾˜ '

```
Ruijie(config-if)#wrr-queue cos-map 2 1 6
```

¾

¾	
-	-

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¾

Л	
-	-

74.3

74.3.1 show queueing wred interface

wred ˘ ¾ Â

show queueing wred interface<*interface*>

Interface	Л

¾

Ю show queueing wred interface g0/1 '

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

```
qid max_1 min_1 prob_1 max_2 min_2 prob_2 max_3 min_3 prob_3
-----  -----  -----  ------  -----  -----  ------
1   0   0   90    0    0    91    0   0   92
2   88  66  90    87   55   91    86  66  92
3   0   0   0     0    0    0     0   0   0
4   0   0   0     0    0    0     0   0   0
5   88  66  0     89   67   0     90  68  0
6   0   0   0     0    0    0     0   0   0
7   0   0   0     0    0    0     0   0   0
8   0   0   0     0    0    0     0   0   0
cos  qid  threshold_id
---  ---  ------------
0   1   1
1   2   1
2   3   1
3   4   2
4   5   1
5   6   3
6   7   2
7   8   1
```

-	-

-	-

76 VRRP

76.1

76.1.1 vrrp authentication

¾ VRRP ╖ ˘ è **no** ╖ Â

vrrp group authentication *string*

no vrrp *group* **authentication**

group	VRRP /ı
string	VRRP (a 8 ˘ ¾ ¾)

Ю˝ Э VRRP ╖ Â VRRP ╖ ˘ ¾ Â

¾

ل VRRP ل ¾ Â ¾ a ˘ ı / VRRP Â

IPv6 VRRP ╖ ˘ IPv6 Э ¾˘ a Â

Ю ѝ VRRP 1 ¾ Â

```
vrrp 1 authentication x30dn78k
```

¾	
Ruijie(config-if)# **vrrp** *group ip ipaddress* [**secondary**]	VRRP ╖ IP

ı

¾	/ı

-	-

76.1.2 vrrp description

३ й VRRP ˘ è **no** Â

vrrp *group* **description** *text*

no vrrp group description

group	VRRP Л
text	VRRP

Ю˝ Э VRRP ╖ Â VRRP ╖ ˘ ≠ VRRP Â

३

й VRRP ˘ ┘Л Ш† VRRP Â

Ю Л E0 Э VRRP 1 й 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”
```

३	
Ruijie(config-if)# **vrrp** *group* ip *ipaddress* [**secondary**]	VRRP ╖ IP

Л

Л	
-	-

76.1.3 vrrp ip

ֽ Э VRRP IP ˘ è **no** Э VRRP
╖ ↓ IP Â

vrrp *group* **ip** *ipaddress* [**secondary**]

no vrrp *group* **ip** *ipaddress* [**secondary**]

group	VRRP Л
ipaddress	IP
secondary	IP

Ю˝ Э VRRP ╖ Â

ֽ

a secondary ˘ ж IP й ў IP Â
˘ VRRP Лu IP ˘ no ֽ ↓ VRRP IP
˘ й ˘ й Э ч ┘ IP Â

Ю ˘ Лu 0 Э VRRP ╖ Â VRRP Л й 1˝
ў IP й 10.0.1.20˝ IP й 10.0.2.20 Â

```
interface FastEthernet 0/0
no switchport
ip address 10.0.1.1 255.255.255.0
ip address 10.0.2.1 255.255.255.0 secondary
vrrp 1 ip 10.0.1.20
vrrp 1 ip 10.0.2.20 secondary
```

ֽ

ֽ	
Ruijie# **show vrrp** [**brief	group**]	VRRP

↓

ֽ

Л	
-	-

76.1.4 vrrp ipv6

३ Э IPv6 VRRP IPv6 ˘ è **no**
Э VRRP ╖ ↓ IPv6 Â

vrrp *group* **ipv6** *ipv6-address*

no vrrp *group* **ipv6** *ipv6-address*

	3.0251 0 Td<0D040D142Crp 18/TT

vrrp *group* **priority** *level*

no vrrp *group* **priority**

-144.24229.22 reW* n0.852 g141.6 2144182 155.1 239.44refQ0.852 g147.36309

Ю Э VRRP ╖ Â VRRP ╖ ˘ ў
ѝ 1 Â

३

VRRP ў ˘ Л∪ VRRP
VRRP à ″I Л∪ è Â

Ю ˘ VRRP ѝ 4 Â

```
vrrp 1 timers advertise 4
```

३

३	
Ruijie(config-if)# **vrrp** *group* **ip** *ipaddress* [**secondary**]	VRRP ╖ IP
Ruijie(config-if)# **vrrp group timers learn**	˝ ╖

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४	
-	-

76.1.8 vrrp timers learn

३ ˝ ╖ ˘ è no ╖ Â

vrrp *group* **timers learn**

no vrrp *group* **timers learn**

group	VRRP ४

Ю Э VRRP ╖ Â VRRP ╖ ˘
Ю ˝ ╖ Â

३

˝ ╖ ˘ VRRP ˘ ˝ ╖

Л˘ ÿ ў VRRP ˝ VRRP ˘ Master

ipv4-addres	IPv4 ˘ ˘ bfd Â
ipv6-global-addres	IPv6
ipv6-linklocal-addree	IPv6
interval-value	Â Æ ѝ Â a ˘ ѝ 3 Â
timeout-value	ʌ Â ˘ ˘ ‡ ѝ a ˩ Â Æ ѝ Â a ˘ ѝ 1 Â
priority	˩ è VRRP ˝I ˩ Â a ˘ ѝ 10 Â

Ю˘ Э VRRP ╖ Â VRRP ╖ ˘
à IPv4 IPv6 Â

३

˩ Л Ъ ३ ˘ ˬ Ь ˩
(Routed Port ˘ SVI ˘ Loopback˘ Tunnel) Â
ў ˘ IPv4 ˘ ў IPv4 ' IPv6 ˘
ў IPv6 Â
ў ˘ Â

1' Ю ˘ VRRP 1 Routed Port Fa1/1 Â Fa1/1
˘ VRRP ˝I 30' Fa1/1 ʌ˘ VRRP 1 ˝I Â

```
vrrp 1 track FastEthernet 1/1 30
```

2' Ю ў 1000::1 ˩ Â

```
vrrp 1 track 1000::1
```

3' Ю VLAN 1 Э ў FE80::1 ˩ ˘
Â

```
vrrp 1 track FE80::1 vlan 1
```

```
#       VRRP       BFD              192.168.1.3
Ruijie#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)#interface FastEthernet 0/1
Ruijie(config-if)#no switchport
Ruijie(config-if)#ip address 192.168.1.1 255.255.255.0
Ruijie(config-if)#bfd interval 50 min_rx 50 multiplier 3
Ruijie(config)#interface FastEthernet 0/2
```

```
Ruijie# debug vrrp
Ruijie#
VRRP: Grp 1 Advertisement priority 120, ipaddr 192.168.201.213
VRRP: Grp 1 Event - Advert higher or equal priority
%VRRP-6-STATECHANGE: FastEthernet 0/0 Grp 1 state Master -> Backup
VRRP: Grp 1 Advertisement from 192.168.201.213 has invalid virtual
address 192.168.1.1
%VRRP-6-STATECHANGE: FastEthernet 0/0 Grp 1 state Backup -> Master
Ruijie#
```

३	
Ruijie# **debug vrrp errors**	VRRP
Ruijie# **debug vrrp events**	VRRP Y˘
Ruijie# **debug vrrp state**	VRRP

/I	
-	-

76.2.2 debug vrrp errors

३ VRRP ˘ è no Â

debug vrrp errors

no debug vrrp errors

-	-

ЮЎ VRRP Â

Ю ˘ 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
```

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-	-

M

¾

M	
-	-

76.2.3 debug vrrp events

¾ VRRP Y ˚ ˘ è no Â

debug vrrp events

no debug vrrp events

-	-

HO˝ VRRP Y ˚ Â

¾

HO ˘ VRRP Y ˚ Â

```
Ruijie# debug vrrp events
Ruijie#
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
```

३	३	
	-	-

४		
३	४	
	-	-

76.2.4 debug vrrp packets

३ VRRP ˘ è **no** Â

VRRP: Grp 1 Advertisement priority 120, ipaddr 192.168.201.213

-	-

Ruijie#

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-	-

⁄
-

76.3

76.3.1 show vrrp

३ VRRP Â

show vrrp [**brief** | *grou*p]

brief	˘ VRRP
group	VRRP ⁄

३

a ˘ VRRP Â

1' VRRP

```
Ruijie# show vrrp
FastEthernet 0/0 - Group 1
State is Backup
Virtual IP address is 192.168.201.1 configured
Virtual MAC address is 0000.5e00.0101
Advertisement interval is 3 sec
Preemption is enabled
min delay is 0 sec
```

```
Priority is 100
Master Router is 192.168.201.213 , pritority is 120
Master Advertisement interval is 3 sec
Master Down interval is 9 sec
FastEthernet 0/0 - Group 2
State is Master
Virtual IP address is 192.168.201.2 configured
Virtual MAC address is 0000.5e00.0102
Advertisement interval is 3 sec
Preemption is enabled
min delay is 0 sec
Priority is 120
Master Router is 192.168.201.217 (local), priority is 120
Master Advertisement interval is 3 sec
Master Down interval is 9 sec
```

2' VRRP

```
Ruijie# show vrrp brief
Interface   Grp Pri Time  Own Pre State   Master addr     Group addr
FastEthernet 0/0   1   100   -    -   P  Backup  192.168.201.213
192.168.201.1
FastEthernet 0/0   2   120   -    -   P  Master  192.168.201.217
192.168.201.2
```

¾

¾	
Ruijie(config-if)# **vrrp** *group ip ipaddress* [**secondary**]	VRRP ¶ IP

¼

¾

¼	
-	-

76.3.2 show vrrp interface

¾ Э VRRP Â

show vrrp interface *type number* [**brief**]

type	
number	
brief	

Ю Л E1/0 Э VRRP

```
Ruijie# show vrrp interface fastethernet 0/0
FastEthernet 0/0 - Group 1
State is Backup
Virtual IP address is 192.168.201.1 configured
Virtual MAC address is 0000.5e00.0101
Advertisement interval is 3 sec
Preemption is enabled
min delay is 0 sec
Priority is 100
Master Router is 192.168.201.213 , pritority is 120
Master Advertisement interval is 3 sec
Master Down interval is 9 sec
FastEthernet 0/0 - Group 2
State is Master
Virtual IP address is 192.168.201.2 configured
Virtual MAC address is 0000.5e00.0102
Advertisement interval is 3 sec
Preemption is enabled
min delay is 0 sec
Priority is 120
Master Router is 192.168.201.217 (local), priority is 120
Master Advertisement interval is 3 sec
Master Down interval is 9 sec
```


	Ruijie(config-if)# **vrrp** *group* **ip** *ip address* [**secondary**]	VRRP 刂 IP

77 BFD

77.1

77.1.1 bfd

Ю **bfd** ৡ BFD ˘ ⅃Л **no** ৡ BFD Â

bfd interval *milliseconds* **min_rx** *milliseconds* **multiplier** *multiplier-value*

no bfd interval *milliseconds* **min_rx** *milliseconds* **multiplier** *multiplier-value*

Interval *milliseconds*	BFD BFD ⁸ ˘ *mi///iseconds* ⅃ й 50ms 999ms Â ≠ echo Â
min_rx *milliseconds*	BFD BFD ⁸ ˘ *mi///iseconds* ⅃ й 50ms 999ms Â
Multiplier *multiplier-value*	BFD ⁸ ˘ *multiplier-value* ⅃ й 3 50 Â

˘ ╟ BFD

ৡ

ৡ a L3 AP Ю

Routed Port FastEthernet 0/2 Э BFD Â

```
Ruijie(config)# interface fastEthernet 0/2
Ruijie(config)# no switchport
Ruijie(config-if)# bfd interval 100 min_rx 100 multiplier 3
```

ৡ

ৡ	
bfd all-interfaces	б BFD ╟ Â

clear bfd	BFD Â
ip ospf bfd	OSPF б BFD ╟Â
ip rip bfd	RIP б BFD ╟

ʃ

ʃ	
10.3(4b3)	ʒ

77.1.2 bfd all-interfaces

router (RIP,OSPF)Ю **bfd all-interfaces** ʒ б BFD ╟˘ **no** ʒ ╖ Â

bfd all-interfaces

no bfd all-interfaces

a б BFD ╟

ʒ

ч ┘Л б BFD ╟'
' OSPF RIP Ю [**no**] **bfd all-interfaces** ʒ
б BFD ╟'
ү ' ┘Л **ip ospf bfd** [**disable**] **ip rip bfd** [**disable**]
ʒ OSPF RIP б BFD ╟'

Ю OSPF б BFD ╟Â

```
Ruijie(config)# router ospf 123
Ruijie(config-router)# bfd all-interface
```

bfd	BFD Â
ip ospf bfd	OSPF б BFD ╟Â
ip rip bfd	RIP б BFD ╟

10.3(4b3)	

77.1.3 bfd cpp

Ю **bfd cpp** BFD ˘ **no** BFD Â

bfd cpp

no bfd cpp

Ю BFD

BFD ˘ BFD ╖ ↓ ↓Л BFD
Â BFD ╖ ↓ ˘ Э

slow-timer ѝ 14000 Â
Ruijie(config)# **bfd slow-timer** 14000

٪	
bfd echo	BFD Echo ╖

Л	
10.3(4b3)	٪

77.1.6 ip ospf bfd

Ю **ip ospf bfd** ٪ OSPF б BFD ╠˘ **disable**
˘ **no** ٪ Â

ip ospf bfd [**disable**]

no ip ospf bfd

disable	(┘) Э OSPF б BFD ╠ Â

disable ѝ OSPF б BFD ╠

٪

ч ┘Л OSPF б BFD ╠'
' OSPF Ю [**no**] **bfd all-interfaces** ٪
б BFD ╠'

γ ' ┘Л **ip ospf bfd [disable]** ¾
OSPF б BFD ╠'

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
```

¾

¾	
bfd	BFD Â
bfd all-interfaces	б BFD ╠

┘

¾

┘	
10.3(4b3)	¾

77.1.7 ip rip bfd

Ю **ip rip bfd** ¾ RIP б BFD ╠˘ **disable**
˘ **no** ¾ Â

ip rip bfd [**disable**]

no ip rip bfd

disable	(┘) Э RIP б BFD ╠Â

ч ┘Л RIP б BFD ╟'
' RIP Ю [**no**] **bfd all-interfaces** ३
б BFD ╟'
γ ' ┘Л **ip rip bfd [disable]** ३
RIP б BFD ╟'

Routed Port FastEthernet 0/2 Э RIP б BFD ╟Â

```
Ruijie(config)# interface FastEthernet 0/2
Ruijie(config-if)# no switchport
Ruijie(config-if)# ip rip bfd disable
```

३

३	
bfd	BFD Â
bfd all-interfaces	б BFD ╟

Л

३

Л	
10.3(4b3)	३

77.1.8 ip route static bfd

Ю **ip route static bfd** ३ б BFD ╟˘ **no** ३
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*]

vrf *vrf-name*	(┘) VRF ┘ Â

interface-type interface-number	/1 Â
gateway	IP˝ ù BFD IP Â Ю ù BFD ┘ Â
source *ip-address*	(┘) BFD IP , IP ù Ю˝ Â

б BFD ╟

¸

¨I BFD

BFD ˘ BFD б 172.16.0.2 Â

```
Ruijie(config)# interface FastEthernet 0/1
Ruijie(config-if)# no switchport
Ruijie(config-if)# ip address 172.16.0.1 255.255.255.0
Ruijie(config-if)# bfd interval 50 min_rx 50 multiplier 3
Ruijie(config-if)# ip route static bfd FastEthernet 0/1 172.16.0.2
Ruijie(config-if)# ip route 10.0.0.0 255.0.0.0 FastEthernet 0/1
172.16.0.2
```

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¸	
bfd	BFD Â

┘

¸

/1	
10.3(4b3)	¸

77.1.9 ipv6 route static bfd

Ю **ipv6 route static bfd** ३ б BFD ╟˘ **no** ३
Â

Ipv6 route static bfd [**vrf** *vrf-name*] *interface-type interface-number gateway* [**source** *ipv6-address*]

no ipv6 route static bfd [**vrf** *vrf-name*] *interface-type interface-number gateway* [**source** *ipv6-address*]

vrf *vrf-name*	(┘) VRF ┘ Â

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३

ৰ	
RGOS10.4E	३

77.1.10 neighbor fall-over bfd

router address-family Ю, **neighbor fall-over** ३ BGP б BFD ╟ ↓ ╕ BGP , **no** ३ ╖

neighbor *ip-address* **fall-over bfd**

no neighbor *ip-address* **fall-over bfd**

ip-address	BGP Â

BGP a BFD ╖

३

″I IP BFD

```
# BGP BFD ˘ BFD б 172.16.0.2
Ruijie(config)# router bgp 44000
Ruijie(config-router)# bgp log-neighbors-changes
Ruijie(config-router)# neighbor 172.16.0.2 remote-as 45000
Ruijie(config-router)# neighbor 172.16.0.2 fall-over bfd
Ruijie(config-router)# end
```

10.3(4b3)	

77.1.11 set ip next-hop verify-availability

Route-map **set ip next-hop verify-availability** BFD TRACK IP

set ip next-hop verify-availability [*next-hop-address* [**track** number**|bfd** [**vrf** *vrf-name*] *interface-type interface-number gateway*]]

no set ip next-hop verify-availability [*next-hop-address* [**track** *number*|**bfd** [**vrf** *vrf-name*] *interface-type interface-number gateway*]]

vrf *vrf-name*	VRF
next-hop-address	IP
track	Track
number	track
bfd	BFD
interface-type interface-number	
gateway	IP BFD IP BFD

a BFD

IP BFD

show bfd neighbors [**vrf** *vrf-name*] [**ipv4** *ip-addess* [**details**]| **ipv6** *ip-addess* [**details**] | **client** {**bgp|ospf|rip|vrrp|static-route|**} [**ipv4** *ip-addess* [**details**] | **ipv6** *ip-addess* [**details**]| **details**]]

```
Received MinRxInt: 50000, Received Multiplier: 3
Holdown (hits): 600(22), Hello (hits): 200(84453)
Rx Count: 49824, Rx Interval (ms) min/max/avg: 208/440/332
Tx Count: 84488, Tx Interval (ms) min/max/avg: 152/248/196
Registered protocols: BGP
Uptime: 02:18:49
Last packet:  Version: 1              - Diagnostic: 0
              I Hear You bit: 1       - Demand bit: 0
              Poll bit: 0             - Final bit: 0
              Multiplier: 3           - Length: 24
              My Discr.: 2            - Your Discr.: 1
              Min tx interval: 50000  - Min rx interval: 50000
              Min Echo interval: 0
```

OurAddr	IP
NeighAddr	IP
LD/RD	

RH ☋ c c ३ ३

Rx Count	BFD
Rx Interval (ms) min/max/avg	˘ ˘
Tx Count	BFD
Tx Interval (ms) min/max/avg	˘ ˘
Registered protocols	Ä
Uptime	UP
Last packet	∧ BFD

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10.3(4b3)	३

78 RERP

78.1

78.1.1 rerp enable

ৡ 8 RERP ╖ Â

rerp enable

no rerp enable

rerp fail- interval *num*

no rerp fail- interval

78.1.6 edge-ring

˘ ३ ˘ ″I RERP ring Â

edge-ring *num* **role** [**primary-edge|secondary-edge**] **ctrl-vlan** *vid* **shared-port interface** *interface-id* **sub-port interface** *interface-id*

no ring *num*

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Â

major-ring *num* **edge-ring-vlan** *vid*

num

ʒ EXEC

Ю ʒ '

```
Ruijie# show rerp
rerp state                   : enable
rerp admin hello interval    : 1(*1s)
rerp admin fail interval     : 3(*1s)
rerp edge interval       : 1(*300 ms)
rerp local bridge        : 001a.a902.fe0b
-----------------------------------
region 1
ring                         : 1
rerp oper hello interval     : 1
rerp oper fail  interval     : 3
ring master                  : 001a.a902.fe0b
ctrl-vlan                    : 100
edge-vlan                    :
role                         : master
primary-port                 : Gi 0/4(forwarding)
secondary-port               : Gi 0/21(down)
```

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78.2.2 show rerp statistics

RERP Â

show rerp statistics region *num* **ring** *ring_id*

-	-

¾ EXEC

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```
Ruijie# sh rerp statistics regiong 1 ring 1
The statistics for region 1 ring 1 GigabitEthernet 0/4
TX hello packets       23, RX hello packets          0
TX edge-hello packets   0, RX edge-hello packets     0
TX flush packets        0, RX flush packets          0
TX down packets      0, RX down packets              0
TX up packets            0, RX up packets           0
TX major fail packets   0, RX major fail packets     0
TX major resume packets  0, RX major resume packets  0
TX sub complete packets  0, RX sub complete packets  0
The statistics for region 1 ring 1 GigabitEthernet 0/5
TX hello packets       23, RX hello packets           0
TX edge-hello packets   0, RX edge-hello packets      0
TX flush packets        0, RX flush packets           0
TX down packets      0, RX down packets               0
TX up packets            0, RX up packets            0
TX major fail packets   0, RX major fail packets      0
TX major resume packets  0, RX major resume packets    0
TX sub complete packets  0, RX sub complete packets    0
```

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78.2.3 clear rerp statistics

RERP Â

clear rerp statistics

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¾ EXEC

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78.2.4 debug rerp

RERP Ł Â ¾ no Â

debug rerp [**packet** | **event**]

undebug rerp [**packet** | **event**]

packet	Â
event	Y˜ Â

EXEC

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-	-

79 REUP

79.1

79.1.1 mac-address-table move update receive

REUP MAC Â

mac-address-table move update receive

no mac-address-table move update receive

REUP MAC Â

mac-address-table move update transit

no mac-address-table move update transit

-	-

disable Â

३ Â [<6q27<01C81B([c0.003T47.7689-19.61810.0w

३ Â

ѝ ѝ MAC ˘ ˘ ╗
MAC Â ↰ ⌈ Э ╗ ↵ MAC
˘ Ю ╗ Â

Ю ╗ MAC '
Ruijie(config-if)# **mac-address-table update group** *2*

३	
show mac-address-table update group	Э MAC Â

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79.1.4 switchport backup interface *interface-id*

REUP ↰ Â

switchport backup interface *interface-id*

no switchport backup

interface-id	ID Â

↰ Â

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ѝ ў ˘ interface-id ѝ Â ╟
⁄˘ Â

Ю ↰ ˘ fa 0/1 ѝ ў ˘ fa 0/2 ѝ '
Ruijie(config)# **interface fa** *0/1*

```
Ruijie(config-if)# switchport backup interface fa 0/2
```

```
            preemption delay 40
```

	-	-

	-	-

79.2.2 show interfaces [*interface-id*] switchport backup [detail]

	interface-id	ID

EXEC

```
Ruijie # show interfaces switchport backup detail
```

3	/1	
	-	-

80 RLDP

80.1

80.1.1 rldp detect-interval

¶ RLDP Э Â

rldp detect-interval *interval*

no rldp detect-interval

interval	˘ ◊ й 2-15

3 Â

¶ Â

stp Ю˘ × Л stp Â

Ю й 5s :

```
Ruijie(config)# rldp detect-interval 5
```

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rldp detect-max	

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80.1.2 rldp detect-max

¶ RLDP Э ˘ ˘

Ў ˘ ‡ й Â

rldp detect-max *num*

no rldp detect-max

num	, ¼ ù 2-10

2

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¾ ˘ Â

Ю ù 5 '

```
Ruijie(config)# rldp detect-max 5
```

¾	
rldp detect-interval	

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80.1.3 rldp enable

¾ ⁸ RLDP ¶ Â

rldp enable

no rldp enable

Â

¾ Â

	↙ RLDP ˘ RLDP Â
	Ю '
	Ruijie(config)# **rldp enable**

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```
Ruijie(config)# interface fas 0/1
Ruijie(config-if)# rldp port loop-detect block
```

rldp enable	rldp

-	-

80.1.5 rldp reset

rldp shutdown **disable** rldp Â

rldp reset

-	-

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¶ ˘ ¾ no ¶ Â

[**no**] **tp-guard port enable**

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ÞO ¶ ˘ ‡ CPU
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˘ è (AP) a ¾ Â

ÞO ¶ '

```
Ruijie(config-if)# tp-guard port enable
Ruijie(config-if)# no tp-guard port enable
```

¾	
topology guard	¶

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81.2 TPP

81.2.1 show tpp

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show tpp

-	-

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३ tpp Â

Ю ℸ '

```
Ruijie# show tpp
```

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topology guard	ℸ

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-	-

82 NLB GROUP

82.1

82.1.1 nlb-group

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show nlb-group Â

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^ show run ≠ a ~ Â Э

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˘ Â

Â ^ interface-range

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Â IP MAC ˩ ˘

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Â 5 Â

Â IP Â

1 fĮRuijie(config)#_2 1 TTT3.0024 9BTTj/C2nlb-group2 1 TTT2.0024 86 0 5.389Q

show nlb-group	

S8600

10.4 2b3	

82.2

82.2.1 show nlb-group

show nlb-group [*group_number*]

reflector-port	٧
cluster-vrf	VRF ٨
cluster-ip	IP

٦	
nlb-group	… б Â

٧ ٦ S8600 Э Â

٨	
10.4 2b3	٦

VSU

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	10.4	३

83.1.2 dual-active exclude interface

VSU ┤ ў ⁄˘ ÿ ˘
dual-active exclude interface ३ a Â no
dual-active exclude interface ३ ┘ Л∪ Â

dual-active exclude interface *interface-name*

no dual-active exclude interface *interface-name*

dual-active detection dadp

Ruijie (config-vs-domain)# **dual-active pair interface** GigabitEthernet 1/1/1 **interface** GigabitEthernet 2/1/1 **bfd**

¾	
dual-active detection bfd	BFD ˩ ў ╖
dual-active exclude interface	˩ ў
show switch virtual dual-active	˩ ў ╖

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/I	
10.4	¾

83.1.4 install switch

Ю install switch ¾ ˘ ˩ЛЦ no ¾

Â

install switch *num switch-type*

no install switch *num*

num	VSU /I˘ ˽ 1 2
switch-type	

g61ĝC3Ĥ 1 ĦĦ34 034 816ĵĴ_D0 24C1 2469 0 24 095B516Ĥ 22052 6312 2Ĥ3F(

¾

ч ˽ Nj ; 0

switch 2 Э

```
Ruijie(config)# install switch 2
```

٦	
install *slot-num moduletype*	Э
no install *slot-num*	Э

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٨	
10.4(2b3)	٦

83.1.5 switch

switch *num* ٤ Л٥ VSU ٨˘ no ٤ Л٥ Â

switch *num*

no switch

num	VSU ٨˘ ٤ 1 2

٨ 1

٦ config-vs-domain

٨ ˘ VSU Ю˘ ٨ ÿ
ľ slot/port Ł й ľ switch/slot/port Ł˘ è ľ switch Ł ٨ Â
ў ˘ ч ٤ ў ˘ • ╠
˘ з ч ٤ ″І ٤˘ ж ٨ й ў Â
٤ Ю ٨˘ a VSU Ю ٨ Â

```
# ٨ й 1 VSU ٨ й 2
Ruijie(config)# switch virtual domain 1
Ruijie(config-vs-domain)# switch 2
```

switch virtual domain	VSU
switch *number* **priority** *priority_num*	VSU

show switch virtual

Gi 1/1/1 Gi 2/1/1 ӄ DADP
Ruijie(config)# **switch virtual domain** 1
Ruijie(config-vs-domain)# **dual-active detection dadp trust interface** *GigabitEthernet 1/1/1*
Ruijie(config-vs-domain)# **dual-active detection dadp trust interface** GigabitEthernet 2/1/1

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ÿ ӄ Â
Ruijie(config)# **switch virtual domain** *1*
Ruijie(config-vs-domain)# **switch** *1*
Ruijie(config-vs-domain)# **switch** *1* **priority** *200*
Ruijie(config-vs-domain)# **end**
Ruijie# **switch convert mode virtual**

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switch *num*	VSU Ʌ
switch virtual domain	VSU Ʌ
switch *number* **priority** *priority_num*	VSU ˝I
show switch virtual	Ʌ˘ ΠU ʌ Ʌ

ʌ

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10.4	ȝ

83.1.7 switch *num* priority

switch num priority ȝ VSU ˝I ˘ ȝ no ˝I Â

switch *num* **priority** *priority_num*

no switch *num* **priority**

num	VSU Ʌ

priority_num	VSU ″I ˘ ↓ 1 255

″I 100

٪ config-vs-domain

″I ˘ ″I Â

ў ˘ ″I ѝ ў Â

″I ˘ a ˘ Л∪ ∧ Â

```
#          1     ″I   ѝ 200
Ruijie(config)# switch virtual domain 1
Ruijie(config-vs-domain)# switch 1 priority 200
Ruijie(config-vs-domain)# exit
```

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٪	
show switch virtual	∧˘ Л∪ ∧ ∧

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10.4	٪

83.1.8 switch virtual domain

switch virtual domain ٪ VSU ∧˘ è no ∧ Â

switch virtual domain *number*

no switch virtual domain

number	VSU ∧

∧ 100

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```
#                 ᴖ ӥ 1
Ruijie(config)# switch virtual domain 1
Ruijie(config-vs-domain)#
```

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ঽ	
show switch virtual	ᴖ˘ ᴖᑌ ᴌ ᴖ

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10.4	ঽ

83.1.9 vslp interval

VSU ЮЎ **vslp interval** ঽ VSLP hello
˘ ᴌᴖᑌ **no** ঽ Â

vslp interval *milliseconds* **min_rx** *milliseconds* **multiplier** *multiplier-value*

no vslp interval *milliseconds* **min_rx** *milliseconds* **multiplier** *multiplier-value*

interval *milliseconds*	VSLP hello ˘ *milliseconds* ᴌ ӥ 200ms 5000ms Â
min_rx *milliseconds*	VSLP hello ˘ *milliseconds* ᴌ ӥ 200ms 10000ms Â
multiplier *multiplier-value*	˘ *multiplier-value* ᴌ ӥ 3 50 Â

ЮЎ ӥ 200msЎ ӥ 200msЎ ӥ 5 Â

ঽ config-vs-domain

VSLP hello Â

```
Ruijie(config)# switch virtual domain 1
Ruijie(config-vs-domain)# vslp interval 300 min_rx 300 multiplier
3
Ruijie(config-vs-domain)# exit
```

switch virtual domain	VSU ID

10.4(2b3)	

83.2

83.2.1 show switch id

show switch id

#

```
Ruijie#show switch id
```

```
DADP version: 1.0
Trusted interfaces configured:
Gi 1/1/1
Gi 1/2/1
Gi 2/1/1
Gi 2/2/1

#    IP BFD ৲ ў
Ruijie# show switch virtual dual-active bfd
BFD dual-active detection enabled: Yes
BFD dual-active interface pairs configured:
Gi 1/1/2
Gi 2/1/2
```

ৡ	
dual-active detection dadp trust interface *interface-name*	¸ DADP
dual-active detection bfd	¸ BFD ৲ ў
dual-active pair interface	¸ BFD

dual-activeep G!5BUðî¡—•›

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```
Ruijie# show switch virtual link
VSL Status : UP
VSL Uptime : 1 day, 4 hours, 29 minutes

Ruijie# show switch virtual link port
Port        State          Peer port    Rx         Tx
-----------------------------------------------------
Te 1/1/1    OPERATIONAL      Te 2/1/1    100000   100000
Te 1/1/2    LINK_DOWN                     0        0
```

ꢀ

ꢀ	
show switch virtual	VSU
show switch virtual role	ꢁ ꢂ ꢃ

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10.4	ꢀ

83.2.5 show switch virtual role

ꢁ ꢂ ꢃ

show switch virtual role

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Ruijie# **show switch virtual role**
Switch Switch Status Priority Role
 Number Oper(Conf)

LOCAL 1 UP 100(100) ACTIVE
REMOTE 2 UP 100(100) STANDBY

In dual-active recovery mode: No

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switch *num* **priority**	VSU ˮI
switch virtual domain	VSU ID
show switch virtual link	VSL

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10.4	ʒ

84

84.1

84.1.1 auto-sync

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84.1.2 auto-sync time-period

runing-config б startup-config Â

auto-sync time-period *value*

no auto-sync time-period

value	æ й

1 3600

standard

```
Ruijie(config)# redundancy
Ruijie(config-rdnd)# auto-sync time-period 60
Redundancy auto-sync time-period: enabled (60 seconds).
Ruijie(config-rdnd)# exit
```

84.1.3 redundancy

redundancy

redundancy

-	-

auto-sync auto-sync time-period switchover timeout

```
Ruijie# config terminal
Ruijie(config)# redundancy
Ruijie(config-rdnd)#
Ruijie(config-rdnd)# exit
```

-	-

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-	-

84.1.4 redundancy reload

privileged EXEC **redundancy reload** Slave Master Slave

redundancy reload {**peer** | **shelf**}

peer	Slave
shelf	Master Slave

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84.2

84.2.1 show redundancy auto-sync

ϫ Ϛ user EXEC privileged EXEC Ю show redundancy auto-sync ϡ ϫ Ϛ redundancy ╟ ϫ Â (έ Ⱶ auto-sync ϡ)

show redundancy auto-sync

-	-

ϧ

ϡ

```
Ruijie> enable
Ruijie# show redundancy auto-sync
Redundancy auto-sync mode: auto-sync standard.
...
```

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-	-

84.2.2 show redundancy state

ل ل user EXEC privileged EXEC ЮЎ show redundancy ل ل redundancy Â

show redundancy state

states	Master Slave

ы

ы

Ruijie> **enable**
Ruijie# **configure terminal**
Enter configuration commands, one per line. End with CNTL/Z.
Ruijie# **show redundancy states**
Redundancy stats:
my state = 19 -Active
peer state = 37 -Standby Hot
...

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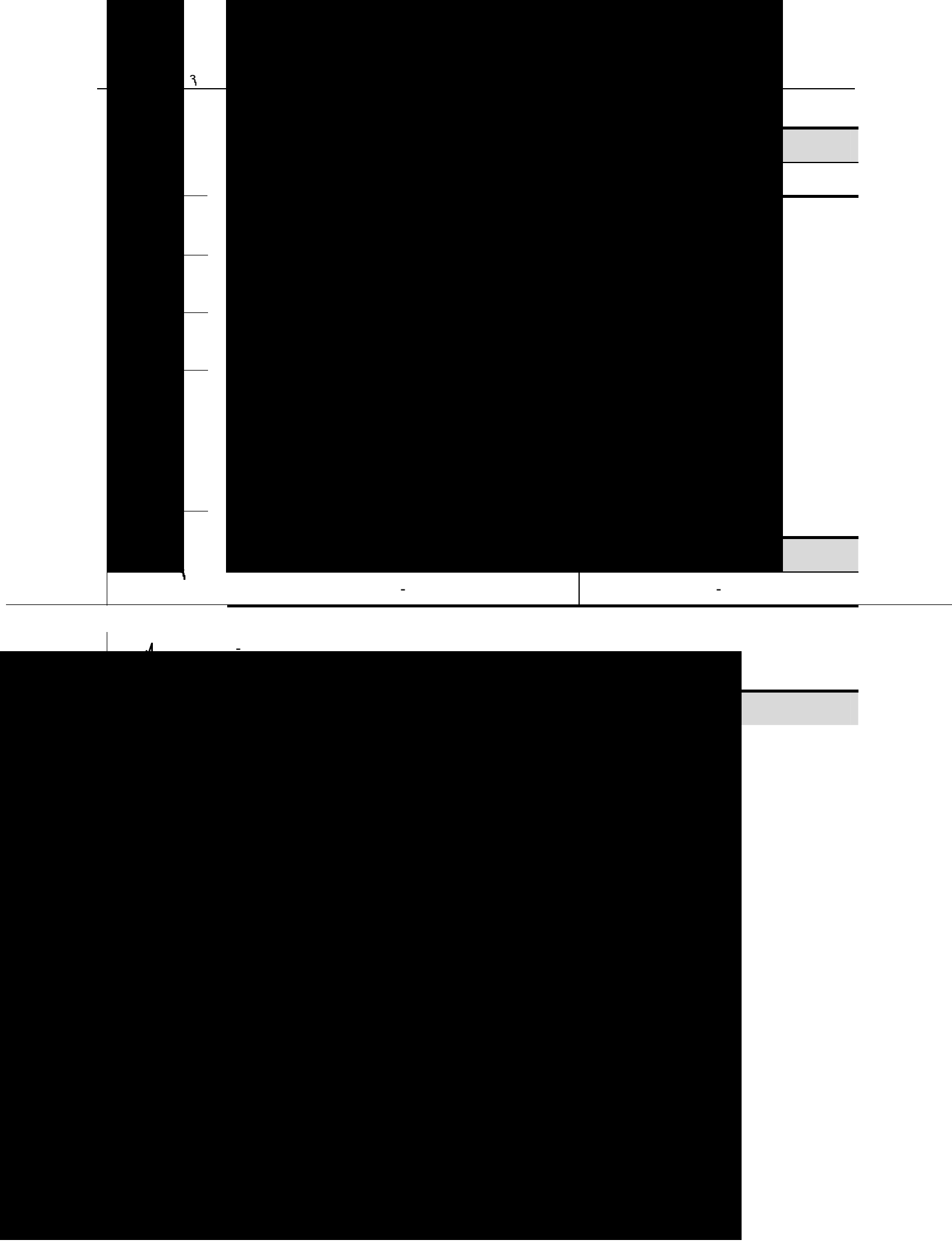
-	-

84.2.3 show redundancy switchtimeout

ل ل user EXEC privileged EXEC ЮЎ show redundancy switchtimeout ы ل ل redundancy switchover Â

show redundancy switchtimeout



85

85.1

85.1.1 cd

Â

cd [*filesystem:*][*directory*]

filesystem	Â
directory	

flash Ю

cd Â Â pwd Â

1' й usb0

```
Ruijie# cd usb0:/
```

pwd

10.4 2b3

VSU Ю sw1-m1-disk0:

1' ÿ tftp Ł ЭЮ

```
Ruijie#copy tftp://192.168.201.54/rgos.bin flash:/
```

2' Э tftp Ł

```
Ruijie#copy flash:/rgos.bin tftp://192.168.201.54/rgos.bin
```

3' xmodem Ю

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

4' U

```
Ruijie#copy flash:/config.text usb0:/config.text
```

5' ÿ

```
Ruijie#copy flash:/config.text slave:/config.text
```

del	
rename	
dir	

usb0:/ usb1:/ slave:/ url

a .

1
```
Ruijie# delete tmpfile
```
2
```
Ruijie# delete slave:/rgos.bin.bak
```

copy	
dir	

10.4 2b3	VSU sw1-m1-disk0:

85.1.4 dir

dir [*filesystem:*][*directory*]

filesystem	”:”
directory	

a .

1' ÿ Э

```
Ruijie# dir slave0:/
Directory of slave:/
   Mode Link     Size             MTime Name
-------- ---- --------- ------------------- ------------------
          1  10838016 2008-01-01 00:01:53 rgos.bin
          1      399 2008-01-01 00:01:37 config.text
          1      399 2008-01-01 00:17:58 cfg.txt
-----------------------------------------------------------------
```

…

mkdir *directory*

directory	

a , Â

Ruijie# **rmdir** *tmp*

mkdir	…

10.4 2b3	VSU sw1-m1-disk0:

85.2

85.2.1 pwd

pwd

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1' Ю Â

```
Ruijie# pwd
flash:/
```

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cd	˚

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85.2.2 show file systems

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show file systems

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˚ Э ˩ Â

1' ˚

Ruijie#**show file systems**

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86

86.1 CPU

86.1.1 cpu-log

CPU , ˩ Л **cpu-log** Â

cpu-*log* *log-limit low_num high_num*

log-limit	ʒ
low_num	CPU æ
high_num	CPU

Ю ѝ 100%˜ æ ѝ 90% Â

ʒ Â

ʒ ˩ Л CPU æ ˘ CPU Ю ˘ CPU , ˩ ' CPU æ æ Л , , CPU Ю ˘ ˩ CPU ˩ ѝ æ æ Â

Ю CPU æ ѝ 70%˜ CPU ѝ 80% Â

```
ruijie(config)# cpu-log log-limit 70 80
  CPU          80%       Ю    '
Oct 20 15:47:01 %SYSCHECK-5-CPU_USING_RATE: CPU utilization in one
minute : 95%˘ Using most cpu's task is ktimer : 94%
  CPU      æ  70%       Ю    '
Oct 20 15:47:01 %SYSCHECK-5-CPU_USING_RATE: CPU
utilization in one minute :68%˘ Using most cpu's task
is ktimer : 60%
Oct 20 15:47:01 %SYSCHECK-5-CPU_USING_RATE: The CPU
using rate has down!
```

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86.1.2 show cpu

U P C

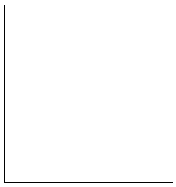
5	0%	0%	0%	waitqueue_process
6	0%	0%	0%	tasklet_task
7	0%	0%	0%	kevents
8	0%	0%	0%	snmpd
9	0%	0%	0%	snmp_trapd
10	0%	0%	0%	mtdblock
11	0%	0%	0%	gc_task
12	0%	0%	0%	Context
13	0%	0%	0%	kswapd
14	0%	0%	0%	bdflush
15	0%	0%	0%	kupdate
16	0%	3%	1%	ll_mt
17	0%	0%	0%	ll main process
18	0%	0%	0%	bridge_relay
19	0%	0%	0%	d1x_task
20	0%	0%	0%	secu_policy_task
21	0%	0%	0%	dhcpa_task
22	0%	0%	0%	dhcpsnp_task
23	0%	0%	0%	igmp_snp
24	0%	0%	0%	mstp_event
25	0%	0%	0%	GVRP_EVENT
26	0%	0%	0%	rldp_task
27	0%	2%	1%	rerp_task
28	0%	0%	0%	reup_event_handler
29	0%	0%	0%	tpp_task
30	0%	0%	0%	ip6timer
31	0%	0%	0%	rtadvd
32	0%	0%	0%	tnet6
33	2%	0%	0%	tnet
34	0%	0%	0%	Tarptime
35	0%	0%	0%	gra_arp
36	0%	0%	0%	Ttcptimer
37	8%	1%	0%	ef_res
38	0%	0%	0%	ef_rcv_msg
39	0%	0%	0%	ef_inconsistent_daemon
40	0%	0%	0%	ip6_tunnel_rcv_pkt
41	0%	0%	0%	res6t
42	0%	0%	0%	tunrt6
43	0%	0%	0%	ef6_rcv_msg

44	0%	0%	0%	ef6_inconsistent_daemon
45	0%	0%	0%	imid
46	0%	0%	0%	nsmd
47	0%	0%	0%	ripd
48	0%	0%	0%	ripngd
49	0%	0%	0%	ospfd
50	0%	0%	0%	ospf6d
51	0%	0%	0%	bgpd
52	0%	0%	0%	pimd
53	0%	0%	0%	pim6d
54	0%	0%	0%	pdmd
55	0%	0%	0%	dvmrpd
56	0%	0%	0%	vty_connect
57	0%	0%	0%	aaa_task
58	0%	0%	0%	Tlogtrap
59	0%	0%	0%	dhcp6c
60	0%	0%	0%	sntp_recv_task
61	0%	0%	0%	ntp_task
62	0%	0%	0%	sla_deamon
63	0%	3%	1%	track_daemon
64	0%	0%	0%	pbr_guard
65	0%	0%	0%	vrrpd
66	0%	0%	0%	psnpd
67	0%	0%	0%	igsnpd
68	0%	0%	0%	coa_recv
69	0%	0%	0%	co_oper
70	0%	0%	0%	co_mac
71	0%	0%	0%	radius_task
72	0%	0%	0%	tac+_acct_task
73	0%	0%	0%	tac+_task
74	0%	0%	0%	dhcpd_task
75	0%	0%	0%	dhcps_task
76	0%	0%	0%	dhcpping_task
77	0%	0%	0%	dhcpc_task
78	0%	0%	0%	uart_debug_file_task
79	0%	0%	0%	ssp_init_task
80	0%	0%	0%	rl_listen
81	0%	0%	0%	ikl_msg_operate_thread
82	0%	0%	0%	bcmDPC

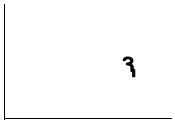
```
 83     0%     0%     0%    bcmL2X.0
 84     3%     3%     3%    bcmL2X.0
 85     0%     0%     0%    bcmCNTR.0
 86     0%     0%     0%    bcmTX
 87     0%     0%     0%    bcmXGS3AsyncTX
 88     0%     2%     1%    bcmLINK.0
 89     0%     0%     0%     bcmRX
 90     0%     0%     0%     mngpkt_rcv_thread
 91     0%     0%     0%     mngpkt_recycle_thread
 92     0%     0%     0%     stack_task
 93     0%     0%     0%     stack_disc_task
 94     0%     0%     0%     redun_sync_task
 95     0%     0%     0%     conf_dispatch_task
 96     0%     0%     0%     devprob_task
 97     0%     0%     0%     rdp_snd_thread
 98     0%     0%     0%     rdp_rcv_thread
 99     0%     0%     0%     rdp_slot_change_thread
100     4%     2%     1%     datapkt_rcv_thread
101     0%     0%     0%     keepalive_link_notify
102     0%     0%     0%     rerp_msg_recv_thread
103     0%     0%     0%     ip_scan_guard_task
104     0%     0%     0%     ssp_ipmc_hit_task
105     0%     0%     0%     ssp_ipmc_trap_task
106     0%     0%     0%     hw_err_snd_task
107     0%     0%     0%    rerp_packet_send_task
108     0%     0%     0%    idle_vlan_proc_thread
109     0%     0%     0%    cmic_pause_detect
110     1%     1%     1%    stat_get_and_send
111     0%     1%     0%    rl_con
112    75%    80%    90%     idle
```

Э ˘ 3 ˙ 5 à 1˙ à 5˙
CPU ˆ LISR à HISR ˫˜ ÂЮ ‡ ε CPU ˙
Â ε ˘ ЊЖ Ю'

No	Л
5Sec	˫ 5 CPU
1Min	˫ 1˙ CPU
5Min	˫ 5˙ CPU



ʒ 2 ˇ∫ LISR CPU HISR CPU
ˇ ÿ 3 ˇ Ł CPU Â Л idle CPU
ˇ Windows Ю Ї System Idle Process Ł ˇ Â Э
ˇ idle 5 CPU ѝ 75%˘ CPU 75% Â



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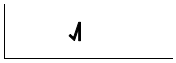

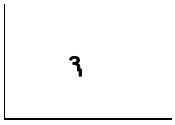

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86.2

86.2.1 memory-lack exit-policy

ʒ lower Л˘ Э ˇ Э BGP à OSPF à RIP à PIM-SM Â

memory-lack exit-policy (**bgp**|**ospf**|**pim-sm**|**rip**)

no memory-lack exit-policy

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bgp|ospf|pim-sm|rip	ѝ BGP OSPF PIM RIP Â
no	ѝ Â

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ϋ bgp Â

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1' ЛЮ ϋ BGP ϋ ″I Â

```
Ruijie(config)# memory-lack exit-policy bgp
```

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show memory	

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10.3(4b3)	ϡ

86.2.2 show memory

˘ ϡ **show memory** Â

show memory

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Ю **show memory** Â

```
Ruijie#show memory
System Memory Statistic:
```

Free pages: 1079

watermarks : min 379, lower 758, low 1137, high 1516

System Total Memory : 128MB, Current Free Memory : 5283KB

Used Rate : 96%

Э Ю

1. ˧ ˘ й 4k Â

2. ˘ Ю й

min a ˘ V ˛

87

87.1

87.1.1 clear logging

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clear logging

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Ю ă ʁ Â

```
Ruijie# clear logging
```

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logging on	
show logging	ă ʁ
logging buffered	ă ʁ

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87.1.2 more flash

FLASH ˚ ˘ Ю ϟ'

more flash:filename

Filename '	˚ ɻ

FLASH ˚ ˚ ɻ ”//f2/˝ ”//f3/’ ˚ Â ϡ ϰ
˚ ˘ a ϡ è ˚ Â

Ю FLASH ˚ '

```
Ruijie# more flash://f2/log.txt
look up file in the extended flash://f2/log.txt
00004 2004-11-17 4:1:32 Ruijie: %5:Reload requested by
Administrator. Reload Reason :Reload command
```

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logging file flash:	FLASH Э

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87.1.3 logging buffered

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ϡ Â ϡ no ă ʁ Â ϡ default
ă ʁ й Â

logging buffered [*buffer-size* | *level*]

no logging buffered

default logging buffered

buffer-size	ă ʁ ˘ ϰ ÿ 4K 128K Bytes Â

levell	ш ˘ ÿ 0 7 Â ⅃ Л ⅄ ˘ ≠ ⅃ Л ⅄ Â

ă ѡ ѝ 4k Bytes Â
ш ѝ 7 Â

ҁ

ă ѡ ˘ ѡ ˘ ‡
Â ă ѡ ˘ ҁ **show logging Â**
ă ѡ ˘ ҁ clear logging˘
ă ѡ Â ˘ FLASH
Syslog Server Â
ǂ ѝ ЛЮ 8 '

Emergencies	0	˘ a
Alerts	1	⅄
Critical	2	
Errors	3	
warnings	4	
Notifications	5	˘ a
informational	6	
Debugging	7	

˘ ˘ 0 Â
Л ⅄˘ æ
Â

Ю ⅄ ѝ 6 Л æ 6 ѝ 10000
ă ѡ '

```
Ruijie(config)# logging buffered 10000 6
```

ҁ	
logging on	
show logging	ă ѡ
clear logging	ă ѡ

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87.1.4 logging console

⁸ ʃ Э ˘ Ю ʒ Â ʒ no
⁸ ʃ Э Â

logging console *level*

no logging console

level	ш ˘ ÿ 0 7 Â ʃ Л ʃ ˘ ≠ ʃ Л Â ш ˘ 1 Â

Debugging (7)

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⁸ ʃ Э Â

show logging ʒ ʃ Л Â

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`Ruijie(config)#` **`logging console informational`**

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logging on	
show logging	ă ʊ ˘ Л

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87.1.5 logging count

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no Â

logging count

no logging count

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Â ÿ Â **no logging count** Â

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```
Ruijie(config)# logging count
```

show logging count	
show logging	б ă ш

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87.1.6 logging facility

Ю Â Â no

й (23) Â

logging facility *facility-type*

no logging facility

facility-type	Syslog ˘ é Â

Local7(23)

ÞO ˆ 2˜ Syslog ˩ '

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)

й (local7) 23 Â

Ю Syslog й kernel

```
Ruijie(config)# logging facility kern
```

	FLASHЋ Л FLASHЋ FLASHЋ logging file flash ╠ ˘ a Â

Ю FLASH ˘ ˚ Ы ѝ trace.txtЋ ˚ ѝ 64K, ѝ 6 Â

```
Ruijie(config)# logging file flash:trace
```

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logging on	
show logging	ă Ѡ ˘ Л
more flash	FLASH

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87.1.8 logging monitor

VTY ^ telnet à SSH ~ Э ˘
Ю ϡ Â ϡ no VTY Э Â

logging monitor *level*

no logging monitor

level	ш Â Л Л ы ˘ ≠ Л Л Â ш ˘ 1 Â

Debugging (7)

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VTY Э ˘ ″I ϡ **terminal monitor**
VTY Â ‡ **logging monitor** Н Â
Logging monitor Н VTY Â

Ю VTY Э й б

```
Ruijie(config)# logging monitor informational
```

logging on	
show logging	ă ш ˘ Л

logging	Syslog Server
logging file flash:	FLASH Э
logging console	⁸ Л Э
logging monitor	VTY (telnet) Э
logging trap	Syslog Server

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87.1.10 logging rate-limit

⁸ Ш ˘ ⁸ ˘ Ю

Â ⁸ Ш ˘ no Â

logging rate-limit {*number* | *all number* | *console* {*number* | *all number*}} [*except severity*]

no logging rate-limit

number	˘ й 1—10000
all	⁸˘ 0—7 ,
console	⁸ Л Э ’
except	ш ˘ a ⁸’ й error(3)˘ error a ⁸’
severity	ш ˘ ˘ ш ˘ й 0—7

Ю˘ a ⁸ Â

Â ⁸ Â Â˘ Л Л Â

ˆ debug˜ й 10 ˇ warning ш

a 8'

```
Ruijie(config)#logging rate-limit all 10 except warnings
```

2' Ю IPV6 ѝ AAAA:BBBB::FFFF

```
Ruijie(config)# logging server ipv6 AAAA:BBBB::FFFF
```

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logging on	
show logging	ă ѡ ˘ Л
logging trap	syslog server

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87.1.12 logging source ip| ipv6

˘ Ю ʒ Â ʒ no ʌ

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logging source {**ip** *ip-address* | **ipv6** *ipv6-address*}

no logging source {**ip** | **ipv6**}

ip-address	IPV4 ў IPV4 '
ipv6-address	IPV6 ў IPV6 '

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Ю˘ Syslog Server Â ѝ

˘ ʌ Л ʒ ѝ ˘

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Ю Loopback 0 ѝ Syslog '

```
Ruijie(config)# logging source ip 192.168.1.1
```

3	
logging	Syslog server

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87.1.14 logging synchronous

logging synchronous

no logging synchronous

-	-

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Ruijie(config)#**line console** *0*
Ruijie(config-line)#logging synchronous
UP-DOWN
Ruijie#**configue terminal**
Oct 9 23:40:55 %LINK-5-CHANGED: Interface GigabitEthernet 0/1, changed state to down
Oct 9 23:40:55 %LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet 0/1, changed state to DOWN
Ruijie# **configue terminal** //

show running-config	

-	-

87.1.15 logging trap

Syslog Server Ю

no Syslog Server

logging trap *level*

no logging trap

level	1

Informational(6)

Syslog Server logging Syslog Server logging trap **show logging**

Ю 6 202.101.11.22 Syslog Server

```
Ruijie(config)# logging 202.101.11.22
Ruijie(config)# logging trap informational
```

logging on	
logging	Syslog Server
show logging	

-	-

87.1.16 service sequence-numbers

Ю no

service sequence-numbers

no service sequence-numbers

-	-

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╗ Э Л Л˘ ┘Л ˘ Л ˝І Л Â

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```
Ruijie(config)# service sequence-numbers
```

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Ю ╗ Э ˩'

```
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
Mar 22 15:35:57 S3250 %SYS-5-CONFIG: Configured from console by
console
```

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show logging	б ᾰ ᴡ

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87.1.18 service timestamps

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msec	˘ ' :¦ : . ' Jul 27 16:53:07.299
year	˘ ' ' ¦ ' ' 2007 Jul 27 16:53:07

˘ й Â RTC˝ ‡ ╟ й ╟
Â

Uptime ÿ Э ╟ ˘ Æ й Â
Datetime й ˘ · · ' ¦ ' Â

Ю Log Debug ˘ й

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ЮЎ VTY Э a Â

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Ю ˘ VTY Â

```
Ruijie# terminal monitor
```

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87.2

87.2.1 show logging

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show logging

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Ю **show logging** '

```
Ruijie# show logging
Syslog logging: enabled
Console logging: level debugging, 4 messages logged
Monitor logging: level informational, 0 messages logged
Buffer logging: level debugging, 6 messages logged
Timestamp debug messages: datetime
Timestamp log messages: disabled
Sequence log messages: enable
Trap logging: level debugging, 2 message lines logged,0 reserved,0 fail
logging to  202.101.11.22
logging to  192.168.200.112
Log Buffer (Total 4096 Bytes) : have written 680
00001 2004-11-17 10:20:59  Ruijie: %7:%LINK CHANGED: Interface FastEthernet 0/0, changed state to up
00002 2004-11-17 10:20:59  Ruijie: %7:%LINE PROTOCOL CHANGE: Interface FastEthernet 0/0, changed state to UP
00003 2004-11-17 10:57:18  Ruijie: %7:%LINK CHANGED: Interface FastEthernet 0/1, changed state to administratively down
00004 2004-11-17 10:57:21  Ruijie: %7:%LINK CHANGED: Interface FastEthernet 0/1, changed state to down
00005 2004-11-17 10:57:41  Ruijie: %7:%LINK CHANGED: Interface FastEthernet 0/1, changed state to administratively down
00006 2004-11-17 10:57:43  Ruijie: %7:%LINK CHANGED: Interface FastEthernet 0/1, changed state to down
```

'

Syslog logging	' **enabled**, **disabled**
Console logging	⁸ ⅄ Э ˘ Л
Monitor logging	VTY Э ˘ Л
Buffer logging	ă ʁ ˘ Л
Timestamp debug messages	Debug
Timestamp log messages	Log
Sequence log messages	/ı

Trap logging

logging count	ㄲ
show logging	б ă ш
clear logging	ă ш

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88

88.1

88.1.1 install slot-num moduletype

slot-num	
moduletype	

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2 Э 24SFP/12GT

```
Ruijie# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)# install 2 24SFP/12GT
2006-04-22 09:26:00  @5-CONFIG:Configured from outband
Ruijie(config)# end
Ruijie# show version module detail 2
Device  : 1
Slot    : 2
User Status  : installed
Software Status: none
Online Module :
Type    :
Ports   : 0
Version :
Configured Module :
Type    : M8606-24SFP/12GT
Ports   : 24
```

```
Type    :
Ports   : 0
Version :
Configured Module :
Type    :
Ports   :
Version :
```

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88.1.4 reset module slot-num

slot-num	/ı

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Ruijie# **reset module** *4*

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88.2

88.2.1 show version module detail [module-num]

module-num	/ı˘ ˩

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```
Ruijie# show version module detail 2
Device  : 1
Slot    : 2
User Status :    none
Software Status:  none
Online Module :
Type    :
Ports   : 0
Version :
Configured Module :
Type    :
Ports   :
Version :
```

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show version slots	

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88.2.2 show version slots [slot-num]

num	ʃ˘ ɻ Â

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Software Status ˘ й OK

```
Ruijie# show version slots
Dev Slot  Configured Module Online Module  User Status   Software
Status
--- ----  -----------------   -----  --------------
1 1    none          none
1 2 M8606-24SFP/12GT M8606-24SFP/12GT installed none
1 3 M8606-2XFP M8606-2XFP uninstalled  cannot startup
1 4 M8606-24GT/12SFP M8606-24GT/12SFP installed ok
1 M1 M8606-CM  M8606-CM              master
1  M2                                 none
```

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show version moduel detail	

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89

89.1

89.1.1 lcd trap-number num

lcd trap-number *num*

	num	1-100 Â

num ѝ 80Â

ʔ ʔ Â

num ѝ 80 ‡ **show running-config** a **memory-rate rising-threshold** *80Â*

```
Ruijie(config)# memory-rate rising-threshold 60
```

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90.1.2 usb remove

usb remove *device-id*

device-id	٭ ٨ Â б URL USB ٬ Â usb0 ٨ 0

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USB ˘ ٩ ˘ Л Â
Т˘ ˘ ٬ Â ˘
USB ˘ ‡ Ѧ Â

Ю ٭ Э USB Â

```
Ruijie# usb remove 0
OK, now you can pull out the device in usb0.
*Jan  1 00:18:16: %USB-5-USB_DISK_REMOVED: USB Disk <Mass Storage>
has been removed from USB port 0!
```

٬Л USB Â

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91 POE

91.1

91.1.1 Poe disconnect-mode mode/no poe disconnect-mode

mode	й ˘ [ac/dc]

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Ю ٦ ٨ Л

POE й dc

```
Ruijie# configure
Ruijie(config)# poe disconnect-mode dc
Ruijie(config)# end
```

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91.1.2 Poe enable/no poe enable

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```
Ruijie(config-if)#
Ruijie(config-if)# poe enable
Ruijie(config-if)# no poe enable
Ruijie(config-if)#
```

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91.1.3 Poe-power lower lower/no poe-power lower

lower	ӥ ˘ [45000-47000] Â

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POE ӥ 46000

```
Ruijie# configure
Ruijie(config)# poe-power lower 46000
Ruijie(config)# end
```

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91.1.4 Poe-power upper lower/no poe-power upper

upper

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ৡ ৶ Л∪ POE Â

```
Ruijie# show poe powersupply
PSE Total Power : 379971 mW
PSE Total Power Consumption : 0 mW
PSE Available Power : 379971 mW
PSE Peak Value : 0 mW
PSE Min Allow Voltage : 45000 mV
PSE Max Allow Voltage : 57000 mV
PSE Disconnect Sense Mode : ac
```

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